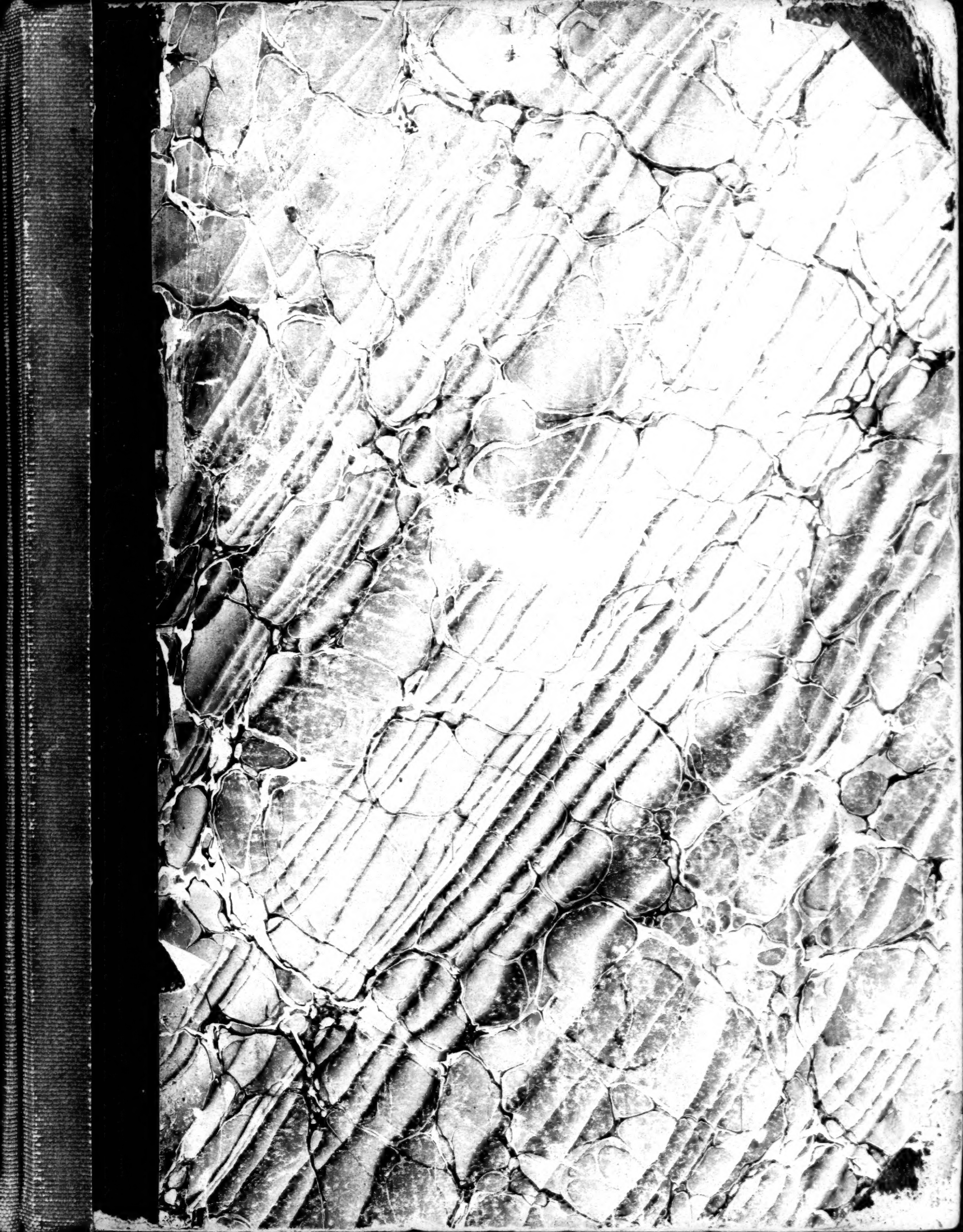


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Saturday, January, 1850.

Lead Ores of the United States.

Though almost the only mines now wrought for lead are in the States bordering the Mississippi river, ores of this metal are of frequent occurrence in small quantity in all parts of the country, and they have in various places led to large expenditures of capital which has rarely been returned. It is a singular fact that there are more ancient traditions respecting *lead mines* current in every part of the country, than of any other mines; and there are few places where these traditions have not led to or encouraged idle search for productive veins. "The Indians," one is told, "used to dig lead ore in this neighborhood," and the same story is repeated with little variation in every town from Passamaquoddy bay to the mouth of the Mississippi; and this notwithstanding the Indians rarely knew its use or how to smelt the ore. It would be of great service to those credulous persons, who put confidence in such vague traditions, if they would impress upon their minds this great principle respecting the occurrence of workable veins of any of the ores, viz: that they seldom if ever occur isolated; but when a rich mine is known of any ore others are also found in its immediate neighborhood. Hence the chances

are always extremely small in a country long inhabited, of discovering rich mines of metals, for which the region around has not before been famous.

Still the sulphuret of lead, like the sulphuret of iron, is an ore often found in small quantities both in the stratified and unstratified rocks, and I might cite and describe various localities in the New England and Middle States, where attempts have been made to work it; but I propose to select only a few of these, such as have given the greatest promise of success, and which, though now abandoned for mining purposes, may still at some future day call forth new enterprises.

The only ores worked in the United States are the sulphuret or galena and the carbonate of lead; the former is the common variety of lead ore, and is usually found associated with sulphuret of zinc or blende and carbonate of zinc or calamine and sulphuret of iron. Galena, when pure contains 86.55 per cent. of lead; the rest is sulphur, which driven off by a slow heat leaves the lead in a metallic state. The galena found in the primary rocks contains most frequently a small portion of native silver, and is then called argentiferous; the galena found in the limestones of the western States has no appreciable quantity of silver.

Of the New England mines that at *Shelburne*, N. Hampshire, has been the most promising; and in New York the *Rossie Lead Mine* in the unstratified rocks of St. Lawrence county; and the *Shawangunk Mine* in the stratified rocks of the Hudson river.

SHELBERNE LEAD MINE.

Though the existence of metallic ores has been long known in the region of the White mountains, little has yet been done to determine their importance. At an early period the iron mines of Franconia attracted more attention than they warranted, and the smelting of the magnetic ores from the small veins there found has since been followed with singular perseverance considering the utter unprofitableness of the operation. The want of success here may have discouraged the prosecution of other mining enterprises in this region; and so caused to be neglected the more promising resources, which it undoubtedly possessed. The geological survey of the State of New Hampshire, conducted by Dr. C. T. Jackson, has served to bring forward these resources to public notice, and to render it highly probable that the region will one day become an important mining district. The

enormous *iron ore* beds of *Jackson & Bartlett*, the *tin ore* vein of the same vicinity, the *copper ores* of *Warren*, the *lead and zinc ores* of *Eaton*, of *Parsonsfield* in Maine, and of *Shelburne* encourage the hope that when these resources shall have been properly investigated, the region may prove in importance not unlike some of those older mining districts in Europe, which it now resembles in its external features and geological formations.

The *Shelburne Lead Mine* is situated in the hills a mile north of the valley of the Androscoggin four miles from the State line. Mt. Washington lies sixteen miles to the southwest, the principal summit of the White mountains. Mt. Lafayette and other high peaks grouped around constitute the great central mass of these mountains and of the granitic formations of N. Hampshire and Maine. The Androscoggin river winds its way among the high hills down to the sea, and its valley affords the most feasible route for the railroad now in progress from Montreal to Portland. This passes within two miles of the mine at the distance of seventy-five miles from Portland, and if the mine should prove to be workable will be of no small consequence in the transportation of its products.

The vein is opened on the banks of a small tributary to the Androscoggin, called Lead river. On each side the hills of micaceous slates rise from 800 to 1000 feet in height, the strata lying north and south. Across these a great vein of quartz, from 10 to 25 feet in width, pursues its course in an east and west direction passing through the hills on each side; and in another ravine more than two miles to the west it is again met with, presenting the same characteristics of size and structure. This large vein consists for the most part of small quartz veins, all which pursue the same east and west course and dip together to the north at an angle of 71°. Interspersed with the quartz are seams of brown spar and calcareous spar, and on the north side near the upper wall small streaks of metallic ores are seen at the surface. These appear quite insignificant, not exceeding an inch or two in thickness. They consist of argentiferous galena principally; and associated with it are the sulphurites of zinc, copper and iron.

The highly argentiferous character of this ore having been discovered many years ago, attempts were made to work the mine, but the enterprise was soon abandoned. It remained neglected until June, 1846, when A. Colby, Esq., commenced reg-

ular mining operations, employing a force of ten hands. With these the work was vigorously prosecuted until the last summer, when it was suspended, probably to be renewed at a future day. Three shafts were sunk on the vein, and an adit level driven into the hill seventy feet in length. The main working shaft was carried down 268 feet, and a steam engine was employed to raise the water, which at times was quite troublesome. The eastern shaft was sunk to the depth of 80 feet, and the western 60 feet. Some short levels were run and the vein was stoped out in one place for about 30 feet in height. In all these workings the little seams of galena were traced without interruption, keeping near the north wall of the main vein.—They sometimes swelled out to a thickness of twenty inches of good ore, and then contracted again to their close dimensions at the surface. The richest spot was at the depth of 65 feet, nothing below was found to compare at all with the thickness of the lode at this point. The ore extracted from this nest was a mixture of fibrous with granular and crystalline galena associated with more or less copper and iron pyrites and black blende in the matrix of quartz crystals and brown spar. The "vugs" or cavities in the vein furnished some of the most beautiful groups of these crystals I have ever seen from any mines. The clusters of the different sulphurets are remarkable for the size and perfect form of the crystals, while they strike the eye by the variety of color and lustre, the brilliant jet black of the blende making a perfect contrast with the unsullied whiteness of the rock crystal in which it lies, and the silvery lustre of the galena vying with the golden hue of the copper pyrites by its side. Even the famed specimens from the Rossie mine are surpassed in beauty by those from Shelburne.

In the Report of the Geological Survey of New Hampshire Dr. Jackson describes this ore as yielding three pounds of silver to the ton. Some analyses forwarded to me by A. A. Hayes, gave lbs. 3.2; lbs. 3.6; lbs. 6.477 and lbs. 7.53 of silver to the ton of argentiferous lead, which he extracted from large samples of several hundred pounds of the ore. From a portion of the washings which I took from the stamping mill at the mine in December, 1847, I extracted 73.75 per cent. of silver lead, which by cupelling, gave at the rate of lbs. 4.7 of silver to the ton of metal or lbs. 3.47 to the ton of ore. The value of this metal would be at \$4 per 100 lbs. for the lead—\$80; and for 3½ lbs. of silver at \$20 per lb.—\$70: making the total value per ton \$150.—Contracts to extract the silver were offered at six dollars per ton of lead operated upon, the contractor to take the lead at the market price, and return the whole amount of silver.

The discovery of the large pods of ore in 1846, and the general favorable appearance of the lode, accompanied as it was with the seams of flucan and with every flattering indication of large quantities of galena, seemed to warrant the construction of a smelting furnace and machinery for stamping and cleaning the ores. These were built on excellent water power close to the mine, the furnace being constructed after the Scotch plan of lead furnaces; and all built in the most thorough and workmanlike manner.

Though the proprietors have their subsequent ill-success to discourage them, as well as the uncertain character of this region for the production of other ores than those of iron, they are still aware that the work has not been prosecuted sufficiently far to be decisive; it would not be regarded so where

the best veins of argentiferous galena are wrought in other countries. And as this vein is proved to be of enormous extent, and is traced over several miles of surface, the title to which is held by the same proprietors, it is certainly an object of great consequence to subject the matter to a thorough trial. The result, whether successful or not, will be a benefit to this section of the country, as it will tend to determine whether all the other veins of argentiferous galena scattered in various towns around are to be regarded as of any value or not.

At Eaton in the same vicinity is a large vein of sulphuret of zinc containing a vein of galena eight inches in width. The following account of this ore is taken from a report by A. A. Hayes, Esq., of April, 1846.

No. 1. A sample of 290 lbs. consisting of galena and blende with rock gangue. The whole was reduced to powder to furnish the sample. "The intimate mixture of the blende indicated that this ore was taken from the surface or part of the vein where, from natural causes, the galena had not assumed its distinct place."

The assay sample afforded 422 parts of silver lead in 1000, and some minute particles remained in the flux; another gave 430 parts. This is the extent that smelting on the large scale can give.

"Silver lead obtained from this ore is sensibly harder than soft lead, and exhibits a tendency to crystallize in large crystals. It is free from copper, iron and zinc, containing only silver (lead) and traces of sulphur.

The assays of the silver lead conducted on samples representing one ton of silver lead afforded an average return of 7.536 lbs. of pure silver."

No. 2. A sample of 300 lbs. treated as before afforded 446.5 parts in 1000 of silver lead; a second 463 parts. This lead afforded 6.477 lbs. of pure silver.

"Two points of prominent interest present themselves on considering the results of these assays.—One is, whether the reducing operations do or do not extract all the silver of the ore in combination with the lead rendered. This question experiment has affirmatively answered; no silver remains in the unreduced mixture of flux and zinc ores.

The other is, that in a mixture of the ores of lead and zinc, it is well known that smelting operations are never very perfect, and the lead is extracted with difficulty; will the lead resulting from imperfect operations still contain all the silver of the ore? It has been ascertained that all the silver will be retained by the lead, when even one half of the lead remains from the smelting operations; and as a matter of economy it may be advisable to extract only a large proportion of the lead from the ore, without incurring the greater expense of perfect operations, thereby insuring a richer silver lead at a less expense in the production."

The ore from Parsonsfield, Maine, in this same region, also contains a considerable portion of silver, but less than that of Shelburne.

A specimen of galena was put into my hands some time since from Uxbridge, Mass., which was stated to be highly argentiferous. I reduced it and then expelled the lead, and obtained from it at the extraordinary and I believe unequalled rate of 13.53 lbs. troy to the ton of galena. I am informed there are several small veins of the ore found in hard sandstone, adjoining limestone. A shaft has been sunk sixty feet into the limestone, but the veins were lost; the quantity where the vein showed the best was very small.

The least amount of silver in the ton of silver

lead, which it is profitable to extract is by the lately discovered process of parting by crystallization as small as three ounces. Before this no lead was treated for silver, that did not contain about nine ounces per ton. The lead ores of Cornwall and Devonshire, England, are generally argentiferous, and have furnished silver for centuries past. Among the richest are the lodes of Bear Alston, which have produced large quantities of ore, often containing from 80 to 120 ounces of silver per ton of lead. The greatest quantity, which occurred in that part of them named the South Hooe mine, was 140.02 of silver per ton of lead. In 1784 and 1785 the silver produce of these mines amounted to 6,500 ounces. The ore of Garras near Truro produced in 1720 about 100 ounces of silver to the ton of lead. In 1814 the mine was re-opened and worked two years, producing in this time 800 tons of ore, containing 13 parts in 20 of lead, the lead yielding 70 ounces of silver per ton. Wheal Pool near Helston, about 1790 yielded from 40 to 50 ounces of silver per ton of lead—Wheal Rose 60 ounces of silver.*

In the next number I will describe the process of separating by crystallization, leaving the description of smelting the ores to accompany the account of the Wisconsin mines. H.

THE POISON OF THE VIPER.

The poison of the viper consists of a yellowish liquid secreted in a glandular structure, (situated immediately below the skin on either side of the head,) which is believed to represent the parotid gland of the higher animals. If a viper be made to bite something solid, so as to void its poison, the following are the appearances under the microscope:—At first nothing is seen but a parcel of salts nimbly floating in the liquor, but in a very short time, these saline particles shoot out into crystals of incredible tenuity and sharpness, with something like knots here and there, from which these crystals seem to proceed, so that the whole texture in a manner represents a spider's web, though infinitely finer and more minute. These spiculae or darts, will remain unaltered on the glass for some months. Five or six grains of this viperine poison, mixed with half an ounce of human blood, received in a warm glass, produce no visible effects, either in color or consistence, nor do portions of this poisoned blood, mixed with acids or alkalis, exhibit any alterations. When placed on the tongue, the taste is sharp and acrid, as if the tongue had been struck with something scalding or burning; but this sensation goes off in two or three hours. There are only five cases on record of death following the bite of the viper; and it has been observed that the effects are most virulent when the poison has been received on the extremities, particularly the fingers and toes, at which parts the animal, when irritated, (as it were by an innate instinct,) always takes its aim.—F. T. Buckland.

EAST INDIA FINANCES.

The public are, we believe, aware that the Government of India is just now in the position of a good many of its faithful subjects—that is, its disbursements exceed its income, and it is obliged to cast about for the means (to use a popular phrase) of "making both ends meet." The depletion in the national treasury has not only been broadly disclosed by published accounts, but it has been indicated by certain characteristic symptoms, of which the principal is a tendency on the part of the authorities to cut down the emoluments of the lower grades of public servants. Out of this state of things, a very important question has necessarily arisen—how is the existing deficiency to be remedied? Is the revenue susceptible of material enhancement, or will it be requisite to decrease the charges? Must the people be taxed to support the government, or are expenses of the State capable of such further reduction as to meet the deficiency complained of?

* See Geological Report of Cornwall, Devon and West Somerset by H. T. De La Beche, p. 611.

The East India Company's accounts for the last four years have been published by order of Parliament, and a contemporary, we observe, quotes from them the following "general balance":—

	1844-45.	1845-46.	1846-47.	1847-48.
Exp...	18,036,819	18,307,795	19,624,347	18,635,329
Inc...	17,293,305	17,112,419	18,653,145	17,619,391
Defic.	743,514	1,495,376	971,202	1,015,938

Taking the deficit of a million sterling annually as a real and tangible thing, and considering that by the annexation of the Punjab and the guarantee to the Railway Companies, it is likely to be, temporarily, very materially increased, the point for discussion is, how can government best arrange its finances, so as to surmount the great practical difficulty and annoyance presented by the deficiency in question?—*Irish Railway Gaz.*

Trade and Commerce of the Canals.

Up freights have ruled very steady. Contracts made early in the season paid the shipper much better than engagements entered into during the summer, and the fall contracts were about the same as those made in the spring. The general opinion of those engaged in this branch of business is, that but little money has been made by forwarding merchants, and that unlike 1847, the farmers alone have reaped the golden harvest, and all that is left to the forwarder for his toil and labor, is the satisfaction of having discharged his duty faithfully and honestly.

Notwithstanding business has been deranged by the existence of the cholera, the annexed figures show that the past season has but one equal in the history of our State canals; and that year can scarcely be taken as a criterion for others, we allude to the ever memorable 1847, when the foreign demand for all kinds of grain and breadstuffs were such as to call into requisition everything that would float, either on the lake, river or canal. Such a season as that was, can only be looked for once in twenty years, and should it occur more than once within that period, it would be unlooked for.

A reduction of tolls was made last winter by the Canal Board on corn and iron. This has doubtless tended to increase the shipments of these great articles of export, but notwithstanding this reduction, the tolls received this year are greater than that of any other season since 1847.

The number of boats navigating the canals this season, is estimated at about 4,500, some of them made only one trip, while others continued in motion during the season. Of this number, about 2,500 boats were run on individual account, and the remainder belong to, or were chartered by regular lines.—*Even Jour.*

STATEMENT showing the total quantity of each article which came to the Hudson River, on all the canals, during the years 1847, 1848, and 1849:

THE FOREST.	1847.	1848.	1849.
Fur and peltry, lbs.....	556,000	556,816	554,531

PRODUCT OF WOOD.	1847.	1848.	1849.
Boards & scant...	299,078,633	262,279,116	297,431,140

Shingles, M...	101,527	104,270	51,258
Timber, c. ft...	1,613,943	1,510,777	1,497,627
Staves, lbs...	95,104,000	114,246,000	154,159,369
Wood, cords...	13,331	13,851	11,977
Ashes, bbls...	37,538	38,229	25,490

AGRICULTURE.

PRODUCT OF ANIMALS.	1847.	1848.	1849.
Pork, bbls.....	76,179	87,930	79,985

Beef, ".....	71,266	60,570	105,419
Bacon, lbs.....	4,902,000	8,182,000	8,577,754
Cheese, ".....	40,844,000	43,280,000	42,097,818

Butter, ".....	22,724,000	23,730,000	20,880,409
Lard, ".....	4,348,000	9,926,000	9,083,062
Wool, ".....	12,044,000	8,534,000	12,731,402
Hides, ".....	172,000	176,000	596,364

VEGETABLE FOOD.

Flour, bbls....	3,952,972	3,131,095	3,263,087
Wheat, bush...	4,143,830	9,116,134	2,734,389
Rye, ".....	295,119	286,919	322,942

Corn, ".....	6,053,845	2,933,964	5,121,270
Barley, ".....	1,523,020	1,548,197	1,400,194
Other grain bu.	2,040,052	2,077,724	2,407,895

Ship stuffs, "...	2,093,681	1,437,487	2,032,031
Peas & beans...	106,088	75,808	160,234
Potatoes, ".....	108,369	115,629	242,211
Dried fruit, lbs	3,556,000	1,828,000	780,369

ALL OTHER AGRICULTURAL PRODUCTS.

Cotton, lbs...	474,000	174,400	316,094
Tobacco, "...	1,228,000	352,000	1,796,056
Grass seed "...	3,308,000	1,666,000	2,479,098
Flax seed, "...	4,128,000	1,764,000	1,381,684
Hops, ".....	1,948,000	1,598,000	1,877,805

MANUFACTURES.

Domestic spirits, gals....	1,693,076	1,606,131	2,107,590
Leather, lbs....	5,168,000	4,540,000	5,532,610
Furniture, lbs....	1,972,000	1,548,000	1,116,300
Br & pg lead lbs...	482,000	86,000	11,167
Blm & bar iron...	26,348,000	11,528,000	27,906,016

Pig iron, lbs....	21,608,000	29,788,000	9,636,166
Iron ware, lbs....	3,014,000	2,314,000	1,737,690
Domes woollens...	1,756,000	1,104,000	1,055,519
Domes cottons...	2,396,090	2,468,010	2,498,425
Salt, bush.....	382,390	343,618	283,333

OTHER ARTICLES.

Stone, lime, &c...	59,094,000	65,246,000	56,477,071
Gypsum, lbs....	8,513,000	3,718,000	2,551,600
Mine'l coal lbs...	32,580,000	48,292,000	25,169,939
Sundries.....	147,988,000	97,798,000	111,810,700

STATEMENT showing the aggregate, in tons, under the divisions specified in the above table:

	1847.	1848.	1849.
The Forest, tons	666,113	603,272	664,117
Agriculture, "...	897,717	684,896	769,002
Manufactures...	51,532	44,867	44,236
Merchandise...	4,831	6,343	5,872
Other articles...	124,090	107,527	95,195

Total tons.....	1,744,283	1,447,905	1,580,072
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STATEMENT showing the estimated value of each article which came to the Hudson River, on all the canals, during the years 1847, 1848, and 1849:

THE FOREST.

Fur and peltry, \$590,150	\$695,838	\$692,864
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PRODUCT OF WOOD.

Board & scant...	5,078,564	3,931,277	4,459,158
Shingles, M...	406,548	388,861	153,774
Timber, c. feet...	169,160	212,598	119,608
Staves, lbs....	1,239,677	514,109	693,702
Wood, cords...	79,986	69,463	56,892
Ashes, bbls....	1,135,288	1,146,890	479,675

AGRICULTURE.

PRODUCT OF ANIMALS.

Pork, bbls.....	1,104,673	967,230	758,421
Beef, ".....	718,349	505,700	1,244,360
Bacon, lbs....	416,738	490,997	514,665
Cheese, ".....	2,860,354	3,029,169	2,736,212
Butter, ".....	3,408,751	3,359,391	2,923,831
Lard, ".....	434,780	761,757	635,814
Wool, ".....	3,599,963	2,304,044	4,072,358
Hides, ".....	21,611	19,494	59,636

VEGETABLE FOOD.

Flour, bbls....	27,057,037	17,471,401	18,315,455
Wheat, bush...	5,833,901	3,677,020	2,993,161
Rye, ".....	259,940	200,310	187,545
Corn, ".....	5,179,970	1,834,388	2,970,482
Barley, ".....	1,279,337	1,037,293	868,115
Other grain, lbs	977,967	747,930	868,083

BRAN AND SHIP STUFFS.

Flour, bbls....	293,117	172,578	242,755
Peas and beans...	106,088	75,808	160,234
Potatoes, lbs...	51,755	53,109	117,919
Dried fruit "...	320,364	164,533	78,007

ALL OTHER AGRICULTURAL PRODUCTS.

Cotton, lbs....	35,498	11,356	29,239
Tobacco, lbs...	150,735	43,127	237,007
Clover & grass seed, lbs....	231,518	116,692	148,746
Flaxseed, lbs...	103,219	35,268	30,536
Hops, lbs.....	188,179	159,695	262,893

MANUFACTURES.

Domest. spirits...	473,651	385,471	526,938
Leather, lbs....	963,201	690,842	885,030
Furniture, lbs...	197,254	153,536	111,630
Br and pg lead...	19,288	3,875	506
Blm & bar iron...	660,896	172,931	558,120
Pig iron, lbs....	340,496	744,687	96,362
Iron ware, lbs...	123,808	80,993	52,131
Domes woollens...	2,369,187	882,851	895,991
Domes cottons...	740,901	622,652	698,816
Salt, bushels...	133,836	106,522	73,666

OTHER ARTICLES.

Stone, lime and clay, lbs....	63,129	92,379	74,061
Gypsum, lbs....	17,584	8,336	5,742
Mineral coal...	81,453	108,559	56,633
Sundries, lbs...	2,944,911	2,001,252	2,241,539

STATEMENT showing the aggregate value of the property which came to the Hudson river, on all the canals, during the years 1847, 1848 and 1849, under the divisions as specified in the above table:—

The Forest....	8,798,373	5,909,015	8,044,646
Agriculture....	54,624,849	37,338,290	37,053,206
Manufactures...	6,024,518	3,634,360	3,699,237
Merchandise...	517,594	593,619	508,048
Other articles...	3,127,080	2,210,622	2,280,473

Total	\$73,092,414	\$50,883,907	\$51,745,219
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Vessels Built in the United States.

We take from the official report of the Register of the Treasury, a condensed statement of the vessels built during the year ending 30th June last, and the enrolled tonnage of the United States, with the number of foreign arrivals and departures during the same period:

Statement showing the Number and Class of Vessels built, and the Tonnage thereof, in each state and Territory of the United States for the year ending on the 30th June, 1849.

States.	Ships.	Brigs.	Scho's.	Steamers.	Sloops and canal boats.	Total number of vessels built.	Total ton.	95ths.
Maine.....	119	107	105	6	7	344	82,256	56
New Hampshire....	8	..	4	..	..	12	6,265	89
Vermont.....	..	..	..	..	..	..	..	..
Massachusetts....	33	7	65	9	1	115	23,888	84
Rhode Isl'd 3	3	4	3	..	..	13	2,760	28
Connectic't 2	1	38	14	1	..	56	5,066	29
New York. 17	8	64	155	21	..	265	44,104	26
New Jersey.....	..	1	57	27	2	87	8,025	55
Pennsylvania.....	3	2	27	102	63	197	24,207	73
Delaware. 1	..	17	5	..	..	23	1,880	34
Maryland. 9	9	129	..	5	..	152	17,462	93
Dist. of Columbia...	..	..	..	22	..	22	609	20
Virginia... 1	3	32	1	3	..	38	3,094	65
North Carolina...	1	1	24	3	..	29	2,032	37
South Carolina...	..	..	6	..	2	8	655	57
Georgia... 1	..	..	..	1	..	2	756	37
Florida... 1	..	..	..	..	..	1	119	88
Alabama... 2	1	..	..	..	..	3	106	54
Mississippi.....	..	..	..	..	..	..	..	..
Louisiana... 1	12	4	4	21	..	21	1,755	48
Tennessee... ..	..	..	..	2	..	2	242	79
Kentucky... ..	..	..	..	34	..	34	8,423	33
Missouri... ..	..	..	..	8	11	19	2,886	54
Illinois... .. 1	3	9	..	..	..	13	2,270	34
Ohio... .. 2	9	8	44	63	..	128	12,816	92
Michigan... ..	..	15	2	8	..	25	5,148	66
Texas... ..	..	..	..	..	..	..	..	..
Oregon... ..	..	..	..	..	..	..	..	..
Total....	198	148	633	370	208	1,547	256,577	47

Statement of the Registered and Enrolled Tonnage of the United States, showing the Tonnage employed in the Whale Fishery; also Tonnage of the Enrolled and Licensed Tonnage employed in the Coasting Trade, Cod Fishery, Mackerel Fishery, and Whale Fishery, from 1842 to 1849, inclusive:

Yr.	Registered Tonnage.	Enrolled and Licensed Tonnage.	Registered Tonnage in Wh. Fishy.
42.	986,368-74	1,117,031-90	2,092,300-69
43.	1,009,305-01	1,149,297-92	2,152,601-93
44.	1,068,764-91	1,211,330-71	2,250,095-07
45.	1,095,172-44	1,321,820-57	2,417,002-06
46.	1,131,256-40	1,431,795-32	2,562,084-51
47.	1,281,312-92	1,397,732-80	2,839,045-77
48.	1,360,846-84	1,793,165-00	3,154,041-85
49.	1,488,941-53	1,875,013-71	3,334,015-20

PROPORTION OF THE ENROLLED AND LICENSED TONNAGE EMPLOYED IN THE

Yrs.	Coasting	Trade	Cod Fishery	Mackerel Fishery	Whale Fishery
'42...	1,045,753	39	54,804	02	16,096
'43...	1,076,155	50	61,324	25	11,775
'44...	1,109,614	44	85,224	77	16,170
'45...	1,190,888	27	69,825	66	21,413
'46...	1,259,870	89	72,516	17	36,463
'47...	1,452,625	35	70,177	52	31,451
'48...	1,620,988	16	82,651	82	43,558
'49...	1,781,410	84	73,882	00	42,242

CONDENSED STATEMENT OF TONNAGE OF SOME OF THE PRINCIPAL PORTS OF THE UNITED STATES.

New York	378,962	89	417,504	85	796,491	79
Boston	247,336	14	49,553	85	296,890	04
New Bedford	115,091	12	8,826	45	123,911	57
Bath	61,938	38	26,822	40	88,820	84
Portland	56,657	01	29,911	79	84,588	80
Philadelphia	53,821	91	134,265	25	188,057	21
Baltimore	79,682	31	53,343	04	134,025	35
New Orleans	81,895	39	168,387	80	240,206	24
Charleston, S. C.	14,919	78	14,365	65	29,285	48
Wilmington, N. C.	10,873	94	5,767	88	16,641	87
Norfolk, Va.	5,025	52	13,090	00	23,016	26
Mobile	7,080	48	17,982	31	25,067	79
Buffalo			40,667	34		
Pittsburg			35,770	63		
Detroit			33,466	94		
St. Louis			32,255	08		
Cleveland			30,047	11		
Oswego			22,151	63		
Chicago			17,322	43		
Cincinnati			16,897	74		

Sum total, 1,438,941 54 1,895,073 71 3,334,015 29
Statement of the Number of Entrances of American and Foreign Vessels which entered into the several districts of the United States, from Foreign Countries, during the year ending June 30, 1849.

AMERICAN VESSELS.

No.	Tons.	Men.	Boys.
11,208	2,658,321	105,718	3,329
9,992	1,710,515	87,033	2,651
20,200	4,368,724	192,751	5,989

TOTAL OF AMERICAN AND FOREIGN VESSELS.
Statement of the Number of Clearances of American and Foreign Vessels from ports in the United States during the same.

AMERICAN VESSELS.

No.	Tons.	Men.	Boys.
11,466	2,753,724	109,349	3,423
8,849	1,675,709	89,579	7,704
20,313	4,429,433	198,928	6,125

BANGOR LUMBER MARKET, 1849.

Amount of lumber surveyed during the season 1849, 160,418,808 feet.

April	10,351,356
May	21,328,356
June	20,516,215
July	13,103,733
August	15,266,216
September	14,405,821
October	26,816,374
November	36,573,293
December	2,057,264

Recapitulation.

Pine	74,176,591
Spruce	23,619,349
Hemlock, etc.	2,562,757
	100,358,697
	60,060,111
	160,418,808

60,060,111 feet of the above includes lumber pil-

ed out last season, likewise that piled out during the present season, together with lumber hauled from the interior. The amount piled out this season including that from adjacent towns hauled to market on teams will not probably exceed eight millions, leaving a balance of 62 millions piled out last season, (1848).—Bangor Whig. S. H.

Ohio Banks.

There are in this State three kinds of banks—1st, The Chartered, or "Old Banks," which were incorporated previous to 1846, and whose charters have not expired. 2d, The "Independent Banks," based upon a deposit of State stocks with the State treasurer, as security for their circulation, and each bank is also independent of all others. 3d, The "Branches of the State Bank," as they are called, although properly there is no State Bank *per se*, the Branches combined—united—forming what is termed the "State Bank." The whole number of banks in the State is fifty-six, and the number in each class as follows:

Old chartered banks	5
Independent banks	11
Branches of State bank	40

The condition of all the banks on the first Monday of November last, has been reported by the Auditor of State, and from his statement we select the following aggregates.

THE ELEVEN INDEPENDENT BANKS.

Specie	\$330,811 70
Notes of other banks	231,859 19
Due from other banks	199,684 77
Eastern deposits	291,478 72
State bonds deposited with treasurer	1,176,006 90
Notes and bills discounted	1,931,635 42
Capital stock paid in	690,410 10
Circulation	1,106,701 00
Due to banks	158,384 17
Deposits	1,001,788 48

THE FORTY BRANCHES OF STATE BANK.

Specie	\$2,516,386 01
Notes of other banks	570,258 51
Due from other banks	461,375 58
Eastern deposits	793,664 09
Safety fund deposited with board of control	824,157 10
Notes and bills discounted	10,163,878 13
Capital stock paid in	4,427,591 60
Circulation	7,988,913 00
Due to banks	289,650 00
Deposits	2,386,990 00

THE FIVE OLD BANKS.

Specie	\$395,631 59
Notes of other banks	779,213 13
Due from other banks	181,846 71
Eastern deposits	387,913 52
Notes and bills discounted	3,498,626 31
Capital stock paid in	2,001,226 00
Circulation	1,348,961 00
Due to banks	845,474 00
Deposits	1,045,565 97

From the above it will be found that the immediate liabilities of the three classes of banks respectively, are to their immediate means as follows:

INDEPENDENT BANKS.

Immediate means	\$2,229,832
Immediate liabilities	2,266,873

BRANCHES OF STATE BANK.

Immediate means	5,165,840
Immediate liabilities	10,665,553

OLD BANKS.

Immediate means	1,744,603
Immediate liabilities	3,239,980

In the above statement of "immediate means," capital stock, and bills and notes discounted are not included—regarding as *immediate means*, specie, bank notes, bank credits, eastern deposits, and State bonds deposited with the treasurer and the board of control; and as *immediate liabilities*, circulation, deposits and debts to banks.

From this official statement of the Auditor, the

banks of no State in the Union are stronger or more impregnable.

CINCINNATI BANKS.

There are in this city six banks: Independent—the Commercial and City banks; Branches of State Bank—the Franklin and Mechanics' and Traders'. Old Banks—the Lafayette and Ohio Life & Trust. The following are some of the aggregates:

	Circulation.	Deposits.
Ohio Life and Trust	\$6,375	\$552,389
Lafayette	92,227	333,504
Franklin	253,390	286,821
Mechanics' and Traders'	156,373	119,331
Commercial	35,606	339,565
City	46,396	1,505

Total	590,367	1,633,115
	Specie.	Bank Notes.
Ohio Life and Trust	11,729	600,322
Lafayette	72,755	99,128
Franklin	82,473	59,627
Mechanics' and Traders'	52,167	73,679
Commercial	21,457	44,166
City	9,454	5,481

Total	250,035	882,403
	Capital stock.	Discount.
Ohio Life and Trust	611,226	1,187,304
Lafayette	700,000	1,099,500
Franklin	169,000	536,199
Mechanics' and Traders'	100,000	292,176
Commercial	50,000	345,416
City	49,800	32,976

Total	1,679,026	3,493,571
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In addition to the above, the Ohio Life and Trust has a capital of \$2,000,000, which is loaned out on real estate, and the Commercial bank has 54,000 of safety fund stock, and the City bank has 50,000 dollars.

The entire circulation of the Cincinnati banks is 542,071 dollars less than the specie and bank notes on hand.

Michigan.

Central Railroad Company.—Below will be found a statement of the operations of the Michigan Central Railroad Co., for the fiscal year ending with the past month.

Length of road in operation	218½ miles.
Amount expended for construction, from Dec. 1, 1848, to Dec. 1, 1849.	\$766,655 20
Indebtedness of the company as near as can be ascertained, for materials or work in progress of delivery or execution, on account of construction, and not included in construction	\$8,000 00

RECEIPTS.

Receipts fm passengers	\$321,114 50
Do freight	264,820 68
Other sources	15,051 42—\$600,986 60

EXPENDITURES.

For opening road, viz:	
Repairs of road	\$65,310 76
Do engines	39,832 27
Do cars	17,051 23
Other expenditures	173,285 52—\$296,079 78
Number of through passengers	46,053 1
Do way do	91,818

ROAD FURNITURE.

Number of engines	28
Do passenger cars	28
Do baggage do	4
Do freight do, viz:	
Eight-wheeled or double	250
Equal in single cars to	500
Four-wheeled cars	71—571
Number of other cars	91
Average number of men	483
Number of miles run by passenger trains	230,800
Do do do freight, do.	149,315
Do do do other, do.	98,531

The above comprehends all of the material facts relative to the business of the company.

As a matter of interest, we give the number of

passengers going east and west each month, and the receipts of the same;

Passengers East and West, and Receipts.

Westward. Receipts.			Eastward. Receipts.		
Dec. '48..	2988	\$5,177 75	2621½	\$4,329 56	
Jan. '49..	2130	3,555 95	2079½	3,618 70	
Feb. do..	1912	3,438 91	1931½	3,756 16	
March do..	3101½	5,144 82	3236	5,484 77	
April do..	4136	10,004 15	4045	9,837 41	
May do..	8738	21,661 96	5750	10,263 86	
June do..	8455½	16,726 03	6217½	14,512 56	
July do..	7391½	12,268 49	5920	12,039 01	
Aug. do..	6186	12,563 86	5156½	12,510 95	
Sept do..	11879	27,094 33	8601½	21,176 06	
Oct. do..	13042	36,994 88	8695	26,149 12	
Nov. do..	8197½	21,251 59	5469½	15,293 11	

78,187 175,895 73 59,714½ 145,001 27

Total number of passengers..... 137,901½
Total receipts for..... 321,114 50

COMPARATIVE STATEMENT.

We add comparative statements of some of the principal items for 1848 and 1849:

Total receipts from passengers, 1849..... \$321,114 50
Do. do. do., 1848..... 155,771 34

In favor of 1849..... \$165,343 26

Total receipts for freight 1849..... \$264,820 68

Miscellaneous receipts..... 15,051 42-\$279,872 10

Total receipts freight, '48 208,819 37

Miscellaneous receipts..... 9,391 10-\$218,210 47

In favor of 1848..... \$61,661 63

Number of through passengers.. 13,409 46,053½

Do way do .. 69,778½ 91,848

In favor of 1849..... 56,369½ 45,905½

Total receipts freight and pass., 1849.. \$600,986 60

Do do do 1848.. 373,981 81

In favor of 1849..... \$227,004 79

Road repairs..... \$65,910 76 38,721 06

Engine do .. 39,832 27 30,845 03

Car do .. 17,051 23 19,358 60

Other expenses..... 173,285 52 109,781 58

The last item includes locomotive service, station

do., fuel, oil, stationery, new buildings, repairs to

do., and incidental expenses of all kinds.

ROAD FURNITURE.

1849. 1848.

In 1849, 250 eight-wheeled or

double freight cars, and in

1848, 188 do., equal to single

cars..... 500 376

Four-wheeled or single cars.... 71 71

Gravel and other do 94 84

Passenger do 28 12

Baggage do 4 4

Engines..... 28 26

1849. 1848.

Miles run by passenger trains. 200,860 101,893

Do freight do... 149,315 113,069

Do other do... 98,541 116,811

Aver. number of men employed 483 308

Total construction account, 1848.. \$1,911,078 43

Do do do 1849.. 766,655 20

From the above figures, it will be seen that the

business of the road has been rapidly increasing,

notwithstanding the great check upon travel and

business of all kinds, by the prevalence of the

cholera during the past season.

The road continues under the able supervision

of J. W. Brooks, Esq., whose industry and perse-

verance eminently qualifies him for the responsible

and laborious task.

PUBLIC HYGIENE.

Continued from page 804.

He afterwards goes on to say, that it is not the

body alone which suffers by living amidst wretch-

edness and filth; the mind also becomes weakened.

The quiet unresisting way in which the laboring

class, habituated to dwell in such places, give way

to the wretchedness of their lot, when attacked by disease, is a melancholy proof that they have lost the intelligence and spirit proper to the race of man. Their dullness and apathy indicate an equal degree of mental and physical paralysis. Physical wretchedness here does its worst on the human sufferer, for it destroys his mind. Again he says, the effluvia generated in close dirty districts, even when not bringing on positive disease, acts as a sedative in depressing both body and mind. It induces physical listlessness, rendering the people incapable of any great exertion, and this feeling of depression is one of their chief inducements to the use of stimulating liquids and opium, often arises from a sensation of lassitude and languor, the direct result of the debilitating causes that are incessantly acting upon them, and that renders them so incapable of physical and mental exertions."

To show how general is the ill effect of bad air upon the organs of the body, we may adduce the evidence of another medical gentleman, who had directed his attention to the structure of the ear, and the cause of the deafness. In deaf persons, the membrane of the middle ear, as it is called, becomes thicker. It is a semi-transparent membrane of extreme sensitiveness and delicacy. After a dissection of several hundred ears, the anatomist in question came to the conclusion, that this membrane was injuriously affected by contact with foul air, and that the deafness might in many instances be ascribed to this cause.

From what has been stated, we cannot any longer be surprised at the fact of the mortality of persons resident in towns, being so much greater than those living in the country; narrow confined alleys, air-tight courts, small, densely-crowded houses, cellar dormitories,—these are places with which all towns abound, where fevers and other epidemics are always busy to a greater or less extent, and whence they spread, as from radiating centres, into healthier parts. It must be kept in mind, that the influence of these seats of pestilence is by no means confined to those who reside within their immediate limits. Disease extends itself to the whole town, poisoning the atmosphere which all classes breathe, and hence all are interested in effecting an abatement of the evils with which such places are afflicted. There is one part of Leeds so thickly inhabited that the people are packed together at the ratio of a 193,500 on the geographical mile; and there is a part of London where the population is at the ratio of 243,000 to a geographic square mile. But a part of Liverpool presents the maximum density of English cities. There the inhabitants are at the extraordinary rate of 657,936 to the same area, nearly 2½ denser than the densest part of London. Whilst the annual mortality in the country districts of England is about 1 in 55, and that throughout England and Wales (town and country) is one in 46, the deaths in the metropolis are 1 in 37½, and in Liverpool, 1 in 28½. In the country districts, out of every 1000 deaths, 202 are above 70; the average number of septuagenarians, in 1000, throughout England and Wales, is 141, whilst in the towns it is only 90, in the metropolis it is 111, and in Liverpool 54. Out of every 1000 children born in London, 408 die under 5 years of age; in Liverpool 528; that is to say, 53 out of every 100. The average age of death at Kendal is about 36, at Bath 31, in four metropolitan unions 25, in Leeds 21, in Liverpool 17.

These figures show in a striking light the superior chance of life of persons living in situations where they can breathe good air. An American physician (Dr. Emerson of Philadelphia) bears important testimony upon this point. It is common, says he, to attribute the greater mortality known to take place under ordinary circumstances in large towns among the poorer classes, chiefly to meagre or unwholesome food, and immoderate indulgence in strong liquors. But in this country, where, for a part of the year, we are subjected to a degree of heat, little if at all below that of the tropics, the influence of both these causes in the production of disease is insignificant, when compared to that of breathing air that has been previously respired, and which, moreover, is commonly charged with animal and vegetable effluvia. That the same diet and habits of life in the country or small towns would not be attended with a degree of sickness or mortality corresponding to that found in the

crowded portions of large towns, is, we think, beyond a doubt.

The complaints to which the inhabitants of towns are chiefly exposed, appear to be scrofula, fever and consumption; and it is quite worth our while to learn the way in which these disastrous complaints are generated, and the ravages they commit.

Scrofulous Affections abound to an enormous extent among the poorer classes—such is the testimony of medical men—and they are mainly attributable to the continued breathing of vitiated air.—Sore eyes, abscesses near the joints, ringworm and leprosy, are some of the various forms which scrofula assumes. Both on the continent and at home they are found to prevail in the most confined and worst ventilated districts. If a change has taken place in such a district by the pulling down and rebuilding on a better plan of the houses, it has been always found that a considerable improvement resulted in the sanitary condition of the people. Professor Alison of Edinburgh says, positively, that of the early great mortality in large towns, a very large proportion is caused by scrofulous disease; and the Queen's physician, Sir James Clark, says there can be no doubt that the habitual respiration of the air of ill-ventilated gloomy alleys in large towns, is a powerful means of augmenting the hereditary disposition to scrofula, and even of inducing the disease where there is no hereditary disposition.

Fever of every kind essentially depends on a vitiated state of the blood, arising from the introduction of some, usually animal, poison into the circulating current.

The exhalations arising from decomposing animal and vegetable matter, such as the contents of ashpits and cesspools, favor, in the highest degree, the extension of (if they do not of themselves generate, as many eminent medical men think) the disease of fever.

The mortality of all towns is very much increased by the vicious construction of the dwellings in respect to ventilation, and the supply of receptacles for refuse and excrementitious matter; the absence of drains, the deficient sewerage, and the overcrowding of the population, leading to gross neglect of personal cleanliness. These causes operate partly to induce the specific disease of fever, and partly to deteriorate the general health of the inhabitants, in such a way as to make them more liable to the attacks of nearly all diseases, but particularly of the specific disease alluded to, and also of those organs which first bear the brunt of the poison, i.e., the organs of respiration.

The period of existence during which fevers are prevalent is from 20 to 40, the period of maturity, and of this period the earliest part of it is much the most subject. It was found that the average number of patients in the London fever hospitals, 1825 to 1828, for four years, was 610 per annum; and of these, 390 were between the ages of 15 and 30, while the remaining 220 were made up of patients belonging to periods of life above and below this.

An experience of ten years preceding January, 1834, and derived from nearly 6,000 cases, gave data for calculating, that out of 100,000 patients attacked with fever,

Between the ages of 15 and 26 there would die	11,494
" " 25 " 36 "	17,071
" " 35 " 46 "	21,960
" " 45 " 56 "	30,493
" " 55 " 66 "	40,708
" " 65 " upwards "	44,643

The risk of life thus appears to be twice as great at the age of 31 as it is at 11; nearly twice as great at 41 as it is at 21; and nearly five times as great at 61 as it is at 11. The rate of mortality in fever progressively and rapidly increases as life advances, yet the number of persons who actually perish by this disease at the adult age, and in the meridian of life, is far greater than at any other period of existence, on account of the much greater number of persons who are attacked at those epochs.

It is a singular fact with regard to epidemics, that a certain type prevails for a number of years, and that this type sometimes gradually, at other times suddenly, disappears, and gives place to another, so different as to constitute a new disease, requiring new remedies, frequently the very opposite of those employed before. This new type in its turn gives place to a third, and so on for a long se-

ries of years. These changes, notwithstanding their apparent capriciousness, depend no doubt upon fixed and determinate causes, but those causes have not been ascertained.

Any deterioration in the physical condition of the body, not only renders it more liable to be attacked by this disease, but renders the disease more severe and fatal.

As to the insidious disease of consumption, the registrar-general puts down the appalling number of 60,000 as its victims every year in England and Wales. Of this number, Dr. Gray thinks that about 36,000 are cases of true pulmonary consumption, and he estimates the possible annual saving of adult life at 5000. In London, the deaths from consumption are 13½ per cent. of the total annual mortality, and 1 in 246 of the population. In Liverpool, it is nearly 18 per cent. of the deaths, and 1 in 156 of the population. The proportion of deaths of females from consumption is—for England and Wales, 1 in 431; for the metropolis 1 in 464; for Birmingham, 1 in 404; for Manchester, 1 in 392; and for Liverpool, 1 in 298. Dr. Gray attributes a large proportion of the deaths from consumption, among the laboring classes, to the deficient ventilation of the places where they work; and he gives many details, the result of personal examination, which show the poisonous condition of very many workshops in the metropolis. Next to defective ventilation in destroying human life is to be ranked the inhalation of dust, metallic particles, and irritating fumes. A fruitful source of disease is the abuse of spirituous liquors.

The most important part of our subject remains behind, and yet we have little space left for its discussion. What are the means of mitigating the evils arising from the inhalation of foul air? Prevention being better than cure, we must clearly do our utmost to remove the vitiating causes, and where that is impossible, we must obtain frequent supplies of air from a purer source. The first object will be attained by the employment of scavengers to remove from the surface the bulkier refuse, and by the construction of drains and sewers on scientific principles, the thorough and systematic working of both being carried on and enforced under efficient superintendence. The drainage of towns is at present very defective. In some places the drains are open to the air, and allow pestiferous exhalations to rise into the atmosphere. Covered drains are frequently made with an insufficient fall, or of a shape that permits the heavier part of the floating refuse to settle and accumulate. Hence the current becomes clogged, is soon stopped, and the drain then becomes utterly useless, until the obstructions are removed. The sewers from the private houses into the main drains are very often in a defective state, and it is highly important that those who have the superintendence of drains should have the power to enter houses under proper regulations, in order to examine the sewers. A whole neighborhood may otherwise be contaminated by the obstinacy of one man. Secondly, ventilation must be employed to supply the interior of apartments with air in a fit state for respiration. This is a subject as yet confessedly but little understood, and very much neglected. A fine field is here opened for mechanical ingenuity, and a large amount of good might be conferred on the public by practical men taking the subject into consideration. This much seems certain, that there ought to be an opening at or near the top of every room, in order to permit the escape of bad air. Being warmer and lighter than pure air, it ascends, and can only be dislodged by an expedient of this kind. Sir James Clark, in his work on the "Sanative Influence of Climate," speaks very highly of a contrivance invented by Dr. Arnott, for ventilating rooms by means of a valved opening in the chimney near the ceiling. The valve is so nicely adjusted and balanced that it admits a free current from the upper part of the room, the region of the most impure air into the chimney, and yet prevents all return of smoke. Much, says Sir James, as Dr. Arnott has done by his scientific inventions—the hydrostatic bed, the self-regulating stove, the ventilating air pump, etc.—the chimney ventilator, as a means of preserving health, may be regarded as the most important of the whole; and simple as it appears, it is unquestionably one of the most valuable gifts ever contributed by science to the preservation of

health. The contrivance consists of a square iron tube, three to six inches in diameter, and so long that the outer orifice should be flush with the wall of the room, the inner one entering the chimney. These tubes are usually from four to six inches long. At the orifice next the room there is either a plate of perforated zinc, or a piece of fine wire work, from the upper and back part of which hangs a piece of ordinary or oiled silk, which acts as a valve.

Mr. Toynbee, the senior surgeon to a large metropolitan dispensary, has introduced a method of ventilating apartments, which has answered very well. The ventilator consists of a plate of zinc very finely perforated with 220 holes to an inch, for the admission of external air through the windows. It varies from 4 to 12 inches square, according to the size and construction of the room. It is generally introduced into the uppermost portion of the window, and in the corner pane farthest from the fire place. The fine orifices prevent the air coming in with a rush, which would occasion discomfort, and they tend to diffuse the air equally and gently throughout the room.

The want of a direct and thorough perception of the fatal results of using vitiated air, has undoubtedly kept back many remedial improvements, which it is to be hoped are now dawning upon us. Our enemy is insidious—unseen in its deadly progress—hence it has unhappily escaped in a great measure the scrutiny of practitioners, who find scope enough in working out plans for counteracting the effects of more tangible evils.

As we began, so we shall conclude our article, by quoting the words of Dr. Arnott, whose scientific attainments, great exertions, and benevolent intentions give him a right of audience whenever the question of public hygiene is brought forward. "Suitable laws, and a fit administration of them, may go far to annihilate influences which now weaken constitutions, generate epidemics, and doom many of the laboring classes to hospitals, and workhouses, with the consequences to all around them of lowering the morality and the general tone of mind. Thus would a laboring population, among whom there is now much depression, suffering and disease, be changed into a more healthy, hardy and happy people, likely to prosper in their undertakings, and to exhibit civilization in improved forms."

Report of the Secretary of the Treasury.

We continue our extracts from the public documents for the purpose of laying before our readers such matters of interest as they may contain, and also for the purpose of preserving a record of them for future reference:

As every producer in one branch of useful industry is also a consumer of the products of others, and as his ability to consume depends upon the profits of his production, it follows that to give prosperity to one branch of industry there will be individual rivalry, but among the several branches of useful industry, there must always exist an unbroken harmony of interest.

No country can attain a due strength or prosperity that does not by its own labor carry its own productions as nearly as possible to the point necessary to fit them for ultimate consumption. To export its raw material and reimport the articles manufactured from it, or to neglect its own raw materials and import the articles manufactured from that of another country, is to pretermitt the means which nature had provided for its advancement.

For, instance, we exported during the fiscal year ending 30th June, 1849, raw cotton to the amount of about sixty-six millions of dollars. If that cotton had been spun and woven at home, (supposing its value to be increased fourfold by manufacture,) it would have produced a value of about one hundred and ninety-eight millions in addition. What would have been the effect of this increased production on the prosperity of the country?

This question would not be completely answered by merely pronouncing the added value of one hundred and ninety-eight millions of dollars, to be a large profit to the manufacturer, any more than the question of the effect of the production of wheat would be answered by deducting the cost of seed

wheat from the value of the crop, and pronouncing the remainder to be a large profit to the farmer.

The manufacture of cotton cloth is begun with the planting of cotton—it is carried a certain point by the planter, and then taken up and perfected by the spinner and weaver. The planter and manufacturer are not engaged in different branches of industry, but in the same—the one commences the process which the other completes. Cotton seed of insignificant value being by regular stages of labor developed and brought to the form of cotton cloth, has acquired a value of about two hundred and sixty-four millions.

The planting states have added many millions to the annual productions of the country by the culture of cotton. By continuing the process they could quadruple that addition.

The planter then would have a market at his door for all his produce, and the farmer would in like manner have a home market for his. The power of consumption of not only breadstuffs, but of every article useful or necessary in the feeding, clothing, and housing of man, would be vastly increased—the consumer and producer would be brought nearer to each other, and in fact a stimulus would be applied to every branch of protective industry.

It is gratifying to know that the manufacture of cotton has already been introduced into several of the planting states, (see document marked, hereto annexed,) and it ought not to be doubted will rapidly be extended.

The manufacture of iron, wool, and other staples would lead to similar results. The effect would be a vast augmentation of our wealth and power.

Upon commerce the effects might be expected to be, if possible, still more marked. It is not enough to say that no country ever diminished its commerce by increasing its productions, and that no injury would therefore result to that interest. There would probably be, not only a great increase in the amount, but an improvement not less important in the nature of our commerce.

Of the immense addition that would accrue to our internal and coasting trade, (which in every country form the great and most valuable body of commerce,) it is unnecessary to do more than merely speak in passing—but it may be well to offer a few remarks on foreign commerce.

Commerce is the machinery of exchange. It is the handmaid of agriculture and manufactures. It will not be affirmed that it is ever positively injurious—but it will be more or less useful as it co-operates more or less with the protective industry of the country. The mere carriage of commodities by sea or land is necessarily profitable only to the carrier, who is paid for it. It may be useful or not to others according to circumstances. The farmer finds a railroad a great convenience, but he understands that it is better employed in carrying his crop, than in carrying away his seed, wheat and manure.

The commerce which should consist in carrying cotton seed abroad, to be there grown, would not be so useful as that which is now occupied in exporting the raw cotton grown at home. We should easily understand, also, that the commerce thus employed would be much more limited in amount, and much less profitable to the carriers than what we now have. Yet our present commerce is, in fact, of the same nature with that above described. The seed bears to the cotton the same relation which the cotton bears to the cloth. If we now export cotton of the value of about sixty-six millions, the same cotton when converted into cloth, would make an export of some two hundred and sixty-four millions, or some two hundred and forty-five millions, after deducting the fifteen or twenty millions, which would be required for our own consumption, in addition to the portion of our present manufactures consumed at home, and our imports would be hereby in like manner increased. England, at this moment, derives a large portion of her power from spinning and weaving our cotton.—When we shall spin and weave it ourselves, make our own iron, manufacture our own staples, we shall have transferred to this country the great centres of wealth, commerce, civilization, and political, as well as moral and intellectual power.

At present, we are far from having the amount of foreign commerce which is due to our position,

as a vastly productive country, with an extensive coast, good harbors, great internal water-courses, and a people unsurpassed in maritime skill and enterprise.

Our annual products were estimated by my predecessor in this department, at three thousand million dollars, while our average exports are about one hundred and thirteen millions, and our imports about one hundred and six millions, making together two hundred and nineteen millions, exclusive of gold and silver and of foreign commodities imported and re-exported. An eminent British authority estimates the annual creation of wealth in Great Britain and Ireland, at between two thousand one hundred, and two thousand millions. If we add, for articles omitted by him, between three and four hundred millions, we shall have a total of two thousand five hundred millions. The British exports and imports amount annually to about five hundred and twenty millions, exclusive of gold and silver, and of foreign commodities imported and re-exported. If their foreign trade brought down to our scale upon this estimate, it would be reduced to about one hundred and eighty-three millions. If ours were raised to their scale, it would reach about six hundred and twenty-four millions.

Estimating the population of Great Britain and Ireland at thirty millions, and our population at twenty one millions, their foreign trade averages \$17.23 for each individual; ours \$10.42. If their foreign trade were no greater than ours, in proportion to population, it would be reduced from five hundred and twenty to three hundred and twelve millions. If our foreign trade were as great in proportion to population as is theirs, it would be swelled to amount from two hundred and nineteen to three hundred and sixty-four millions.

A leading cause of the existing difference is to be found in the fact, that Great Britain exports chiefly what she has first brought to the form in which it is ready for ultimate consumption; it is at the stage of its highest value, and her market is almost co-extensive with the civilized world.

All history shows that where are the workshops of the world, there must be the marts of the world, and the heart of wealthy commerce, and power.—It is as vain to hope to make these marts by providing warehouses, as it would be to make a crop by building a barn.

Whether we can have workshops to work up, at least, our own materials, must depend upon the question, whether we have or can obtain sufficient advantages to justify the pursuit of this kind of industry.

The circumstances favorable to production in this country may be stated to be: 1st. Facility in procuring raw materials. 2d. Abundance of fuel.—3d. Abundance of food and other articles necessary for the sustenance and housing of the laborer. 4th. The superior efficiency of the laborers in comparison with those of other countries.

The circumstances supposed to be unfavorable to our production may be thus classed—

1st. Want of capital.

2d. Dearness of our labor as compared with that of other countries.

3d. Insecurity by exposure to the influence of violent and excessive fluctuations of price in foreign markets, and to undergo foreign competition.

1st. Capital, which is but the accumulated savings of labor, is believed to be abundant among ourselves for any purpose to which it can be profitably applied. It is more divided than in some other countries, and associations of capital are therefore more common among us than elsewhere. It will be increased by the labor of every successive year, and for investments reasonably secure, it will flow in whenever required (as it has always heretofore done) from other countries, where it may exist in greater abundance. The amount of capital required for a large production is not enormous.—The whole capital, for instance, employed in the establishment and support of iron works in England and Wales in 1847, has been estimated at less than one hundred million dollars; the annual production then being about one million two hundred thousand tons.

2d. The difference between the price of labor here and in Great Britain is certainly great, and it is to be hoped and expected, will never be diminished by a reduction of wages here. The difference

has been estimated at an average of thirty-three per cent. Probably the average difference is much more than that. In some branches, such as the manufacture of iron, it is certainly much greater. This difference is in part compensated by the disadvantages under which the foreign manufacturer is placed, by the necessity, in some branches, of procuring his raw material from a great distance, or transporting a heavy article of production, such as iron, to a distant market. In addition, he is pressed by a heavy burden of taxation. The greater efficiency of our labor is, to some extent, an additional compensatory element. This includes the greater capacity for acquiring skill, the superior general intelligence, the higher inventive faculty, the greater moral and physical energy, both of action and endurance, which our people possess, in comparison with the foreign laborer. Better fed, clothed, housed, educated—conscious of the ability to lay up some capital annually from his savings—encouraged to invest that capital in the enterprise in which his labor is engaged—enjoying practically greater civil and political liberty—looking forward to an indefinite future, in which, through his own good conduct and example, he may expect each successive generation of his descendants to be better circumstanced than his predecessor—it cannot be doubted that these advantages add greatly to the efficiency of the American laborer. The precise extent to which they go towards compensating the difference in the price of labor is difficult to define. The efficiency of our labor may be expected to increase with increase of reward to the laborer. In many of the New England factories, the laborers are encouraged to invest their surplus earnings in the stock of the company in which they are employed, and they are thus stimulated, by direct personal interest, to the greatest exertion. It may be expected that this system will be introduced into other branches, in which it may be found practicable, tending, as it does, so powerfully, to elevate the laborer, increase production, and practically instruct all men in the great truth of the essential harmony of capital and labor.

3d. Capital flows freely, at home and abroad, in every productive channel in which it can flow safely, and will even incur great hazards, if they be such as its owner may hope to meet by the care and circumspection of himself, or others to whom he has confided its management. But if he knows that skill, industry and economy cannot avail him, and that, in addition to all the contingencies of rivalry and markets, he is to be further exposed to dangers arising from causes, quite beyond his control or counteraction, he will hold back. The vacillations which have occurred in our policy have no doubt deterred a large amount of capital from investment in industrial pursuits. The encouragement offered on one day, and on the faith of which fixed investments have been made, which are exposed to loss by the withdrawal of that encouragement on the next, is in fact substantial discouragement. And the insecurity resulting from the repetition of such acts has been seriously detrimental.

4th. The fluctuations in the foreign markets, have for many years been such as seem to denote an unhealthy and feverish state of business. They are not in the natural course of a healthy trade.—They seem to betoken a change in existing arrangements, and the apprehension of such change is also evinced in the efforts now making in England to sustain the British manufacturer, by putting at hazard other important branches of industry. The competition of new establishments with very large ones already in existence abroad, and in which the price of labor is lower, is evidently not an equal competition. The capital fixed in machinery, furnaces, &c. cannot be changed, and the work of production will not cease until the price shall have been reduced to a point very little above the cost of materials, labor and repairs. Of course, where the lower price is paid for labor, there will be a larger margin for reduction by the sacrifice of part of the profit; and where a great accumulation is in hand of the avails of the business of former years, the owner may find it his interest for a while to sell his commodity at less than the actual cost, if by that means he can drive out his rival, looking, of course, to subsequent reimbursement, at least, when he shall again have control of the market.

This known necessity of the position of the foreign manufacturers of course tends to discourage new, as well as to defeat the successful operation of existing investments of capital here, in similar enterprises.

To counteract the influence of these unfavorable circumstances, which, so long as they continue, must greatly retard our advancement, limit our foreign commerce, and prevent the due progress of industry, I propose that the duties on the staple commodities, [whether raw material or manufactured articles] in which foreign nations compete with our productions, be raised to a point at which they will afford substantial and sufficient encouragement to our domestic industry, provide for the necessary increase and due security of the revenue and ensure the permanence and stability of the system. Experience has, I think, shown this to be a wise, just and effectual mode to promote new and revive languishing branches of industry, provided the selection of the objects be wisely made, and limited to those productions for which the country is naturally adapted.

We have been perhaps too long hesitating and vacillating on the threshold of a great career.—The want of stability in the course of legislation, and other disturbing causes, have heretofore occasioned inconveniences. The short duration of some of the tariff acts—the great expansion of the currency which occurred during their operation—the compromise act, [a result of what was believed to be a political necessity] which, whatever its effects on existing establishments, undoubtedly discouraged new adventurers—and finally the unexpected repeal of the act of 1842—these circumstances have certainly been of a retarding character.

Yet it is impossible not to observe that, at every favorable moment, vast improvements in advance have been made, and that the ground thus gained has not been entirely lost. It is believed that every article, the manufacturer of which has been established here, has, after that establishment, continued gradually to diminish in price, and that, without a corresponding reduction in the wages of labor, which, indeed, could not be diminished by reason of an increased demand for it.

These facts lead irresistibly to the conclusion that our labor becomes so much more efficient by use, acquired skill, enlarged establishments, and new facilities derived from invention; that the difference in price between it and the foreign labor, however serious an obstacle to successful competition, will become less so with every year of our activity in the same branches of industry; and that it by no means follows that labor must be worse paid because its products are sold cheaper, or that because labor is better paid, its products must be sold dearer.

All that is wanting is a general determination that industry shall be encouraged and supported in the home production and manufacture of iron, wool, cotton, sugar and other staples, and that the legislation necessary to sustain it shall be firmly adopted and persevered in.

I will proceed to state the nature of the modifications which it appears expedient to make in the existing tariff, and, if required, will hereafter present a plan in detail.

1. The rates of duty are, in my opinion, too low, especially on articles similar to our own staples.—I conceive that the revenue has suffered materially from this circumstance. Indeed, I am compelled to believe that it would have been greatly diminished but for the extraordinary demand for our breadstuffs and provisions produced by the famine in Europe in 1847, and to a great extent continued by the short crop abroad in 1848. Even under these favorable circumstances, the average revenue from wools, cottons, hempen goods, iron, sugar, hemp manufactured, salt and coal, has fallen under the act of 1846, from \$14,162,607 to 13,392,624 50, taking the average from the receipts of 1845-6, and those of 1848-9, being an average diminution of \$769,982 50. The loss of annual revenue being as follows:

On cottons.....	\$918,894 00
On hempen goods.....	61,794 50
On sugar.....	181,741 50
On salt.....	348,438 00
On coal.....	70,030 00
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\$1,580,898 00	

The gain as follows:

On woollens.....	\$355,592 50
On iron.....	415,240 00
On hemp manufactured.....	40,083 00

\$810,915 50

The very small increase on the staples of woollens, iron, and unmanufactured hemp, compared with the vast injury occasioned to our production and the diminution thereby of our power of consumption, cannot fail to attract attention—while on the other articles named, the revenue and production have both suffered materially. It is believed that the revenue could be greatly increased by increasing the duties on these and other articles.

2. I propose a return to the system of specific duties on articles on which they can be conveniently laid. The effects of the present ad valorem system are twofold, viz: on the revenue and on our own productions. Experience has, I think, demonstrated, that looking exclusively to the revenue, a specific duty is more easily assessed, more favorable to commerce, more equal and less exposed to frauds, than any other system. Of course, such a duty is not laid without reference to the average cost of the commodity. This system obviates the difficulties and controversies which attend an appraisement of the foreign market value of each invoice, and it imposes an equal duty on equal quantities of the same commodity. Under the ad valorem system, goods of the same kind and quality, and between there cannot be a difference in value in the same market at any given time, nevertheless may often pay different amounts of duty. Thus the hazards of trade are unnecessarily increased.

AMERICAN RAILROAD JOURNAL.

Saturday, January 5, 1850.

The INDEX for the past volume will accompany our next number.

With our present number we commence a new volume, and a new year of our connection with the *American Railroad Journal*, and we can wish "a happy new year" to the great interests to which our paper is devoted, with a firm conviction that it will prove a far more prosperous one than the past. After a season of unexampled depression in all branches of business, in which no species of property has suffered so severely as railways, we have unmistakable evidence that we are on the return tide to a period of greater prosperity. The trials to which this kind of property has been subjected have been brought with it an experience which will teach us to avoid in future many of the errors which have been instrumental, to a certain extent, in producing the depression we have witnessed, and in bringing into discredit railway property. Confidence in railways, as the most effective means for the development of our vast resources, is undiminished, and with the new aid that increased experience is constantly furnishing us, we may expect a corresponding increase in the usefulness of these, the most potent agents that man has yet employed for his material and physical well being.

Notwithstanding the very general depression of the interests to which our paper is devoted, and our own inexperience in the new duties in which we have been engaged, we are happy in being able to state that our success has been far beyond our expectations. Our subscription list numbers more than twice as many names as it contained at the commencement of the past year. Our other patronage has increased in like proportion. We hope to be able to repay in some degree the favors which have been so freely extended to us, by a greater effort to promote the welfare of those great interests to which our paper is devoted, and upon which it rests for support.

[Foreign Correspondence of the Railroad Journal.]

ON BOARD THE EUROPA,
NOV. 17, 1849.

What a marvel is the steamship! The *Europa*, the last built and finest of the line of Royal Mail Steamers, is 275 feet long, 40 feet beam, and 1,800 tons burden. Her engines are 90 inch cylinder, 8 feet stroke, and 350 horse power each.

She consumes from 40 to 65 tons of coal per day, averaging 50 tons, and in consequence rises upon the water 24 inches, or 2 feet 9 inches in the voyage. She can make ten miles the hour with a strong headwind, and has made the passage from Liverpool to Boston in 9½ days, the shortest on record.

We left Boston on the 7th, and have had quite a smooth sea, but a head wind most of the time; yet we are now ploughing up St. George's Channel, along the coast of Ireland, and shall, but for some untoward accident, be in Liverpool to-morrow morning at 7 o'clock, in which case we can if we choose take the cars to London, thence to Fokestown, or packet thence to Boulogne, and the cars thence to Paris, arriving at the latter place at 9 A. M., on the 19th, 11½ days from Boston. Thus are continents separated by a distance of more than 3000 miles made neighbors by means of a steamship!

As far back as 1807, Fulton put his first successful steamboat into operation, amid the scoffs and fears of the scientific as well as the ignorant. In 1812, the first steamboat succeeded in England.

These steamers for rivers and smooth waters, increased but slowly for many years. It was not till 1818, that the first was placed upon the western waters. In 1823, 15 were built in the United States. In 1826, 45. In 1832, 100. In 1846, 225. Within the last 15 years, this class of shipping has increased with wonderful rapidity, both in Great Britain and the United States.

The whole number belonging to the former may with safety set down at 1,500, and 2,000 to the United States. So that coastwise and internal steam navigation is now a well established and very important branch of commerce. Ocean steam navigation is of much more recent date, and may as yet be considered in its infancy.

The idea of connecting the Old World with the New, by packets sailing regularly on stated days, was not put into operation until 1820. In that year Messrs. Isaac Wright & Jeremiah Thompson, of New York, aided by Messrs. Crowther, Benson & Co., of Liverpool, established a line of 4 packets of about 450 tons each, between New York and Liverpool. They sailed from both places on the 10th of each month. Prior to this, vessels had always waited for their freight and passengers, and the experiment of having them sail on stated days, whether freighted or not, was regarded as almost sure to fail. Men of judgment, of business capacity, and not frightened at a project because new, were at the head of the enterprise, and carried it through so successfully that in less than five years, they doubled the number of their packets, and changed the times of sailing to the 1st and 16th of each month. In a few years, the number was still further increased, and a vessel left each port weekly. A variety of other lines of packets had also been established between important cities. Meantime, steamers had come into great favor, and had superseded sailing craft as regular and speedy carriers upon rivers and coastwise. The query was thus very naturally suggested, why they should not supersede the ocean packets. The scientific were appealed to for an answer to the question, and they

demonstrated the absurdity of the proposition. The great majority of business men bowed in submission to the Savans, conspicuous among whom stood Dr. Lardner. Fortunate for the world there are men in every age who insist that experiment is the most satisfactory way to settle such answers.

In 1838, the *Syrius* was sent out to solve the question, soon followed by the *Great Western*.—Both arrived safely in New York, and some time after this Dr. Lardner reasserted his position that ocean steam navigation was impracticable, and pointed to the trips of the *Syrius* and *Great Western* in proof.

Ten years have elapsed. For eight months steamers leave Boston or New York weekly for Liverpool, and the latter place for the former as often. In December, Jan'y, Feb'y and March they leave once in two weeks. The trips are made by some of the ships between New York and Liverpool on an average of less than 15 days, and in the 5 years not a single accident has occurred causing the death of a passenger in the Cunard line. The popularity of ocean steam navigation is established beyond a question.

Steam and Manufacturing Fuel.

The sources of an abundant supply of the best and cheapest fuel for steam and manufacturing purposes, continue to attract the attention which the importance of this subject demands. From the numerous and almost daily increasing railroad and steamship companies, and individual proprietors, this is a subject which necessarily challenges earnest and thorough investigation. Their increasing consumption of fuel, and the still greater demand arising from the magnificent ocean steam marine, now accumulating in our waters, together with the great diminution in the means of primitive supply furnished by the forest, admonish all of the urgent occasion for solving the problem, touching the cheapest and most reliable substitute for wood as a generator of steam.

Recent indications point to the semi-bituminous coals, as the variety in which most interest is felt, and to which most attention is being directed. The completion of that great national undertaking—the Chesapeake and Ohio canal—which connects the capital of the Union with the Allegheny mountains, and offers to the mining interest of the rich and inexhaustible Cumberland coal field, an unlimited means of transportation to tide water, at Alexandria, has contributed much to give this direction to the views of practical men. In the desire to contribute our contingent of labor, in the investigation that is now being instituted, we have collected from the very able and elaborate report made to Congress by Prof. Walter R. Johnson, the annexed comparison of the three principal coals that are classed as semi-bituminous.

Total waste ashes and clinker from 100 lbs. of coal.	Weight per cubic foot.	Cubic feet per ton.	Earthy matter.	Pounds of coal evaporating 1 cubic foot of water.
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Templeman's Cumberland 7-96 2 54-29 41-26 10-36 6-5727
Dauphin and Susq. 16-363 50-54 44-32 21-49 7-499
Blossburg 11-2089 53-05 42-22 10-77 7-2069
Of the above varieties, the Cumberland coal alone has been tested to any satisfactory extent. Its constant use, for the two past years, on the Baltimore and Ohio railway—a work extending from Baltimore to Cumberland, a distance of 179 miles—attests its value. It is, we believe, the only in-

stance of a successful and protracted employment of coal, as a locomotive fuel, on a road of anything like the extent of the work referred to, which has yet been made in this country. This fact, we need hardly add, is entitled to great consideration—it being conclusive as to the adaptation of the Cumberland coal to locomotive use.

The able chief engineer of that road states that as the result of his experiments and tests, that one ton of this fuel is equal to two and one half cords of pine wood.

Much has of late been published on the subject of coals, and though we entertain no very alarming apprehension that the public will be *permanently* misled to ascribe virtues to any variety, to which it is not entitled, yet we cannot resist the temptation to transcribe, from the excellent work of Prof. Taylor, the subjoined paragraph.

"We continually meet with the unreserved and unqualified assertions of these claimants, that the coal of their particular mine or district, no matter where, is the best yet discovered for every practical use. Now, as they cannot all be the best, it follows that a good deal of exaggeration prevails in some of these cases. It is not inappropriate to state here, that there are probably a dozen or more of coal companies, in England, Wales and America, who announce through the press that their particular coal has been decided by the Agent of the Great Western Steamship Company or some other steamer company, to be the best generator of steam of all coals yet tried. One gentleman has also conclusively shown, that one ton of the bituminous coal of Cumberland, Va., is, in mechanical effect, equal to two tons of anthracite."

"However, the test of science restores all things to their true value. The examinations of Professor Johnson, in 1841, have dispelled many illusions—and have assigned to all the principal varieties of American coals their appropriate place in the catalogue: and here, the Cumberland coal takes the very highest place in the series, in the order of evaporative power."

Trade and Commerce of St. Louis.

Captain Embree has published in the St. Louis Daily Union, a statement of the quantities and value of eight staple articles in the Saint Louis market, the last two weeks of November, and the first two of December, for two seasons. In his recapitulation, the extent and comparison of the two periods are shown as follows:

1848.	
Tobacco, 307 hhds, 429,808 lbs.....	\$13,490 00
Hemp, 1,025 bales, 205 tons.....	22,011 80
Lead, 33,550 pigs, 2,349,480 lbs.....	88,382 79
Wheat, 124,384 sacks, 1,421 barrels, 253,031 bushels.....	191,531 54
Flour, 53,251 brls.....	221,484 60
Corn, 41,475 sacks, 82,950 bushels....	29,985 23
Oats, 8,746 sacks, 17,592 bushels.....	4,039 42
Whiskey, 2,535 brls., 101,400 gallons.	18,177 20
	\$589,103 38
1849.	
Tobacco, 318 hhds., 435,200 lbs.....	\$31,109 60
Hemp, 664 bales, 132 4-5ths tons.....	16,286 00
Lead, 62,818 pigs, 4,397,120 lbs.....	171,508 01
Wheat, 119,291 sacks, 1,068 barrels, 240,786 bushels.....	211,767 08
Flour, 51,829 brls.....	233,670 50
Corn, 7,909 sacks, 15,818 bushels.....	5,892 00
Oats, 10,053 sacks, 20,106 bushels.....	6,382 32
Whiskey, 2,596 brls., 103,840 gallons.	22,884 20
	699,499 11
Deduct.....	589,103 58
Difference in favor of 1849.....	\$110,395 53

South Carolina.

Charlotte and South Carolina Railroad.

The second annual meeting of this company was held at Winnsboro on the 10th of October, 1849.

It appears by the report of the President of the Company, Edward G. Palmer, Esq., that the whole work of preparing the road bed is now under contract. Iron has also been purchased for 90 miles of the road, and the whole work is being vigorously pushed forward to its completion.

The whole amount expended upon the road up to October 1, 1849, has been.

For graduation, masonry and trestle work.....	\$161,993 12
Superstructure.....	8,911 23
Catawba bridge.....	7,494 72
Engineering.....	23,855 27
Real estate.....	7,419 73
Land damages.....	4,122 88
Miscellaneous items.....	3,585 80
Total amount expended.....	217,382 75

The following table shows the estimated amount of expenditure for the year ending October 1, 1849.

Amount required to complete the graduation on first division.....	\$28,022 15
Amount required to complete the graduation on second division.....	59,035 04
Third div. including Catawba bridge.....	114,899 46
	201,956 65
To pay on contracts on fourth division.	40,000 00
" on timber contracts.....	\$36,237 98
Laying superstructure.....	15,000 00
1 Locomotive.....	6,825 00
Freight and expenses on do.....	250 00
8 Platform cars.....	3,600 00
Spikes.....	4,250 00
Freight and expenses on do.....	250 00
Chairs.....	4,080 00
	70,492 98

Expenditures required for which contracts have not been made:	
2 Locomotives.....	15,000 00
2 Passenger cars and 2 baggage cars.....	7,000 00
Depots, turnouts and water-stations.....	20,000 00
Chairs and spikes for second division.....	6,000 00
Timber & laying superstructure 2d division.....	15,080 00
Engineering.....	11,400 00
	74,480 00
	386,929 63
Of this amount, about.....	80,000 00
will be paid in work on graduation contracts.	
Leaving to be provided for.....	306,929 63

There remains yet of the capital stock of the company to be called in \$657,000, independent of the State subscription; and to meet the present indebtedness of the company, amounting to \$152,614 74, it is proposed to call for three instalments, one on the 1st of November, December and January; an instalment on the South Carolina stock amounts to \$33,000, and on the stock of North Carolina to \$9,000, amounting on the whole stock of the company to \$42,000, which three instalments to be called for together with the arrears of instalments now due \$42,000, constitute available means to the amount of \$168,000. To meet the expenses of the company that shall accrue during the remainder of the year, four other instalments will be called for, at intervals of sixty days. The State of South Carolina has subscribed to this road to the amount of \$260,000, payable in the bonds of the South Carolina railroad. This subscription to the amount of

\$200,000 has become available and has been of very great aid in furnishing means for the purchase of iron.

At Charlotte, this road will unite with the North Carolina Railroad, and in connection with it, will open a direct communication between the Central and Western portions of the latter State and Charleston. So that in addition to the business of the country it traverses, it will receive a large accession from the North Carolina road. A large amount of work on the road, has been done by the stockholders, in payment for stock, which has relieved the company from large cash payments, which would have seriously embarrassed its operations. Relative to this, we quote the following from the president's report:

"The practice of allowing stockholders to pay up their subscriptions in labor, is one of recent origin; is admirably calculated to increase the amount of stock subscribed, to facilitate its payment; and gives to the slave States great advantages over the free in the construction of railroads. As any one who has had the least experience on the subject cannot but be satisfied that slave labor is not only the most economical, but it is, also, the most efficient that can be applied to that purpose; and although this road was not, in the first instance, let in this manner, yet it has virtually resulted in it. The contractors, in many instances, hiring the hands of other stockholders, and purchasing their supplies of them, have contributed largely to the payment of stock in labor."

The affairs of the company appear to have been well managed, and the conduct of the directors received the unanimous approval of the stockholders.

The following is a list of the officers of the company:

Edward G. Palmer, President.

Directors—Dr. Charles J. Fox, A. Brevard Davidson, John A. Young, and William F. Phipper, of North Carolina; Joseph F. White, of York; Dr. John Douglass and James Pagan, of Chester; John Buchanan, of Fairfield; Benjamin F. Taylor, and James S. Boatwright, of Richland; Robert Martin, of Charleston.

John A. Bradley, Treasurer.

— Garnett, Chief Engineer.

ARCHITECTS AND ENGINEERS IN FRANCE.—Much good results in practice, from the fact of the architect being made responsible for the durability of his works. We rarely hear in France of the fall of important buildings, in consequence of their ignorance, or the employment of bad materials. Public opinion is also far more severe in that country than with us when such instances occur. Navier, perhaps the first mathematician who practised as an engineer, is reported to have destroyed himself, because his suspension bridge of Les Invalides fell into the Seine. The engineer of the Central who executed the bridge over the Loire, which sank during the execution, and afterwards fell down during the floods of 1847, was obliged to retire into private life; while English engineers allow bridges and viaducts to tumble down, and no notice is taken of it. Indeed, as long as the decision as to who are the parties to be blamed in these cases, is left to the juries, composed of the first twelve persons who come to hand, such must ever be the case. We require some competent authorities to decide in these instances; and then our common sense would not be insulted by the fact of the fall of a viaduct being attributed to the washing out of the mortar in the arch-joints, or to an unequal loading of the arches by the spreading of ballast in an irregular manner. In the first place, hydraulic mortar should have been used; in the second, a viaduct which could not resist an extra quantity of ballast, is not fit for locomotive traffic. It is true that the constant sense of responsibility is likely to restrain the adoption of new principles, but it is certainly likely to prevent architects or engineers from running unjustifiable risks.—*Builder.*

New Orleans and Jackson Railroad Convention.

A convention, numerously attended, was held at Monticello, Mississippi, on the 10th ult., for the purpose of promoting the construction of a railroad between the above named places, and was organized by the appointment of William A. Stone, of Lawrence county, Miss., President; E. Ford, of Marion; H. G. Street, of Amite; Capt. W. A. Grice, of Madisonville, La.; and A. G. Wilbur, of New Orleans; as Vice Presidents; and John Marshall, of Hinds, and Samuel A. Matthews, of Pike county, as Secretaries.

The following counties in Mississippi were represented, viz: Hinds, Copiah, Amite, Lawrence, Pike, Marion, as well as the Parishes of St. Tammany and Washington, La., and the city of New Orleans.

We learn that notwithstanding the extreme inclemency of the weather, the delegations from the above named counties in Mississippi were both numerous and highly respectable. Much spirit and enthusiasm prevailed during the sitting of the convention, and the resolutions, which were unanimously received, exhibit a degree of harmony very encouraging to the friends of this great enterprise.

We copy the following from the preamble and resolutions adopted by the convention:

Whereas, this convention, after a careful investigation of the subject, believe that the interests of the States of Mississippi and Louisiana, and the city of New Orleans, would be greatly promoted by a railroad from New Orleans to the city of Jackson, and that thereby the resources would be developed of a valuable portion of the country, now comparatively worthless for want of a convenient outlet to market—that it would promote the convenience of the people living in the counties and parishes along the line of the road—increase the value of their estates, and add millions annually to the value of the country; and this convention believing further that it is highly practicable to construct a railroad, and that the public spirit and pecuniary ability of the country through which it will pass, as well as the terminus of the road, may be safely relied on to furnish the means both of money and labor for the construction of said road: therefore,

Resolved, 1. That the convention pledge itself to a strong, united and vigorous exertion on behalf of said road: to sink all minor differences of opinion, and all individual preferences in relation to the route of said road, when the same shall have been located, and yielding to "the greatest good of the greatest number," unite heart and hand in its completion.

2. That a committee of one from each county, parish and city, represented in this convention, be appointed and empowered to employ the services of competent engineers to examine the routes from Jackson to New Orleans, over which a railroad could be made to the best advantage, terminating either at Madisonville, or by way of the Rigoleta at New Orleans, or to the same terminus by the route originally projected for the New Orleans and Nashville road, and who shall report fully the probable cost of each route, and the description of the country over which it would pass, which reconnaissance shall be under the superintendence of at least three members of said committee, who shall report the same with all the facts and statements made by such engineer to an adjourned meeting of this convention, to be held at such time and place as may be hereafter designated.

3. That the committee charged with procuring the charters be instructed to ask the Legislatures of Mississippi and Louisiana to memorialize Congress for a grant of the public lands in the counties and parishes through which the road may run, to be appropriated towards its construction.

4. That when this convention adjourns, it shall be to meet again in the city of New Orleans, on Thursday, the 21st day of March next.

The chair, in pursuance with the above resolutions, appointed the following committees:

On Routes—John Marshall, of Hinds; E. Ford, of Marion; Wm. H. Bowen, of Lawrence; Arch-

bald Steele, of Copiah; Franklin Love, of Amite; S. M. Catchings, of Pike; Capt. W. A. Grice, of Madisonville; J. M. Bell, of New Orleans; and N. S. Edwards of Washington Parish, La.

On Statistics—Wm. F. Robinson, of Amite; J. T. Lamkin, of Pike; Col. C. S. Tarpley of Hinds; Dr. George Nicholson, of Pike; Col. E. Safford of Marion; and J. B. DeBow, of New Orleans.

On Memorials—Samuel J. Peters, James Robb, J. W. Stanton, Alfred Hennen, John Leeds, James Saul, New Orleans; M. G. Penn, St. Tammany Parish, La.; Col. C. S. Tarpley W. Stone, Dr. J. T. Catchings, S. A. Matthews, P. S. Catchings, John J. Guion, John Wall, Mississippi.

On motion, the thanks of the committee were tendered the President and Secretaries, for the faithful manner in which they had discharged their duties.

The convention then adjourned to meet in New Orleans on Thursday, the 21st March, 1850.

An Account of the Construction of the Britannia and Conway Tubular Bridges.

The appearance of this work has been looked for with much interest, not only from the novelty and magnitude of the operation, which it records, but also from the question which has been raised as to the degree of merit due to the several eminent scientific and practical men whose combined talent has produced so characteristic a monument of this iron age. With respect to the latter part of the question, whilst it will only be proper to reserve our judgment until the appearance of Mr. Clarke's work on the same subject, we are free to confess that Mr. Fairbairn's close and continued argument, which we could not satisfactorily abridge, seems to us satisfactorily to establish the justice of his claims. We proceed for the present to give such extracts as may best enable our readers to form a correct idea of the design and execution of the work:

"In the construction of the Chester and Holyhead Railway, two formidable obstacles had to be overcome. The deep and rapid tidal streams at the Conway and Menai Straits, had to be crossed by bridges, which must necessarily be of extraordinary span and of great strength. No centerings or other substructures, such as are usually resorted to for putting such massive structures together, could be erected. Under such circumstances, the most obvious resource of the engineer was a suspension bridge, but the failure of more than one attempt had proved the impossibility of running railway trains over bridges of that class with safety. Some new expedient of engineering was, therefore, required, and an engineer bold and skillful enough to conceive such an expedient and to apply it. That engineer was found in Mr. R. Stephenson, and that expedient is the one, the history of which it is the object of the following pages to relate. Under Mr. Stephenson's direction, numerous other schemes had been devised. Both timber and cast-iron arches had been thought of; and a model of a very handsome bridge for crossing the Menai Straits on the latter principle, had been constructed, and it was, I believe, submitted to the consideration of a parliamentary committee. The possibility of erecting cast-iron arches over so great a span as 450 feet was, however, questionable, and the security of such a bridge could not but have been endangered by the great changes to which the material would have been subjected from atmospheric influences, and from the vibrations produced by the passage of heavy trains; but a more important objection even than these weighed in the withdrawal of this design. The Lords Commissioners of the Admiralty, as conservators of the navigation, opposed the erection of any structure which should offer a hindrance to the free passage of vessels under it, and insisted upon a clear headway of 105 feet from the level of high water. It was under these circumstances—having to encounter extraordinary difficulties of execution, and being compelled, by the opposition of so powerful a branch of the Government as the Admiralty Board, to abandon the ordinary resources of the engineer—that Mr. Stephenson conceived the original idea of a huge tubular bridge,

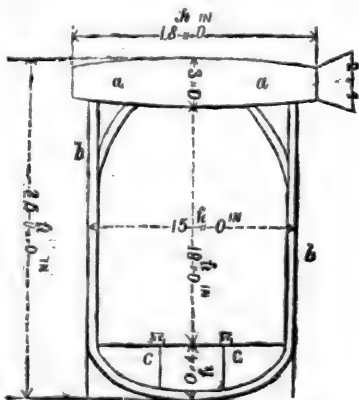
to be constructed of riveted plates, and supported by chains, and of such dimensions as to allow of the passage of locomotive engines and railway trains through the interior of it. It was with reference to this expedient, after all others had been found inapplicable, that I was consulted by him, and that my opinion was requested—first, as to the practicability of the scheme; and, secondly, as to the means necessary for carrying it out. This consultation took place early in April, 1845; and, as far as could be gathered from Mr. Stephenson at the time, his idea then was, that the tube should be either of a circular or an egg-shaped sectional form; he was strongly impressed with the primary importance of the use of chains, placing his reliance in them as the principal support of the bridge, and he never for a moment entertained the idea of making the tube self-supporting. The wrought iron tube, according to his idea, was indeed entirely subservient to the chains, and intended to operate on its rigidity and weight as a stiffener, and to prevent, or at least to some extent counteract, the undulations due to the catenary principle of construction. In fact, for many months afterwards, and even up to the time of the experiments on the model tube in December, 1846, he insisted, as will be seen from the annexed correspondence, on the application of such chains. A perusal of this correspondence will, moreover, show that I was strongly opposed to their application, even as an auxiliary. I always felt that in a combination of two bodies, the one of a perfectly rigid, and the other of a flexible nature, there is a principle of weakness; for the vibrations to which the one would be subjected, would call into operation forces whose constant action upon the rivets and fastenings of the other could not but tend to loosen them, and thus, by a slow but sure agency, to break up the bridge. At the period of the consultation in April, 1845, there were no drawings illustrative of the original of the bridge, nor had any calculations been made as to the strength, form, or proportions of the tube. I was asked whether such a design was practicable, and whether I could accomplish it; and it was ultimately arranged that the subject should be investigated experimentally, to determine not only the value of Mr. Stephenson's original conception, but that of any other tubular form of bridge which might present itself in the prosecution of my researches. The matter was placed unservedly in my hands; the entire conduct of the investigation was entrusted to me; and, as an experimenter, I was to be left free to exercise my own discretion in the investigation of whatever forms or conditions of the structure might appear to me best calculated to secure a safe passage across the Straits. This freedom of action was obviously necessary to the success of my experiments. I cannot but feel myself to have been honored by that confidence in my judgment which it implied. A period of five weeks was occupied in the construction of the experimental models, and in devising the means and preparing the necessary apparatus for the experiments. The whole series, detailed in the appendix, was conducted at my works, Millwall, Poplar; and the earlier experiments were witnessed by Mr. H. Ross and Mr. R. Murray, as assistants. Subsequently, when the large model tube was made, and the ultimate sectional form almost arrived at, Mr. E. Clarke, one of Mr. Stephenson's assistants, was also present, and for his employer's information, took copious notes of the proceedings. In consequence of the favorable opinion entertained by Mr. Stephenson of the cylindrical tubes, it was deemed expedient to commence experiments upon models of that kind, and to extend them subsequently to elliptical tubes. The whole of the results and observations made during the progress of the researches, as well as a description of the apparatus employed, I have carefully arranged and placed as an appendix, thinking that in that shape they would be more easy of reference to the scientific reader, who would thus be able to trace the gradual development of the principle of construction ultimately arrived at, from the experiments which led to it. On entering upon the correspondence, I may remark, that I have in general printed the letters entire; and, where selections have been made, the parts omitted usually referred to matters of a private nature. No doubt many communications are altogether missing, but I have

endeavored to connect the whole by such remarks as will render the narrative consecutive and clear. The following letter to Mr. Stephenson, was written during the experiments on the cylindrical tubes, and it details some early reflections with reference to a form of tube intended, in a manner, to meet Mr. Stephenson's views, but which suggested itself to my mind as superior to one supported by chains. He had conceived the idea, in which I then, to a certain extent, concurred, that the upper side of the tube should be brought into a state of tension as the lower, so that its strength, although a rigid structure, should not lie, as that of a beam does, in its resistance to tension on the one side, and to compression on the other, but wholly in a resistance to tension, as that of a flexible structure does. With this view, it was thought that something like the form of a catenary should be given to it, with a rigid bottom and sides.

"MILLWALL WORKS, May 31, 1845.

"My Dear Sir: It has occurred to me that the plate-bridge might be made considerably stronger by adopting a different form of construction, and by judicious arrangement, the whole might be made in one span of such an extent as 450 feet, so as to render it self-constructive in the formation of its own scaffold or platform. I have considered the subject with the utmost care since I left you, and, after repeated comparison, I am induced respectfully to submit the following rough sketch and description for consideration.

"On contrasting the forces of extension and compression with each other, I find we must place our sole reliance upon the resisting forces of a tensile strain, and to use that of compression only for the purpose of giving tenacity and rigidity to the structure. With these views, I would suggest that the whole of the upper sides of the iron tube or tunnel should sustain the load, and for that purpose I would incline to the annexed section (see fig. 1.) The parts *a a*, to be each 18 feet wide, 3 feet deep in the middle, and 2 feet 4 inches at each end, and composed of plates say half an inch thick, with angle iron frames, and connecting plates at every 10 feet. The sides, *b b*, to be composed of 5-16 (or quarter-inch patent) plates, with internal T iron frames, radiating from the upper curvature of the suspending plates. The bottom to be formed as before, with a permanent platform and rails, as represented in the sections at *c c*. The sides, *b b*, in this case, descending a little below the curves, for the purpose of rendering the whole somewhat



symmetrical. Now, if we examine into the properties of this construction, it will be found that the material so distributed will sustain in the upper section (at only 20 tons to the square inch) a tensile strain of 4,600 tons; and, provided we deduct one-third for riveted cross-joints, we still have upwards of 3000 tons for the strength of suspension, independent of the sides and bottom, which, if made of thick-edged plates, would give the power of resistance above 4,000 tons. In this hasty sketch, I have not gone into the question of weights; but, at a rough calculation, I should suppose one tube, of say 500 feet, would weigh about 500 tons, equal to a total of say 3000 tons, in two lines of 1500 feet each. These views will not interfere with the experiments now in progress, but I should be glad of your opinion, in order to guide me in the future de-

velopment of principles which, at present, are but imperfectly understood. I am, &c.

"R. STEPHENSON, C. E. W. FAIRBAIRN."

From the very commencement of the inquiry, the means which should be employed in erecting and raising such a large structure over a broad and rapid stream, was a subject of deep reflection; and the point seemed, indeed, surrounded with impediments not easily overcome. It was probably not essential to discuss such a question before the practicability of the scheme was ascertained, and the form and dimensions of the tube itself determined on; but it nevertheless weighed upon the mind, and as will be seen by the letters, numerous expedients were originated and discussed before the means actually adopted were matured. My first thoughts were expressed in these terms to Mr. Stephenson:

"MANCHESTER, June 3, 1845.

"My Dear Sir: My mind has been fully engrossed with the subject of the Menai Bridge. Whatever may be the principle upon which it is to be constructed, there will be no difficulty in its erection, nor will there be any considerable expense incurred. If, for example, the piers were erected, and the whole of the tubes riveted together in sections, we could first commence the erection by fixing the centre parts upon the saddles of the piers; this being accomplished, we should then proceed in each direction, fixing the sectional parts, and maintaining the weights and balance equally on both sides, till they meet in the middle.

"On this plan, the parts would always be in equilibrium on the middle of each of the piers, and by means of two moveable cranes and a working scaffold, as will be easily seen, we could work progressive forward with 10 ft. sections till they meet, when the two could be united in the usual way with rivets. By these means, I think every difficulty with regard to erection would vanish; and, provided the parts were well put together in the first instance, we might carry such a structure across any straits or ravine of even greater extent than the Menai Straits. I shall be glad to hear your opinion in addition to my former letter upon this and other matters, and remain, &c.

"W. FAIRBAIRN.

"R. STEPHENSON, Esq., C. E."

"The above letter proposes a self-constructing system of erection, to avoid, if possible, the dangers and difficulties attending the moving and raising of such an enormous weight to a height of 100 ft., or 120 ft., and then fixing it with safety upon the piers. On mature consideration, it appeared next to impossible to maintain the balance of so great a mass upon the pier as a fulcrum, and so to keep both ends in an exact line (as regards their horizontal and lateral position) as to cause them to meet in the middle. The plan was, therefore, abandoned for another of a more tangible kind. Previous to the date of the following letter, July 19, considerable progress had been made with the experiments on the cylindrical tubes, all of which were found more or less defective. Great difficulty was experienced in keeping them in shape; and the experiments, whilst they gave ground for confidence as to the ultimate result, showed pretty clearly that it was not to be attained under this form of tube. These facts are intimated to Mr. Stephenson as follows:

"MANCHESTER, July 19, 1845.

"My Dear Sir: The last course of experiments was not only satisfactory, but such as to induce a considerable alteration in form, as well as a much more extensive investigation. These researches require the utmost care; and new developments, as well as correct results, are only obtained by repeated trials of an experimental and inductive character. It shall be my special province to ascertain the facts, and determine the law which governs the strength and form of this important structure.

"Previous to leaving town, I gave orders for an increased number of tubular models, to be made of different forms and dimensions. Towards the end of the ensuing week, they will be completed, and I purpose again commencing the experiments on Wednesday morning, the 30th instant, when I hope you will be enabled, along with your father, to attend. I am, &c.

"R. STEPHENSON, Esq. W. FAIRBAIRN."

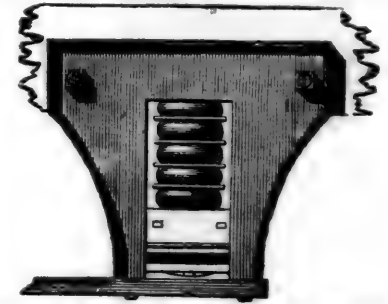
JULY 21, 1845.

My Dear Sir: * * I am glad to hear that you are proceeding with other forms of tubes; I hope some of them of an elliptical form, and with thick plates at the top and bottom, will be tried, for in this way the disposal of the material will approach nearly to that of a common T girder, which is doubtless the thing to be aimed at.

"Yours, &c., R. STEPHENSON.
"W. Fairbairn, Esq., Millwall, or Manchester."

To be continued.

FULLER'S PATENT INDIA RUBBER SPRING.



THESE SPRINGS ARE THE CHEAPEST, the lightest and most durable of any yet known. They are easily applied to new or old cars, and there is small possibility of any accident occurring to them.

Other parties through Mr. Ray set up claims to an India Rubber Spring which, though the same in principle, is very inferior in its working and durability. Actions are in progress for an Infringement on Fuller's Patent against parties using that Spring.

The superiority of Fuller's Spring over that claimed by Mr. Ray is fully established and has frequently been testified to. The following are from gentlemen who have had much experience with both Springs.

"It will afford me pleasure to recommend your springs to the companies in this region, in preference to Ray's which I am confident are inferior in mechanical arrangement to yours." JOHN M'RAE, Engineer S. Carolina R. R., Charleston..

"I do not hesitate to allow you to say that I concur in Mr. M'RAE's opinion that Ray's springs are inferior in mechanical arrangement to Fuller's. I repeatedly expressed that opinion long before Mr. M'RAE had seen your springs (as I believe) and entertain it still." WM. PARKER, Gen'l Supt. of Baltimore and Ohio R. R.

Office of Sup't Norwich & Worcester R.R. Co. }
December 26, 1849. }

"I most fully concur in the opinion of Jno. M'RAE, Engineer of S. Carolina Railroad, that 'Rays Springs are inferior to Fuller's Springs;' and shall with pleasure recommend them to all Railroad Companies for adoption. I have used both springs on this road and have no hesitation in saying that I should in all cases prefer Fuller's Spring."

SAM'L H. P. LEE, JR.,
Supt. and Engineer.

Office B. & P. R. R. Co., }
Boston, 20th December, 1849. }

"This company have cars fitted up with both Ray's and Fuller's 'Metallic India Rubber Springs,' and I do not hesitate to say that Fuller's arrangement is very much superior to Ray's." W. RAYMOND LEE, Supt.

The following result has been obtained by experiment upon one railroad.

A set of Trucks fitted with Steel Springs cost \$190-77 and weigh 2355 lbs. The same with Fuller's Springs, 131-71 " 1911 lbs.

Difference, \$59-06 " 444 lbs. Not only is there an advantage in the cost, but owing to the great reduction in weight, the car can be made lighter throughout, and so an enormous saving in weight may be effected in a Train.

G. M. KNEVITT, 38 Broadway, N. Y.,
General Agent for the U. S.
The Springs can also be had of
JAMES LEE & CO., 18 India Wharf, Boston, &
JAS. THORNLEY, 110 Chestnut St., Philad.

Iron.

Pig Iron, Anthracite and Charcoal; Boiler and Flue Iron, Spring and Blistered Steel, Nail Rods, Best Refined Bar Iron, Railroad Iron, Car Axles, Nails, Stove Castings, Cast Iron Pipes of all sizes, Railway Chairs of approved patterns for sale by

COLEMAN, KELTON & CAMELL,
109 N. Water St., Philadelphia.

Cop Waste.

CLEAN COP WASTE, suitable for cleaning Railroad, Steam boat and Stationary Engines, constantly on hand and for sale by

KENNEDY & GELSTON,
54 Pine St., New York.

October 27, 1849,

3m

To Railroad Companies and Contractors.

FOR SALE.—Two Locomotive Engines and Tenders, at present in use on the Beaver Meadow Railroad, being too light for their coal trains, but well calculated for either gravel or light passenger trains.

They weigh, in running order, about 8 tons each—having one pair of driving wheels 4 feet diameter, 4 truck wheels 30 inches diameter, with cylinders 10 in. diameter, and 18 inches stroke of piston. Tenders on 4 wheels. Address

JAMES ROWLAND,
Pres't. Beaver Meadow Railroad & Coal Co.,
Philadelphia.

or, L. CHAMBERLAIN, Sec'y,
at Beaver Meadow, Pa.

May 19, 1849.

20tf

The New York Iron Bridge Co.

LATELY KNOWN AS

Rider's Patent Iron Bridge Co.

THE Company which has hitherto furnished these Bridges, under the patent granted to the late Nathaniel Rider, deceased, have become satisfied that all the principles embraced in their construction, are included in a previous patent, granted in the year 1839, to Col. Stephen H. Long, of U. S. Engineers, and by him designated as "Long's Suspension Bridges," and have therefore made an arrangement with Col. Long, by which they have secured the exclusive right to make and vend these Bridges throughout the whole United States.

The only change consequent upon the new arrangement will be found in the name and style of the Company. The parties composing it being the same, the construction of the Bridges will be essentially the same. August 4th, 1849.

M. M. White, Agent,
au7tf No. 74 Broadway, New York.

Wanted,

A Second Hand Locomotive, weighing from 10 to 12 tons. It is required that in answer, it will be stated, whether the engine has inside or outside connections—the price of the same delivered at Portland, Maine, and terms of payment expected. Address

VIRGIL D. PANIS,
President Buckfield Branch Railroad,
Portland, Maine.

November 10, 1849.

3t45

To Contractors.

BLUE RIDGE TUNNEL.—The Contractor for the BLUE RIDGE TUNNEL, having failed to come forward and comply with his engagements, notice is hereby given that PROPOSALS will again be received at the Office of the Board of Public Works, until the 21st of January, 1850, for the construction of the Tunnel and approaches.

The Tunnel will be 4260 feet long, 21 feet high and 16 feet wide, with a ditch on each side; it will pass 700 feet under the top of the Mountain and decline from West to East at the rate of 70 feet to the mile. The approaches will be in the aggregate about 2000 feet long, and consist of deep cuts, high embankments, some walling and bridging.

Proposers who have not already examined the localities will do well to call at the office of the Engineer, on the spot, where they will obtain all necessary information.

The payments will be cash, with a reservation of 20 per cent till the entire completion of the work; besides which, the contractor is required by law to give bond, with satisfactory bond and security in Virginia. The amount of the bond required will be thirty thousand dollars.

The best testimonials and an energetic prosecution of the work are expected: the contract and bond to be executed within ten days after the letting, and the work to begin *bona fide* within sixty days after the same period.

C. CROZET.

Engineer Blue Ridge Railroad.

Terms of proposals and specifications may be obtained at both offices.

NOTICE TO**Superintendents of Railroads.**

TYLER'S PATENT SAFETY SWITCH.—The undersigned would respectfully call their attention to his Patent Safety Switch, which from long trial and late severe tests has proved itself perfectly reliable for the purpose for which it was intended. It is designed to prevent the train from running off when the switch is set to the wrong track by design or accident. The single rail or gate switch is established as the best and safest switch for the ordinary purpose of shifting cars from one track to another, but it is liable to the serious evil of having one track open or broken when connected with the other. My improvement entirely removes this evil, and while it accomplishes this important office, leaves the switch in its original simplicity and perfection of a plain unbroken rail, connecting one track with the other ready for use.

The following decision of the Commissioner of Patents is respectfully submitted to Railroad Engineers, Superintendents, and all others interested in the subject.

P. B. TYLER.

(COPY.)

UNITED STATES PATENT OFFICE,
Washington City, D.C., April 28th, 1846.

SIR: You are hereby informed that in the case of the interference between your claims and those of Gustavus A. Nicolls, for improvements in safety switches—upon which a hearing was appointed to take place on the 3d Monday in March, 1846, the question of priority of invention has been decided in your favor. Inclosed is a copy of the decision. The testimony in the case is now open to the inspection of those concerned.

Yours respectfully,
EDMUND BURKE,
Commissioner of Patents.

To Philos B. Tyler.

Any further information may be obtained by addressing P. B. TYLER, Springfield, Mass., or JOHN PENDLETON, Agent, 149 Hudson St., New York.

34tf

ENGINEERS.

Arrowsmith, A. T.,
Buckfield Branch Railroad, Buckfield, Me.

Banks, C. W.,
Civil Engineer, Vicksburg, Miss.

Berrien, John M.,
Michigan Central Railroad, Marshall, Mich.

Buckland, George,
Troy and Greenbush Railroad.

Clement, Wm. H.,
Little Miami Railroad, Cincinnati, Ohio.

Cozzens, W. H.,
Engineer and Surveyor, St. Louis, Mo.

Davidson, M. O.,
Eckhart Mines, Alleghany Co., Maryland.

Fisk, Charles B.,
Cumberland and Ohio Canal, Washington, D. C.

Felton, S. M.,
Fitchburgh Railroad, Boston, Mass.

Floyd-Jones, Charles,
South Oyster Bay, L. I.

Gzowski, Mr.,
St. Lawrence & Atlantic Railroad, Montreal, Canada.

Gilbert, Wm. B.,
Rutland and Burlington Railroad, Rutland, Vt.

Grant, James H.,
Nashville and Chattanooga R. R., Nashville, Tenn.

Harry, P.,
Binghamton, New York.

Holcomb, F. P.,
Southwestern Railroad, Macon, Ga.

Higgins, B.,
Mansfield and Sandusky Railroad, Sandusky City, O.

Johnson, Edwin F.,
New York and Boston Railroad, Middletown Ct.

Latrobe, B. H.,
Baltimore and Ohio Railroad, Baltimore, Md.

Miller, J. F.,
Worcester and Nashua Railroad, Worcester, Mass.

Morris, Elwood,

Schuylkill Navigation, Schuylkill Haven, Pa.

Morton, A. C.,

Atlantic and St. Lawrence Railroad, Portland, Me.

McRae, John,

South Carolina Railroad, Charleston, S. C.

Nott, Samuel,

Lawrence and Manchester Railroad, Boston,

Reynolds, L. O.,

Central Railroad, Savannah, Ga.

Roebbling, John A.,

Trenton, N. J.

Roberts, Solomon W.,

Ohio and Pennsylvania Railroad, Pittsburgh, Pa.

Robinson, James P.,

Androscoggin & Kennebec Railroad, Waterville, Me.

Schlatter, Charles L.,

Northern Railroad (Ogdensburg), Malone, N. Y.

Stark, George.,

Bost., Con. and Mont. R. R., Meredith Bridge, N. H.

Steele, J. Dutton,

Pottstown, Pa.

Trimble, Isaac K.,

Philad., Wil. & Baltimore Railroad, Wilmington, Del.

Tinkham, A. W.,

United States Fort, Bucksport, Me.

Thomson, J. Edgar.,

Pennsylvania (Central) Railroad, Philadelphia.

Whipple, S.,

Civil Engineer and Bridge Builder, Utica, N. Y.

Williams, E. P.,

Auburn and Schenectady Railroad, Auburn, N. Y.

Williams, Charles H.,

Milwaukee, Wisconsin.

BUSINESS CARDS.**George O. Robertson,**

Broker in Scotch and American Pig Iron; Bar Iron, Lead, Spelter, Tin, Copper, etc.,
NO. 4 LIBERTY PLACE, MAIDEN LANE,
(Near Broadway.)
NEW YORK

DUNLAP'S HOTEL,

On the European Plan,
NO. 135 FULTON STREET,
Between Broadway and Nassau St.,
NEW YORK.

Manufacture of Patent Wire ROPE AND CABLES,

For Inclined Planes, Suspension Bridges, Standing Rigging, Mines, Cranes, Derrick, Tillers, &c., by
JOHN A. ROEBLING, Civil Engineer,
TRENTON, N. J.

Samuel D. Willmott,

MERCHANT, AND MANUFACTURER OF
CAST STEEL WARRANTED SAWS,
IMPORTER OF THE
GENUINE WICKESLY GRINDSTONES,
NO. 8 LIBERTY STREET,
NEW YORK.

Doremus & Harris,

ANALYTICAL & CONSULTING CHEMISTS,
179 BROADWAY, NEW YORK.
SCHOOL OF CHEMISTRY.

Dudley B. Fuller & Co.,

IRON COMMISSION MERCHANTS,
No. 139 GREENWICH STREET,
NEW YORK.

**Railroad Car Manufacturer's
Furnishing Store.****F. S. & S. A. MARTINE,**

IMPORTERS AND MANUFACTURERS OF

**RAILROAD CAR &
CARRIAGE LININGS,**PLUSHES, CURTAIN MATERIALS, ETC.,
112 WILLIAM ST., NEAR JOHN.3-4 and 6-4 Damasks, Union and Worsted; Mo-
reens, Rattinets, Cloths, Silk and Cotton Velvets,
English Buntings**Walter R. Johnson,**CIVIL AND MINING ENGINEER AND AT-
torney for Patents. Office and Laboratory, F St.,
opposite the Patent office, Washington, D. C.**S. W. Hill,**Mining Engineer and Surveyor, Eagle River,
Lake Superior.**Starks & Pruyn,**MANUFACTURERS OF ALL KINDS OF
STEAM BOILERS,

52 and 54 Liberty, corner of Pruyn street

Nathan Starks, **ALBANY** Special Partner
Wm. F. Pruyn, R. H. Pruyn.
Iron Railing, Bank and Vault Doors, Iron Shutters
Bridge and Roof Bolts, Heavy Jobbing and Forging
of all kinds.

For particulars see Adv. in another column.

To Engineers and Surveyors.E. BROWN AND SON Mathematical inst. mak-
ers No. 27 Fulton Slip, New York, make and keep
for sale, Theodolites, Levelling inst., Levelling rods,
Surveyors Compasses, and Chains, Cases of Mathe-
matical drawing insts. various qualities, together with
a general assortment of Ivory Scales and small insts.
generally used by Engineers.**Samuel Kimber & Co.,****COMMISSION MERCHANTS**
WILLOW ST. WHARVES, PHILADELPHIA.AGENTS for the sale of Charcoal and Anthracite
Pig Iron, Hammered Railroad Car and Locomo-
tive Axles, Force Pumps of the most approved con-
struction for Railroad Water Stations and Hydraulic
Rams, etc., etc.
July, 27, 1849.**James Herron, Civil Engineer,**OF THE UNITED STATES NAVY YARD,
PENSACOLA, FLORIDA.,

PATENTEE OF THE

HERRON RAILWAY TRACK.Models of this Track, on the most improved plans,
may be seen at the Engineer's office of the New York
and Erie Railroad.**To Railroad Companies.****—WROUGHT IRON WHEELS—
SAFETY AND ECONOMY.****NORRIS' LOCOMOTIVE WORKS,
SCHENECTADY, NEW YORK,**Are Manufacturing Wrought Iron Driving, Truck,
Tender, and Car Wheels—made from the best Ameri-
can iron. Address E. S. NORRIS.

May 16, 1849.

Machinery Warehouse.S. C. HILLS, No. 43 Fulton street, New York, has
constantly for sale Steam Engines, Boilers, Lathes,
Chucks, Drills, Planers, Force and Suction Pumps;
Tenoning, Morticing and Boring Machines, Shingle
Machines, Bolt and Nut Machines, Belting, Oil, Iron
and Lead Pipe; Rubber, Percha and Leather Hose,
&c., &c.S. C. H.'s arrangements with several machine shops
are such that he can supply, at very short notice, large
quantities of machinery.

November 23, 1849.

Cruse & Burke,Civil Engineers, Architects and Surveyors,
Office, New York State Institution of Civil Engineers,
STATE HALL, ALBANY., N. Y.Drawings, specifications and surveys accurately ex-
ecuted. Pupils instructed theoretically and practical-
ly at a moderate premium.

May 26, 1849.

Eaton, Gilbert & Co.,
Railroad Car, Coach and Omnibus Builders,
TROY, N. Y.**Hudson River Foundry,
THOMAS & COLLINS,**

130 Quay Street, Albany.

To Railroad & Navigation Cos.Mr. M. BUTT HEWSON, Civil Engineer, offers his
services to Companies about to carry out the surveys
or works of a line of Navigation or Railroad. He can
give satisfactory references in New York City as to his
professional qualifications; and will therefore merely
refer here to the fact of his having been engaged for
upwards of two years conducting important Public
Works for the British Government.Communications will find Mr. Hewson at the office
of the Railroad Journal, 54 Wall Street, New York.**Alfred W. Craven,**

Chief Engineer Croton Aqueduct, New York.

Manning & Lee,GENERAL COMMISSION MERCHANTS,
NO. 51 EXCHANGE PLACE,
BALTIMORE.Agents for Avalon Railroad Iron and Nail Works,
Maryland Mining Company's Cumberland Coal 'CED
'—Potomac' and other good brands of Pig Iron.**IRON.****IRONDALE PIG METAL, MANUFACTURED**
and for sale by the Bloomsburg Railroad Iron Co.
DUDLEY FISHER, Treasurer.
75 N. Water St., Philadelphia.**Railroad Iron.**500 Tons, afloat, weighing 57 pounds per lineal
yard, for sale by

COLLINS, VOSE & CO.,

158 South St.

New York, November 17, 1849.

Railroad Iron.THE Undersigned, Agents for Manufacturers, are
prepared to contract to deliver Rails of superior
quality, and of any size or pattern, to any ports of dis-
charge in the United States.

COLLINS, VOSE & CO.,

158 South St.

New York, November 17, 1849.

Railroad Iron.

1600 Tons, weighing 60½ lbs. per yard.

185 " " 57½ "

580 " " 53 "

of the latest and most approved patterns. For sale by

BOORMAN, JOHNSTON & CO.,

119 Greenwich street.

New York, Oct. 13, 1849.

Railroad Iron.THE Undersigned have on hand, ready for immedi-
ate delivery, various patterns of Iron Rails, of
best English make, and manufactured in conformity
with special specifications.They offer also to import and contract to deliver
ahead—on favorable terms.

DAVIS, BROOKS, & CO.,

68 Broad street.

New York, Oct. 11, 1849.

Drawings and Patterns of the most approved
Rail—and specifications of quality and make of same,
are on hand at their office, for examination of parties
who may desire to inspect the same. D., B. & Co.
Oct. 11, 1849.**CUT NAILS OF BEST QUALITY, BAR IRON**
(including Flat Rails) manufactured and for sale
by

FISHER, MORGAN & CO.,

75 N. Water St., Philadelphia.

Railroad Iron.THE Undersigned offer for sale 3000 Tons Railroad
Iron at a fixed price, to be made of any required
ordinary section, and of approved stamp.They are generally prepared to contract for the de-
livery of Railroad Iron, Pig, Bar and Sheet Iron—or
to take orders for the same—all of favorite brands, and
on the usual terms.

ILLIUS & MAKIN.

41 Broad street.

March 29 1849.

3m.13

Glendon Refined Iron.Round Iron, Band Iron, Hoop Iron,
Square " Flat " Scroll "

Axles, Locomotive Tyres.

Manufactured at the Glendon Mills, East Boston, for
sale by **GEORGE GARDNER & CO.,**

5 Liberty Square, Boston, Mass.

Sept. 15, 1849.

3m37

**PATENT HAMMERED RAILROAD, SHIP &
BOAT SPIKES.**—The Albany Iron Works
have always on hand, of their own manufacture, a
large assortment of Railroad, Ship and Boat Spikes
from 2 to 12 inches in length, and of any form of head.
From the excellence of the material always used in
their manufacture, and their very general use for rail-
roads and other purposes in this country, the manu-
facturers have no hesitation in warranting them fully
equal to the best spikes in market, both as to quality
and appearance. All orders addressed to the subscrib-
ers at the works will be promptly executed.**JOHN F. WINSLOW, Agent.**

Albany Iron and Nail Works, Troy, N. Y.

The above Spikes may be had at reduced prices, of
Erastus Corning & Co. Albany; Meritt & Co., New
York; E. Pratt & Br. Inc. Baltimore Md**LAP—WELDED****WROUGHT IRON TUBES**

FOR

TUBULAR BOILERS,

FROM 1 1-2 TO 8 INCHES DIAMETER.

These are the ONLY Tubes of the same quality
and manufacture as those so extensively used in
England, Scotland, France and Germany, for Lo-
comotive, Marine and other Steam Engine Boilers**THOMAS PROSSER,**

Patentee.

28 Platt street, New York

Railroad Iron.THE UNDERSIGNED ARE PREPARED TO
contract for the delivery of English Railroad Iron
of favorite brands, during the Spring. They also re-
ceive orders for the importation of Pig, Bar, Sheet, etc.
Iron.**THOMAS B. SANDS & CO.,**22 South William street,
New York.

February 3, 1849.

Iron Store.THE Subscribers, having the selling agency of the
following named Rolling Mills, viz: Norristown,
Rough and Ready, Kensington, Triadelphia, Potta-
grove and Thorndale, can supply Railroad Companies,
Merchants and others, at the wholesale mill prices for
bars of all sizes, sheets cut to order as large as 58 in.
diameter; Railroad Iron, domestic and foreign; Loco-
motive tire welded to given size; Chairs and Spikes;
Iron for shafting, locomotive and general machinery
purposes; Cast, Shear, Blister and Spring Steel; Boil-
er rivets; Copper; Pig iron, etc., etc.**MORRIS, JONES & CO.,**

Iron Merchants.

Schuylkill 7th and Market Sts., Philadelphia.
August 16, 1849. ly33**Railroad Iron.**THE MOUNT SAVAGE IRON WORKS, AL-
legany county, Maryland, having recently pass-
ed into the hands of new proprietors, are now prepar-
ed, with increased facilities, to execute orders for any
of the various patterns of Railroad Iron. Commu-
nications addressed to either of the subscribers will have
prompt attention. J. F. WINSLOW, President

Troy, N. Y.

ERASTUS CORNING, Albany.

WARREN DELANO, Jr., N. Y.

JOHN M. FORBES, Boston.

ENOCH PRATT, Baltimore, Md.

November 6, 1848.

Railroad Iron.THE SUBSCRIBERS ARE PREPARED TO
take orders for Railroad Iron to be made at their
Phoenix Iron Works, situated on the Schuylkill River,
near this city, and at their Safe Harbor Iron Works,
situated in Lancaster County, on the Susquehanna
river; which two establishments are now turning out
upwards of 1800 tons of finished rails per month.Companies desirous of contracting will be promptly
supplied with rails of any required pattern, and of the
very best quality.**REEVES, BUCK & CO.,**

45 North Water St., Philadelphia.

March 15, 1849.

Monument Foundry.

A. & W. DENMEAD & SON,
Corner of North and Monument Sts.,—Baltimore,
HAVING THEIR

IRON FOUNDRY AND MACHINE SHOP

In complete operation, are prepared to execute faithfully and promptly, orders for Locomotive or Stationary Steam Engines, Woolen, Cotton, Flour, Rice, Sugar Grist, or Saw Mills,

Slide, Hand or Chuck Lathes, Machinery for cutting all kinds of Gearing, Hydraulic, Tobacco and other Presses, Car and Locomotive patent Ring Wheels, warranted,

Bridge and Mill Castings of every description, Gas and Water Pipes of all sizes, warranted, Railroad Wheels with best fagotted axle, furnished and fitted up for use, complete

Being provided with Heavy Lathes for Boring and Turning Screws, Cylinders, etc., we can furnish them of any pitch, length or pattern.

Old Machinery Renewed or Repaired—and Estimates for Work in any part of the United States furnished at short notice.

June 8, 1849.

Iron Wire.

REFINED IRON WIRE OF ALL KINDS, Card, Reed, Cotton-flyer, Annealed, Broom, Buckle, and Spring Wire. Also all kinds of Round, Flat or Oval Wire, best adapted to various machine purposes, annealed and tempered, straightened and cut any length, manufactured and sold by

ICHABOD WASHBURN.

Worcester, Mass., May 25, 1849.

American and Foreign Iron.**FOR SALE,**

300 Tons A 1, Iron Dale Foundry Iron.

100 " 1, " " " "

100 " 2, " " " "

100 " " Forge " "

400 " Wilkesbarre " "

100 " "Roaring Run" Foundry Iron.

300 " Fort " " "

50 " Catocin " " "

250 " Chikiswalungo " " "

50 " "Columbia" "chilling" iron, a very superior article for car wheels.

75 " "Columbia" refined boiler blooms.

30 " 1 x 1/2 Slit iron.

50 " Best Penna. boiler iron.

50 " "Puddled" " "

50 " Bagnall & Sons refined bar iron.

50 " Common bar iron.

Locomotive and other boiler iron furnished to order.

GOODHUE & CO.,

New York.

64 South street

American Pig, Bloom and Boiler Iron.

HENRY THOMPSON & SON,
No 57 South Gay St., Baltimore, Md.,

Offer for sale, Hot Blast Charcoal Pig Iron made at the Catocin (Maryland), and Taylor (Virginia), Furnaces; Cold Blast Charcoal Pig Iron from the Cloverdale and Catawba, Va., Furnaces, suitable for Wheels or Machinery requiring extra strength; also Boiler and Flue Iron from the mills of Edge & Hilles in Delaware, and best quality Boiler Blooms made from Cold Blast Pig Iron at the Shenandoah Works, Va. The productions of the above establishments can always be had at the lowest market prices for approved paper.

American Pig Iron of other brands, and Rolled and Hammered Bar Iron furnished at lowest prices. Agents for Watson's Perth Amboy Fire Bricks, and Rich & Cos. New York Salamander Iron Chests. Baltimore, June 14, 1849. 6 mos

LAP-WELDED WROUGHT IRON TUBES for Tubular Boilers, from 1 1/2 to 15 inches diameter, and any length not exceeding 17 feet—manufactured by the Caledonian Tube Company, Glasgow, and for sale by

IRVING VAN WART,

12 Platt street, New York.

JOB CUTLER, Patentee.

These Tubes are extensively used by the British Government, and by the principal Engineers and Steam Marine and Railway Companies in the Kingdom.

Railroad Iron.

THE TRENTON IRON COMPANY ARE NOW turning out one thousand tons of rails per month, at their works at Trenton, N. J. They are prepared to enter into contract to furnish rails of any pattern, and of the very best quality, made exclusively from the famous Andover iron. The position of the works on the Delaware river, the Delaware and Raritan canal, and the Camden and Amboy railroad, enables them to ship rails at all seasons of the year. Apply to

COOPER & HEWITT, Agents.

October 30, 1848. 17 Burling Slip, New York.

Pig and Bloom Iron.

THE SUBSCRIBERS ARE AGENTS for the sale of numerous brands of Charcoal and Anthracite Pig Iron, suitable for Machinery, Railroad Wheels, Chains, Hollowware, etc. Also several brands of the best Pudding Iron, Juniata Blooms suitable for Wire, Boiler Plate, Axe Iron, Shovels, etc. The attention of those engaged in the manufacture of Iron is solicited by

A. WRIGHT & NEPHEW,
Vine Street Wharf, Philadelphia.

Iron.

THE SUBSCRIBERS having resumed the agency of the New-Jersey Iron Company, are prepared to execute orders for the different kinds and sizes of Iron usually made at the works of the company, and offer for sale on advantageous terms.—

150 tons No. 1 Boonton Foundry Pig Iron.

100 " No. 2 do. do. do.

300 " Nos. 2 & 3 Forge do. do.

100 " No. 2 Glendon do. do.

140 " Nos. 2 & 3 Lehigh Crane do do.

100 " No. 1 Pompton Charcoal do.

100 " New-Jersey Blooms

50 " New-Jersey Fagotted Iron, for shafts

Best Bars, 1/2 to 4 inch by 1/2 to 1 inch thick.

Do do Rounds and Squares, 1/2 to 3 inch.

Rounds and Squares, 3-16 to 1 inch.

Half Rounds, 1/2 to 1 in. Ovals & Half Ovals 1/2 to 1 1/2 in.

Bands, 1/2 to 4 inch. Hoops, 1/2 to 2 inch.

Trunk Hoops, 1/2 to 1 1/2 in. Horse Shoes & Nut Iron.

Nail Plates. Railroad Spikes.

DUDLEY B. FULLER & Co., 139 Greenwich-st. and 85 Broad-st.

WILLIAM JESSOP & SONS'**CELEBRATED CAST-STEEL.**

The subscribers have on hand, and are constantly receiving from their manufactory,

PARK WORKS, SHEFFIELD,

Double Refined Cast Steel—square, flat and octagon.

Best warranted Cast Steel—square, flat and octagon.

Best double and single Shear Steel—warranted.

Machinery Steel—round.

Best and 2d gy. Sheet Steel—for saws and other purposes.

German Steel—flat and square, "W. I. & S." "Eagle"

and "Goat" stamps.

Genuine "Sykes," L. Blister Steel.

Best English Blister Steel, etc., etc., etc.

All of which are offered for sale on the most favorable terms by

WM. JESSOP & SONS,

91 John street, New York.

Also by their Agents—

Curtis & Hand, 47 Commerce street, Philadelphia.

Alex'r Fullerton & Co., 119 Milk street, Boston.

Stickney & Beatty, South Charles street, Baltimore.

May 6, 1848.

SPRING STEEL FOR LOCOMOTIVES, TENDERS AND CARS.

The subscriber is engaged in manufacturing spring steel from 1 1/2 to 6 inches in width, and of any thickness required: large quantities are yearly furnished for railroad purposes, and wherever used its quality has been approved of. The establishment being large, can execute orders with great promptitude, at reasonable prices, and the quality warranted. Address

J. F. WINSLOW, Agent,

Albany Iron and Nail Works.

JOHNSON, CAMMELL & Co's**Celebrated Cast Steel,**

AND ENGINEERING AND MACHINE FILES, which for quality and adaptation to mechanical uses, have been proved superior to any in the United States. Every description of square, octagon, flat and round cast steel, sheet, shovel and railway spring steel, best double and single shear steel, German steel, flat and square, goat stamps, etc. Saw and file steel, and steel to order for any purposes, manufactured at their Cyclops Steel Works Sheffield.

JOHNSON, CAMMELL & CO.,

100 William St., New York.

November 23 1849.

American Cast Steel.

THE ADIRONDAC STEEL MANUFACTURING CO. is now producing, from American iron, at their works at Jersey City, N.J., Cast Steel of extraordinary quality, and is prepared to supply orders for the same at prices below that of the imported article of like quality. Consumers will find it to their interest to give this a trial. Orders for all sizes of hammered cast steel, directed as above, will meet with prompt attention.

May 28, 1849.

To Steam Engine Builders.

THE Undersigned offer for sale, at less than half its cost, the following new machinery, calculated for an engine of 62 inches cylinder and 10 feet stroke, viz:

2 Wrought Iron Cranks, 60 inches from centre to centre.

1 Do. do. Connecting Rod Strap.

2 Do. do. Crank Pins.

1 Eccentric Strap.

1 Diagonal Link with Brasses.

1 Cast Iron Lever Beam (forked).

The above machinery was made at the West Point Foundry for the U. S. Steamer Missouri, without regard to expense, is all finished complete for putting together, and has never been used. Drawings of the cranks can be seen on application to

HENRY THOMPSON & SON,

No. 57 South Gay St., Baltimore, Md.

Sept. 12, 1849.

Railroad Instruments.

THEODOLITES, TRANSIT COMPASSES, and Levels, with Fraunhoffer's Munich Glasses, Surveyor's Compasses, Chains, Drawing Instruments, Barometers, etc., all of the best quality and workmanship, for sale at unusually low prices, by

E. & G. W. BLUNT,

No. 179 Water St., cor. Burling Slip.

New York, May 19, 1849.

Mattewan Machine Works.

THE Mattewan Company have added to their Machine Works an extensive LOCOMOTIVE ENGINE department, and are prepared to execute orders for Locomotive Engines of every size and pattern—also Tenders, Wheels, Axles, and other railroad machinery, to which they ask the attention of those who wish such articles, before they purchase elsewhere.

STATIONARY ENGINES, BOILERS, ETC., Of any required size or pattern, arranged for driving Cotton, Woolen, or other Mills, can be had on favorable terms, and at short notice.

COTTON AND WOOLLEN MACHINERY, Of every description, embodying all the modern improvements, second in quality to none in this or any other country, made to order.

MILL GEARING,

Of every description, may be had at short notice, as this company has probably the most extensive assortment of patterns in this line, in any section of the country, and are constantly adding to them.

TOOLS.

Turning Lathes, Slabbing, Planing, Cutting and Drilling Machines, of the most approved patterns, together with all other tools required in machine shops, may be had at the Mattewan Company's Shops, Fish-kill Landing, or at 39 Pine street, New York.

WM. B. LEONARD, Agent.

NOTICE.

TO BRIDGE BUILDERS, BRIDGE COMPANIES, and Other Individuals and Associations, who have constructed or used Bridges involving the combined principle of Bracing, Counter-bracing and Trussing by means of counteracting braces, keys, wedges, screws, etc., as set forth and explained in my Bridge Patent of 1830, in the words following, to wit: "A system of Counter-bracing, by means of which the truss frames are rendered stiff and unyielding, and the bridge kept in uniform action whether loaded or unloaded"—NOTICE is hereby given, that in all cases in which said combined principle has been introduced into bridges, without due license or authority from me, and without my having been duly remunerated therefor, will be regarded as infringements upon my rights and privileges, and that an amicable adjustment and settlement of all my claims in the premises may be effected by prompt application to my duly authorized Agents therefor, viz: Messrs. Clinton, Knight and Brother, of Cincinnati, Ohio, or Daniel A. Webster, Esq., 8 Pell street of the city of New York.

STEPHEN H. LONG, Patentee.

Louisville, December 10, 1849.

To Railroad Companies.

FOR SALE—A Second-hand Locomotive Engine and Tender, of about 10 tons weight, in good order, and warranted to perform well. Any company wanting a cheap engine for a passenger or light burden train, will rarely meet with an opportunity so favorable as the present. The engine and tender are in perfect running order, and will be tested to the satisfaction of any one wishing to purchase. Price \$1,500.

Address **J. B. MOORHEAD,**
Frazer P.O., Chester county, Pa.

P.S.—The Engine can be seen by calling on H. Osmond & Co., Car-builders, Broad st., Philadelphia.
September 6, 1849.

India-rubber for Railroad Cos.

RUBBER SPRINGS—Bearing and Buffer—Fuller's Patent—Hose from 1 to 12 inches diameter. Suction Hose. Steam Packing—from 1-16 to 2 in. thick. Rubber and Gutta Percha Bands. These articles are all warranted to give satisfaction, made under Tyer & Helm's patent, issued January, 1849.—No lead used in the composition. Will stand much higher heat than that called "Goodyear's," and is in all respects better than any in use. Proprietors of railroads do not be overcharged by pretenders.

HORACE H. DAY,
Warehouse 23 Courtlandt street.
New York, May 21, 1849.

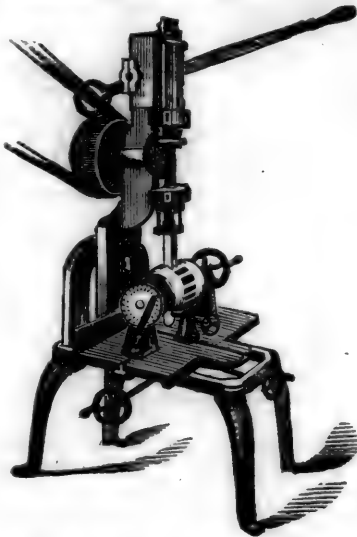
Fire Brick.

THE Subscribers have constantly on hand Rafford's Stourbridge, Oak Farms Stourbridge, Lister, Wortley, Red and White Welsh Fire Bricks, common and fancy shapes. Also,

ROOFING SLATES,
from the best Welch quarries, and of all sizes. Also, **COAL,**
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Pig Iron, Salt, etc., etc., for sale at the lowest market price. Apply to

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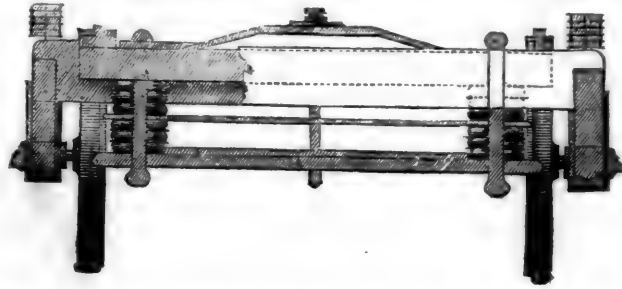
**Capt. Alfred Swingle's
PATENT BORING
& MORTISING MACHINE.**

The above Machine was invented by A. SWINGLE, of Texas, in 1846, and Letters Patent were taken out in July, 1848. As a labor saving Machine it stands unrivalled even in these days of improvements. Its uses are innumerable; it may be successfully applied to Doors, Sashes, Carriages, Wheel-Hubs, and in fact to all kinds of work where the Auger and Chisel can be brought to bear.

The only limit to the speed of the working of this machine is the heating of the tools used. It will perform at least the labor of twelve men, and in vastly better manner, and can be worked equally well by steam power or by hand. It has been used and has given universal satisfaction.

For further information apply to **H. B. TEBBETTS,**
40 Wall St., New York, to whom all orders are to be addressed.

New York, December 15, 1849.

**FULLER'S PATENT
INDIA RUBBER CAR SPRINGS.**

RAILROAD COMPANIES are cautioned, before purchasing Springs, to examine the actual patents and judge for themselves.

Persons, under the Title of the New England Car Company, seeking fraudulently to invade Fuller's rights have put forth so many statements for the purpose of misleading the public, that an enumeration of some facts is absolutely necessary, for the purpose of putting persons interested upon their guard.

Fuller's patent is for the application of Discs of India-rubber with Metal Plates, for forming Springs for Railway Cars and Carriages—either one disc and two plates, or ten discs and plates, or any other number, are equally covered by the patent. Fuller is not bound to the use of short discs—he may use long discs and plates.

Ray's patent is simply and wholly the forming of air-tight rubber cylinders, with hoops or bands round the outside, and the combination of elasticity of India rubber, with the elasticity of atmospheric air confined in the cylinder, and in no part of his patent is he authorized to use the form of spring which he is now fraudulently supplying to Railroad Companies. Such springs are direct and positive infringements of the very letter of Fuller's patent.

Fuller's patent is dated October, 1845, Ray's patent, August, 1848.

The spring patented by Ray never has been put in operation, and never can be made useful for Railroad cars.

A mere experiment, even if made, it is well known does not prove an invention; and it is ridiculous for such parties to hope to mislead the Presidents and Superintendents of Railroad companies, by claiming the invention because Ray alleges he made an experiment—which Fuller had made before him—had actually brought into working order, and obtained a patent for—and this too before Mr. Ray states he made his experiment—and that experiment not claimed to have been applied to a car or carriage.

Besides, the invention could not have been developed until India rubber, properly Vulcanised, could be made of a sufficient thickness. In the United States the art of vulcanising rubber by steam heat, (by which

means only can a body of rubber having any considerable thickness be vulcanised,) was not introduced until after the grant by the American government of the patent for springs to Fuller—whereas the process of vulcanising rubber by steam heat was invented in England about three years previously, and was used by Fuller there. This fact refutes entirely the claim of invention put forth by Mr. Ray, and proves the impossibility of his pretensions being true.

Fuller was the first and only inventor of the spring. A Mr. Dorr, whose connection with Mr. Goodyear is well known in this country, applied in England to Mr. Fuller, after he had published and patented his invention, and introduced another party for the purpose of obtaining the agency for the United States. They were furnished with a complete set of drawings and models, and with instructions to make arrangements for the supply of material of American manufacture—from that hour to the present not a single communication has been received from them. Some of these identical models have been traced into the hands of parties now seeking to invade Fuller's rights, and who have exhibited them as specimens of their own invention.

After this, the conveyance was made by Goodyear to certain parties here for the use for railroad springs of what he calls his Metallic rubber. Comment is unnecessary.

There are 5 or 6 different processes for the manufacture of vulcanised rubber, patented by as many different parties, some here, some in England, either of which would probably make good springs.

A large and powerful company has been organised under Fuller's patent, the particulars of which shall be given very shortly.

An action has been commenced against three railroad companies for infringement; and all other parties will assuredly be prosecuted if they continue farther to infringe upon Fuller's patent.

W. C. FULLER,

The only persons authorised to supply the Springs are **G. M. KNEVITT,** 38 Broadway, N. York,
General Agent for the U. S.; and
JAS. LEE & Co., 18 India Wharf, Boston.
JOHN THORNLEY, Chestnut st., Philad.

**Arch St. Machine Shop.
BIRKENBINE, MARTIN & TROTTER,**

Makers of

**STEAM ENGINES,
and
HYDRAULIC MACHINERY,
NO. 16 ARCH STREET,
PHILADELPHIA,**

Will construct Steam Engines, Pumps, for Draining Mines and Land; supplying Water to Towns, Factories, Farms, etc;

Also, Street Stops, Fire Plugs, Water Tanks, and Hydraulic Rams, with
(BIRKENBINE'S PATENT VALVES.)

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NO. 14 OLD YORK ROAD, PHILADELPHIA.
Importer and manufacturer of

New Castle }
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Cocaheo } the recent improvements.

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Patent compressed } sizes.

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Burr Blocks, Bolting Cloths, Mill Irons, etc.

**To the Proprietors of Rolling
Mills and Iron Works.**

THE Undersigned—Proprietors of Townsend's Furnace and Machine Shop, Albany—are extensively engaged in the manufacture of Machinery and fixtures for Iron, and Copper Rolling Mills, and Iron Works. Having paid particular attention to the manufacture of *Rolls* (Rollers), both *chilled* and *dry-sand*, they feel confident that they can execute orders for such castings in a satisfactory manner. And to give assurance of this, they beg leave to refer to the following named persons, proprietors and managers of some of the most extensive rolling mills in the country, viz: Jno. F. Winslow, J. Tuckerman, H. Burden, W. Burt, J. & J. Rogers, Salsus & Co., J. B. Bailey, L. G. B. Cannon, Hawkins & Atwater, etc., etc.

F. & T. TOWNSEND.

Albany, August 18, 1849.

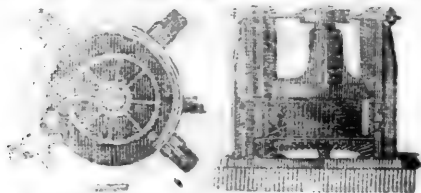
Steam Boiler Explosions.

THE Subscriber having been appointed sole Agent for Faber's Magnetic Water Gauge, is now ready to supply the trade, and also individuals with this celebrated instrument. Besides the greatest safety from explosion resulting from its use, it is a thorough check against careless stoking and feeding. In marine engines it will regulate the exact quantity required in the "blow off." Pamphlets containing full information, can be had free on application to the Agent,

JOSEPH P. PIRSSON,
Civil Engineer, 5 Wall st.

MACHINERY.

Henry Burden's Patent Revolving Shingling Machine.



THE Subscriber having recently purchased the right of this machine for the United States, now offers to make transfers of the right to run said machine, or sell to those who may be desirous to purchase the right for one or more of the States.

This machine is now in successful operation in ten or twelve iron works in and about the vicinity of Pittsburgh, also at Phoenixville and Reading, Pa., Covington Iron Works, Md., Troy Rolling Mills, and Troy Iron and Nail Factory, Troy, N. Y., where it has given universal satisfaction.

Its advantages over the ordinary Forge Hammer are numerous: considerable saving in first cost; saving in power; the entire saving of shingler's, or hammerman's wages, as no attendance whatever is necessary, it being entirely self-acting; saving in time from the quantity of work done, as one machine is capable of working the iron from sixty puddling furnaces; saving of waste, as nothing but the scoria is thrown off, and that most effectually; saving of staffs, as none are used or required. The time required to furnish a bloom being only about six seconds, the scoria has no time to set, consequently is got rid of much easier than when allowed to congeal as under the hammer. The iron being discharged from the machine so hot, rolls better and is much easier on the rollers and machinery. The bars roll rounder, and are much better finished. The subscriber feels confident that persons who will examine for themselves the machinery in operation, will find it possesses more advantages than have been enumerated. For further particulars address the subscriber at Troy, N. Y. P. A. BURDEN.

Railroad Spikes and Wrought Iron Fastenings.

THE TROY IRON AND NAIL FACTORY, exclusive owner of all Henry Burden's Patented Machinery for making Spikes, have facilities for manufacturing large quantities upon short notice, and of a quality unsurpassed.

Wrought Iron Chairs, Clamps, Keys and Bolts for Railroad fastenings, also made to order. A full assortment of Ship and Boat Spikes always on hand.

All orders addressed to the Agent at the Factory will receive immediate attention.

P. A. BURDEN, Agent,
Troy Iron and Nail Factory, Troy, N. Y.

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CHILLED RAILROAD WHEELS.—THE UNDesigned are now prepared to manufacture their Improved Corrugated Car Wheels, or Wheels with any form of spokes or discs, by a new process which prevents all strain on the metal, such as is produced in all other chilled wheels, by the manner of casting and cooling. By this new method of manufacture, the hubs of all kinds of wheels may be made whole—that is, without dividing them into sections—thus rendering the expense of banding unnecessary; and the wheels subjected to this process will be much stronger than those of the same size and weight, when made in the ordinary way.

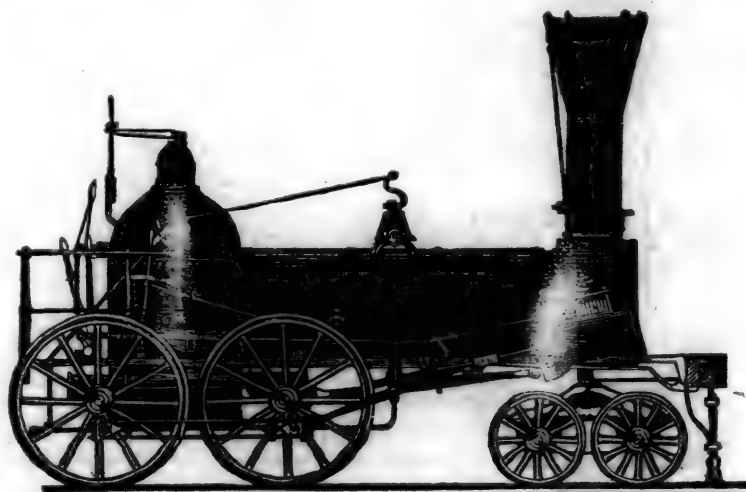
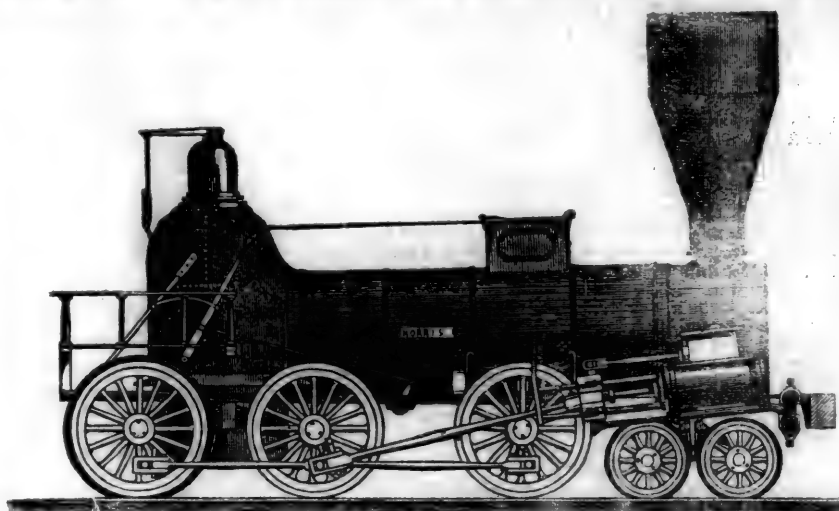
A. WHITNEY & SON,
Willow St., below 13th,
Philadelphia, Pa.

CHILLED RAILROAD WHEELS.—THE UNDesigned, the Original Inventor of the Plate Wheel with solid hub, is prepared to execute all orders for the same, promptly and faithfully, and solicits a share of the patronage for those kind of wheels which are now so much preferred, and which he originally produced after a large expenditure of time and money.

A. TIERS,
Point Pleasant Foundry.

He also offers to furnish Rolling Mill Castings, and other Mill Gearing, with promptness, having, he believes, the largest stock of such patterns to be found in the country.

Kensington, Philadelphia Co.,
March 12, 1848.

NORRIS' LOCOMOTIVE WORKS.
BUSHHILL, SCHUYLKILL SIXTH-ST., PHILADELPHIA,

THE UNDERSIGNED Manufacture to order Locomotive Steam Engines of any plan or size. Their shops being enlarged, and their arrangements considerably extended to facilitate the speedy execution of work in this branch, they can offer to Railway Companies unusual advantages for prompt delivery of Machinery of superior workmanship and finish.

Connected with the Locomotive business, they are also prepared to furnish, at short notice, Chilled Wheels for Cars of superior quality.

Wrought Iron Tyres made of any required size—the exact diameter of the Wheel Centre, being given, the Tyres are made to fit on same without the necessity of turning out inside.

Iron and Brass castings, Axles, etc., fitted up complete with Trucks or otherwise.

NORRIS, BROTHERS

LAWRENCE'S ROSENDALE HYDRAULIC Cement. This Cement is warranted equal to any manufactured in this country, and has been pronounced superior to Francis' "Roman." Its value for Aqueducts, Locks, Bridges, Flooms, and all Masonry exposed to dampness, is well known, as it sets immediately under water, and increases in solidity for years. For sale in lots to suit purchasers, in tight papered barrels, by

JOHN W. LAWRENCE,
142 Front-street, New York.

Orders for the above will be received and promptly attended to at this office. 32 ly.

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The Troy Iron and Nail Factory have all ways on hand a general assortment of Horse Shoes, made from Refined American Iron.

Four sizes being made, it will be well for those ordering to remember that the size of the shoe increases as the numbers—No. 1 being the smallest.

P. A. BURDEN, Agent,
Troy Iron and Nail Factory, Troy, N. Y.

Text Book of Mechanical Drawing,

FOR the use of SCHOOLS and SELF-INSTRUCTION, containing,

1st. A series of progressive practical problems in Geometry, with full explanations, couched in plain and simple terms; showing also the construction of the parallel ruler, plane scales and protractor.

2d. Examples for drawing plans, sections and elevations of Buildings and Machinery, the mode of drawing elevations from circular and polygonal plans, and the drawing of Roman and Grecian Mouldings.

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AMERICAN RAILROAD JOURNAL.

STEAM NAVIGATION, COMMERCE, MINING, MANUFACTURES.

HENRY V. POOR, Editor.

ESTABLISHED 1831.

PUBLISHED WEEKLY, AT No. 136 NASSAU ST., NEW YORK, AT FIVE DOLLARS PER ANNUM IN ADVANCE.

SECOND QUARTO SERIES, VOL. VI., No. 2]

SATURDAY, JANUARY 12, 1850.

[WHOLE No. 707, VOL. XXIII.

ASSISTANT EDITORS,

J. T. HODGE, *For Mining and Metallurgy.*
GEN. CHAS. T. JAMES, *For Manufactures and the
Mechanic Arts.*
M. BUTT HEWSON, C. E., *For Civil Engineering.*

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American Railroad Journal.

PUBLISHED BY J. H. SCHULTZ & Co., 136 NASSAU ST.

Saturday, January 12, 1850.

[*Foreign Correspondence of the Railroad Journal.*]
LONDON, Dec. 3d, 1849.

H. V. Poor, Esq.:

Dear Sir—Instead of remaining in England for a considerable length of time, as we expected on our arrival, we shall on account of the extreme unpleasant weather at this season, hasten to the most southern point we intend to visit, and thence return leisurely as the season advances. This arrangement will defer our examination of this country, and of course any amount of its public works till the spring, when we can pursue our inquiries under more favorable auspices. At present the weather here is such as we know nothing of in America. In addition to cold and damp, which will on short exposure completely chill one, the dense volumes of smoke and fog mingled together, almost entirely exclude the sun, which we have seen but twice in 11 days after daylight, till nearly ten o'clock, and close it at three P. M. More than once the darkness has been so great at mid-day that we could not distinguish objects across the street. The streets were all lighted as at night, and we were unable to take lunch without candles. And yet we are told

that so far from being unusual in London, it is often worse, inasmuch as cabs and carriages cannot move at all during the day, without a man to precede them bearing a lantern, and then at no faster pace than a walk. All this may be quite endurable to Englishmen who are used to it, but I prefer to see England if possible in a better light.

Railways are in exceedingly bad odor here at the present time. All confidence in the stock as a safe and profitable investment, seems to be gone.—One extreme usually follows another, and the depressed condition of railway stocks is but the natural result of the speculative mania for railways which preceded it—aggravated much, it must be confessed, by inexcusable extravagance, gross mismanagement, and even fraud on the part of directors of several important companies. Unwearying confidence, which siezed upon and pushed forward every project for a railway with hardly an inquiry as to its feasibility, is very naturally succeeded by a general and indiscriminate distrust, which turns a deaf ear upon all similar projects, and refuses anything like a fair bid for the stock of those which are completed.

The stock of the Southeastern railway company for instance, one of the most important lines connecting London with the continent by Folkestone and Dover, and lying through a fine agricultural district, now brings 17 to 17½ pounds sterling. Its par value is (33) thirty-three pounds, and it has sold as high as forty-five pounds the share, and even more than that. The price now is probably almost as much below its real value as it was formerly above it.

This panic has put a stop to the construction of new lines, suspended operations on many done, and together with the small, and often no returns from manufacturing capital, has contributed much to produce the present "glut" of money seeking investment here. The gold and silver in the banks, has augmented by the very large sum of £341,494, making a total of £16,380,184. The reserved notes in the bank have increased in a still greater proportion, the amount being £11,574,395, and the amount of mercantile securities continued to diminish, notwithstanding the fall in the rate of interest. These facts show the amount of unemployed capital to be immense. Bankers will allow but one per cent. on funds, and I am told by a gentleman who is knowing to the fact that good paper can be readily discounted at 1½ per cent. Consols

are now 95½ and ½, having risen two per cent. in two weeks, which, measured by the public funds alone is an addition to the national capital of £16,000,000 sterling. With the almost unexampled amount of capital seeking investment, the low rate of interest here, the inquiry may naturally arise, why American securities of 5 and 6 per cent. are not eagerly siezed upon. The answer is substantially that made me by a gentleman who was complaining of the difficulty he found in investing large amounts of capital, which was in short this—Some American securities have proved bad, and therefore all are bad. Mississippi scrip, and that of New York city, the New England States, and the city of Boston, are put in the same category.—The first proved bad, therefore they all are—a mode of reasoning that has more claims to beauty for its conciseness than for its soundness. Liverpool city bonds are here believed to be the best security in the world, because the city is rich, and in case of failure to pay, a judgment be obtained, and property levied on: yet you will hardly find a man who invests in those securities, or seeks to do it, and for the reasons stated, who is aware that the city scrip of Boston or New York is equally good, and for precisely the same reasons. There is a strange want of intelligent dissemination in English capitalists—they seem averse to informing themselves and exercising their own judgment, preferring to let some leader decide the question for them and then to go it blind (pardon the expression) on his *ipse dixit*.

It is this propensity to follow a "lead," and their aversion to the exercise of an intelligent discriminating personal oversight of their affairs that has made capitalists the ready dupes of railway speculations—have enabled directors of railways to so misdirect them, and which now dooms railway stocks to the same indiscriminate distrust.

The suspension of railway construction must press heavily upon the manufacturers of rails.—They have already suffered in common with the manufacturing interest generally. The diminished demand at home for rails, and the animated struggle which the bonded interest is preparing to make at the coming session of Parliament for the re-enactment of duty upon foreign breadstuffs, and in which struggle they feel confident of success, offer them no very flattering prospect for the coming year, and will most likely prevent any material improvement upon present prices, unless per-

chance the prospect, that the American buyers will impose a duty upon railroad iron, should make an increased demand for it, in which case prices may go up for a time; but otherwise many of the works will most likely in whole or part suspend operations, as some have already done.

The annexation movements in Canada seem still to attract very little attention. The opposition papers occasionally ask what such silence means; but I judge the general feeling is to let the Canadians do about as they please. J. M. A.

For the American Railroad Journal.

Glimpses at Liverpool as it was and is, with hints at the causes of its growth and commercial importance, etc.

LIVERPOOL.

"Nurse of Art! the city reared

In beauteous pride, her tower encircled head:
Then Commerce brought into the public walk
The busy merchant; the big warehouse built;
Raised the strong crane; choked up the loaded street

With foreign plenty; and thy stream O! Mersey,
Chose for a grand resort!"

More than two hundred years ago this city was described as "the little creek of Liverpool," and I find in its history that as far back as 1565 it contained 690 inhabitants, 138 houses and owned 12 vessels of two hundred and twenty-three tons burden in the aggregate. A house (probably a cottage) rented for four shillings per year, and ten pounds sterling (less than fifty dollars) was the purchase price of one of them. Wheat then sold for one shilling a bushel, a fat sheep for two shillings and six pence, and the laborer obtained four pence per day for his labor.

In 1709 its population was still less than 8,000. Its number of vessels was 84; its tonnage 5,789.

What a contrast does the present Liverpool make with this picture. From an unimportant village it has grown more rapidly, perhaps, than any town in Europe to great commercial importance and wealth. It is second only to London in the British empire. Then there were no docks to protect her vessels; no spirit for commercial enterprise. Now on the contrary her docks extend for miles along the river side, literally presenting "a forest of masts," and her thousand ships plough every ocean and bring to her port the products of every clime. Her streets, then so few, and dirty, and narrow, now multiplied by hundreds, are wide, clear, and inhabited by an intelligent population of more than the quarter of a million.

It is estimated that she carries on four-fifths the trade between Great Britain and the United States, and one-fourth the trade of the British empire.

The amount of her exports and imports do not fall short of £45,000,000 per annum, while that of the United Kingdom amounted in 1846 to £223,840,551, those of Liverpool being about one-fifth the whole. In the same year the number of her vessels was 1461, their aggregate tonnage 387,008 tons. The gross revenue collected at the port for that year £3,622,056.

The following table exhibiting the number of vessels entered at this port from 1812 to 1845, shows with what rapid and steady strides her commerce has increased.

Years.	Vessels.	Tonnage.
1812.....	4,559	446,788
1815.....	6,440	709,849
1820.....	7,276	805,033
1825.....	10,837	1,223,820
1830.....	11,214	1,411,964
1835.....	13,941	1,768,426
1840.....	15,998	2,445,708
1845.....	20,521	3,016,531

To those who are striving to build up cities in the new world it may not be uninteresting to enquire what causes have conspired to promote the growth of Liverpool, and make it a rival even of London, the great commercial city of the world, which has been petted by special legislation and government patronage, while the former has been obliged to rely upon its own resources.

In answer to the inquiry, I should say, 1st. The energy and enterprise of her merchants. Since 1708, when they constructed the first wet dock in this kingdom if not in the world to the present time, they have allowed no advantage to escape unimproved. This town was formerly a mere dependency of Chester, but as the river gradually filled up, impeding its commerce, the merchants of Liverpool improved their harbor, and finally took the whole trade from their less enterprising neighbors of Chester.

Formerly the slave trade presented an opportunity for profitable adventure, and more credit to their sagacity than their morality perhaps. They embarked in it extensively. But this nefarious source of profit was taken from them by the abolition of the slave trade in 1806, at which time they had 111 vessels of 25,949 tons burden in the aggregate engaged in the trade. They also engaged extensively in privateering during the French and American wars, having in 1779, 120 vessels thus employed.

They were first to join hands with their friends across the Atlantic in establishing lines of sailing packets, by which they secured regular communication between their city and New York. There are 24 packet ships of from 700 to 1000 tons burden, each of which ply between these places, sailing from each port on the 1st, 6th, 11th, 16th, 21st and 26th of every month.

They were first also to embark in ocean steam navigation, and their success has been worthy of their enterprise. But while these and various other projects have engaged their attention, no means have been left untried, no expense spared, that would increase their business or facilitate its transaction.

The utmost freedom was early given to enterprise by abolishing all exclusive laws, and every encouragement held out to the various branches of industry.

The natural advantages of Liverpool are great. While its location is not unfavorable to commerce with the various foreign countries, its central situation in the kingdom, and proximity to Ireland, point to it as the great entrepot of the two countries.

It is also surrounded by such towns as Manchester, Oldham, Berry, Bolton, Ashton, Nantwick, and other manufacturing towns, for which it imports cotton and other articles, and from which it receives the manufactured fabrics that supply the markets of the world. Its climate, though humid, is favorable to business, in winter being six degrees warmer than the same latitude on the eastern coast, and in summer cool and pleasant.

But the merchants of Liverpool did not rest her, and their success, alone upon what nature had done for them. A judicious system of canals, and later still of railroads, was completed, by which she connected herself with all parts of the kingdom, and drew to herself a fresh increase of business. Her docks have been increased and improved yearly, till the wet docks now number more than 20, covering the space of one hundred and seventy-four acres, and affording fourteen miles of quay space; exclusive of the new dock now building, and the

dry docks which cover twenty acres. These docks are protected by a substantial sea wall, built of rough hewn stone four miles in extent, and are superior to any in the world, except those of London. Liverpool has profited with almost Yankee tact by several incidental advantages.

The adoption of the warehousing system enabled her at once to put her docks and warehouses into profitable use, which was done so successfully as to give her almost the advantages of a free port.

Subsequently, the partial opening of the East India trade, and latterly the entire abolition of the East India company's monopoly, has opened to her merchants a field of enterprise which they have taken good care to improve.

Liverpool having now formed commercial ties with the principal cities of the world, and attained a position in which she is second to but one city in the empire, may now without presumption aspire to be the first. Her naturally favorable position, her magnificent artificial facilities, her enterprising merchants, her skilful engineers, her cheap and inexhaustible supply of coal, constitute elements of power which, with the new agency of steam that is extending its conquests over the world, will in the next half century enable her to take the crown from London as queen of commerce, and compete perhaps successfully (though I hope and believe not), with her trans-Atlantic sister, New York, which is now fairly enlisted as competitor for this magnificent prize. It is worth a contest, and we may be sure neither will yield the palm without an effort worthy of themselves.

An Account of the Construction of the Britannia and Conway Tubular Bridges.

Continued from page 11.

"At this time, July 19-21, a considerable number of experiments had been made—nearly the whole of the cylindrical tubes had been tested, and preparations were then in progress for the rectangular and elliptical forms. The difficulties experienced in retaining the cylindrical tubes in shape when submitted to severe strains, naturally suggested the rectangular form; many new models of this kind were prepared and experimented upon before the end of July; and others with different thicknesses of the top and bottom plates or flanges, before the 6th of August. This is clearly indicated by the date of the experiments, and the letter of August 6, addressed as before to Mr. Stephenson. This letter, it will be observed, strongly enforces the striking and unmistakable evidence, afforded by the experiments, of the necessity of a close adherence to the principle of the simple beam or girder. Up to this time my object has been to test the principle, originally suggested by Mr. Stephenson, of a structure, every part of which, although rigid, should be brought into a state of tension, and whose strength should consist, not as that of a beam or girder does, in its resistance to extension on the one side and to compression on the other, but in a resistance to extension on both sides. For the adoption of such a form, if it could have been found, there was this plausible argument: that the tenacity of wrought iron being much greater than its resistance to compression, there would obviously have been an economy of the material in so shaping the tube as to call into action its tenacity only. All my attempts to find such a shape as this were, however, fruitless. Every experiment gave the most certain evidence of a compression on the one side of the tube and extension on the other, and it yielded alike when the one resistance or the other was overcome. From this time the question presented itself, therefore, under a simpler form. I looked upon the tube as a hollow girder, whose strength was dependent upon the same causes as that of any other, and I saw plainly the direction my experiments should take and the principle by which I was to be guided. That determined opposition which I shall be found in this correspondence to have given to the use of chains or any other flex-

ible auxiliary for the support of the tube, dates of the same thickness, but the middle part, z , may from this period.

"MILLWALL, August 6, 1845.

My Dear Sir: For the last eight days I have been constantly employed on the experiments, and although some of them have not always indicated the results expected, they are nevertheless not only useful as regards the object of our research, but highly satisfactory. From these investigations we derive several important facts, one of which I may mention, namely, the difficulty of bringing the upper, as well as the lower side of the bridge, into the tensile strain. For this object several changes were effected, and attempts made to distribute the forces equally, or in certain proportions throughout the parts, but without effect, the results being in every experiment that of a hollow beam or girder, resisting, in the usual way, by the compression of the upper and extension of the lower sides. In almost every instance we have found the resistance opposed to compression the weakest, the upper side generally giving way from the severity of the strain in that direction. These facts are important so far as they have given rise to a new series of experiments, calculated to stiffen or render more rigid the upper part of the tube, as well as to equalize the strain, which, in our present construction, is evidently too great for the resisting forces of compression. I entertained hopes of seeing you here before now, as I was anxious to show you the more interesting portion of the experiments, and to have had the benefit of your suggestions and advice. As it is, and under present circumstances, I trust I have your permission to pursue the inquiry, and to introduce such new forms and combinations as will fully determine the law of resistance, and also the strongest form of tube, when acted upon by a force calculated to crush or tear it asunder. I am leaving by this evening's train for Manchester, and will again return to the experiments in about a fortnight, or as soon as the addition tubes are prepared; in the meantime you will probably report progress, as some of the directors and secretaries were here on Saturday for that purpose.

"I am, etc.,

W. FAIRBAIN.

"R. Stephenson, Esq., C. E."

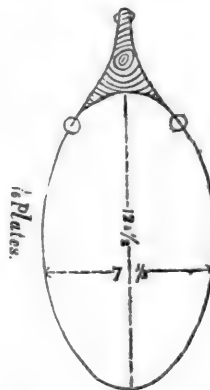
"It will be seen by this letter that the weakness of the tube had been recognised in its upper surface which yielded to compression before the under side was upon the point of yielding to extension; and that the course which the experiments henceforth took of so strengthening the upper surface, that it should not be on the point of yielding to compression until the under surface was about to yield to extension, had been already shaped out. This state of the tube was a condition necessary to the greatest economy of its material, for in any state in which it was not on the point of yielding on the one side at the instant it was on the point of yielding on the other, some of the material might be taken from the stronger side without causing that to yield, and added to the weaker so as to prevent that side from yielding, and thus the tube would be rendered stronger by a new distribution of its material. It was with a reference to this principle that the rectangular form of section had suggested itself to me, in the place of the circular or the elliptical forms proposed by Mr. Stephenson, and that I had ordered the top of the tube to be thickened. It now occurred to me that the top might be strengthened more effectually by other means than by thickening it, and I addressed the following letter to my son, four days after the date of the last, directing him to cause two additional tubes to be constructed, the one rectangular and the other elliptical, with hollow triangular cells or fins to prevent crushing. These experiments led to the trial of the rectangular form of tube with a corrugated top, the superior strength of which decided me to adopt that cellular structure of the top of the tube which ultimately merged in a single row of rectangular cells. It is this cellular structure which gives to the bridges, now standing across the Conway straits their principal element of strength.

"MANCHESTER, August 10, 1845.

I shall require the following models made. One of this kind (see fig. 4), composed of plates 1-16th of an inch thick, the top, a, a , to be made of plates

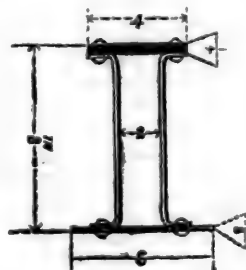
be left out, and filled up with wood, to give the top side stiffness. The joints of the plates below to be carefully made, with a stronger piece, double riveted, over these, in order to cause the plates to be torn asunder instead of the joint. The top, a, a , to be firmly riveted to the tube all the way along as shown at b, b . Another of the same kind to be made of the same length and thickness of plates, but of this shape (see fig. 5), 19 feet 6 inches long.

Fig. 5.



These may be made out of some of the old ones, after proper drawings have been taken of them.—To be crushed or torn asunder with the weights suspended from the inside, as before. Also, one small beam (see fig. 6), 12 feet long, as under:—

Fig. 6.



Thickness of top plate $\frac{1}{4}$ of an inch; sides 1-16th of an inch; bottom $\frac{1}{4}$ of an inch. I think these will be all we shall require at present; and as soon as you are ready let me know, and I will be with you to see them tested. I am, etc.,

W. FAIRBAIN.

'T. Fairbairn, Esq.

"The experiments had now assumed a shape which seemed to me to require the assistance of a mathematician who should deduce, if that were possible, a formula which, from the observed strength of a tube of a lesser, might enable me to calculate the strength of one of a greater size; and

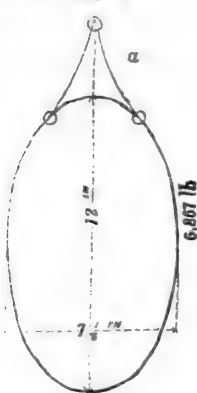
conceiving that Mr. Hodgkinson, now Professor at University college, would not object to undertake the discussion of such a formula, I applied to him to do so, and invited him to Millwall to witness some of the experiments then in progress. Mr. Hodgkinson did not visit Millwall till the following month, being at that time engaged in testing some railway bars at the British iron works, South Wales.

"During Mr. Hodgkinson's first visit to Millwall (September 19, 1845) the whole of the experiments which had then been concluded were explained to him, and he carefully examined the apparatus which I had used. On the first day of his visit, the tubes which had been constructed with single hollow or cellular tops were experimented on. The forms of these tubes, and the results of the experiments upon them, are communicated to Mr. Stephenson in my letter of the 20th September, which follows. One of them had a piece of fir timber fitted in the cell or fin, with a view to keep that part in form, and prevent its losing shape from the crushing force; but in consequence of the difficulty which was experienced in making the timber accurately fill the whole space, it proved of little value. Superior results were however obtained from the increased surfaces which were offered to compression on the top sides by the fins, and my attention was naturally directed to the question, how far it was possible, by some other arrangement, better to accomplish the object of the cellular structure. Immediately upon the completion of the experiments on the 'fin' tubes, I ordered the preparation of another form with a corrugated top, resembling in section the eyes of a pair of spectacles, rightly anticipating from this form of tube a considerable increase of strength. The cellular form of top offered, however, according to the experiments already made, such decided advantages, that in the following letter I ventured to anticipate, even at this early period, an ultimate cellular form of section for the great bridge itself, and proposed to Mr. Stephenson two ideas, the one of a tube with a series of square cells on the top, as at a, a , (see fig. 9), and the other with a number of circular pipes having flat plates riveted to their tops and bottoms, as shown at Δ (see fig. 10). The reader will not fail to observe how much the first of these sketches resembles the tubes actually constructed for the Conway and Britannia bridges. The whole of the arrangements for our subsequent proceedings were pointed out at the time to Mr. Hodgkinson, and appeared to meet with his approval.

"[Private.]—MILLWALL, Sept. 20, 1845.

My Dear Sir: I have been uninterruptedly employed on the experiments for the whole of this week, and for two days I have had the benefit of the presence and assistance of my friend Mr. Hodgkinson. According to his views, as well as my own, we are progressing satisfactorily; and although we have not as yet arrived at the strongest form of tube, we are nevertheless approaching that desideratum. You will be aware, on referring to my last letter, that the great difficulty we had to encounter was a due proportion of the parts, so as to neutralize or render the two resisting forces of compression and extension equal; out of nine experiments on cylindrical tubes, two failed by crushing in at the top, and seven by tearing asunder at the rivet holes. The latter were, however, fractured, owing to the closeness of the rivet holes and the construction of the tubes, the foreman having omitted to cross the joints. From eleven experiments on rectangular tubes, eight yielded to the crushing force, and three only were torn asunder by extension. The elliptical or egg shaped tubes invariably failed, with only one exception, by compression; four having been crushed in at the top, and only one torn asunder at the bottom. Collectively, these appeared to indicate weakness on the upper side of the tube, and a necessity for a change of form in order to give stiffness and rigidity to that part. To counteract the forces of compression I got two tubes constructed of the annexed forms: one elliptical, with a deep fin, a, a , on the top, and the other rectangular, with a similar fin at b , as per annexed sectional sketch. These were according to the dimensions here marked, the one 12 by 7 $\frac{1}{4}$ inches, and the other 13 by 8 inches, and 18 feet 6 inches between the supports. The plates were 1-

Fig. 7.



16th of an inch thick, and the tubes broke or were

Fig. 8.



crushed respectively with dead weights of 6867 lbs. and 8812 lbs.

To be continued.

Institution of Mechanical Engineers.

At a meeting of the above institution held at Birmingham, November 24th, R. Stephenson, Esq., M. P., in the chair, the following papers were read:

On the Economy of Railway Transit.—By Mr. James Samuel, of the Eastern Counties railway.

The object of the paper was to show the necessity of working branch lines with lighter and less expensive trains and locomotives than are at present in use, with a view to diminish first cost, consumption of coke, and deterioration of permanent way. By returns of the number of passengers conveyed on the Eastern Counties and Norfolk railways, they showed that the greatest number of passengers in any main line train at any one time was 231, and the least number 7; the greatest number in any of the branch line trains being 82, and the least number 3. And that there were conveyed on the Eastern Counties Branch lines during the year 1847, 42,644 tons of passengers (calculating each passenger with his luggage at 168 lbs.), and that the weight of engines and carriages required to convey them was about 1,112,500 tons, being in the proportion of 26 to 1.

The main line engines consumed from 24½ to 40½ lbs. of coke per mile, and the engines for working the branch line trains consumed from 16½ to 35½ lbs. per mile, varying of course with the size of the engine employed to do the work, the smallest engines invariably consuming the smallest quantity of fuel for the same work done. The average consumption of coke during the half year ending 4th July, 1849, was 31½ lbs. per mile for passenger engines, and 47½ lbs. per mile for goods engines.—These returns refer to a stock of about 200 engines, and a length of line of about 310 miles.

Thus the writer came to the conclusion that it would be possible to construct a carriage and engine combined, of sufficient capacity for branch traffic, and by his advice the directors of the Eastern Counties railway gave orders to Mr. Adams to construct such a carriage, subject to the approval

of Mr. Hunter, the locomotive superintendent.

The carriage was accordingly built, and called the Enfield, from the branch which she was intended to work. The engine has 8 inch cylinders, and 19 inch stroke; driving wheels 5 feet diameter; distance between centres 20 feet; width of framing 8 feet 6 inches. The boiler is of the ordinary locomotive construction, 5 feet long by 2 feet 6 in. diameter. The fire box is 2 feet 10½ inches by 2 feet 6 inches. There are 115 tubes of 1½ inch diameter and 5 feet 3 inches in length, giving a total of 230 feet heating surface in the tubes. The area of the fire box is 25 feet, giving a total heating surface of 255 feet. The weight of this steam carriage is 15 tons 7 cwt. in working trim. The engine and carriage being combined, it is evident that the weight on the driving wheels is increased by the load carried, and that this weight increases in the same ratio as the load required to be taken.—The extreme distance between the centres of the leading and trailing wheels being 20 feet, accounts for the steadiness of this machine; there is indeed no perceptible oscillation when travelling at the highest speed, and this verifies the observation that "the steadiness of an engine depends not on the position of the driving wheel, but upon the length of the rectangle covered by the wheels." This engine at the same time daily traverses curves of 5 or 6 chains radius.

The Enfield steam carriage was originally intended to convey 84 passengers, but as it was found that when she was put on as an express train the passengers increased in number, a North Woolwich carriage was attached capable of conveying 117 passengers, and also a guard's break van, making provision altogether for 150 passengers, which is now her regular train taken at a speed of 37 miles per hour.

This engine commenced her regular work about eight months since, and the following return shows the miles run and coke consumed by this engine during the 7½ months' regular working from January 29th to September 9th, 1849.

14,021 total miles run.	743 cwt. coke consumed
	[in running.
	408 cwt. coke consumed
	[in standing.
705 hours running time.	286 cwt. coke consumed
	[in getting up steam.
1,457 hours standing time.	

	1,434 cwt. total coke consumed.
	[summed.
2,162 total hours in steam.	11.48 lbs. per mile average consumption of coke.

The Enfield is in steam 15 hours per day, the fire being lighted about 6 in the morning and drawn at 10 o'clock at night. But of these 15 hours it appears by the return that she is engaged running only 5 hours, the remaining ten being employed standing in the siding. It was found by experiment that the quantity of coke consumed standing was 32 lbs. per hour, and after deducting this and the quantity consumed getting up steam, it will appear that the actual consumption of coke running is under 6 lbs. per mile. It must also be particularly borne in mind that this consumption of coke includes the total goods and coal traffic on the branch amounting to 1,410 tons, viz: 169 tons of goods and 1,241 tons of coal.

The Enfield steam carriage worked the 10 a. m. passenger train from London to Ely on 14th June, a distance of 72 miles, taking behind her three of the ordinary carriages and two horse boxes; she arrived at Ely 8 minutes before time, and the total consumption of fuel, including the getting up steam, was found to be 8½ lbs. per mile. The tubes of the boiler are only 5 feet 3 inches in length, and the economy of fuel is consequently scarcely at a maximum.

Another engine on a similar plan to couple with a 40 feet carriage is now nearly ready, the tubes being 6 feet 6 inches long, from which is expected even more economical results.

The result of the writer's experience is the conviction, that for express purposes, and for the larger portion of the branch traffic on railways, the light steam carriage is the best adapted and most economical machine, both as to first cost compared to the work done, and in working expenses.

The first cost of a large engine, tender and four carriages has been £4,000. The steam carriage

for the same number can be made for something less than one half the cost.

Remarks.—Mr. McConnell gave much credit to Mr. Samuel for the introduction of this branch traffic carriage. If managers of railways could always calculate the number of passengers to be carried, he (Mr. McConnell) could conceive that a great economy might be effected, even under the present system. But this was impossible. How far, under these circumstances, Mr. Samuel's carriage might become useful, he was not prepared to say. Undoubtedly with the present carriages the proportion of the tare to the passengers carried was very great; and although a case which rarely happened, instances had occurred where the tare was 50 tons to 3 tons of passengers. But even taking the weight of passengers at 10 tons, 50 tons of carriages was unquestionably a large proportion of dead weight to carry; and he considered that the long carriage, if always likely to be well employed would be an advantageous mode of saving the dead weight, more especially on branch lines, and at the junctions where such branches came in.

Mr. Samuel further explained, that as the length of coupling of the engine wheels in the Enfield was only 5 feet 4 inches, with an 8 inch cylinder, it was necessary to attach the carriage and engine on one frame, otherwise it would be too short to run steadily; the effect produced by the carriage was like the stick of a rocket in steadying the motion. But in the Cork and Bandon engine with a 9 inch cylinder, the length of coupling of the wheels was 10 feet, and no carriage was required to produce steadiness, as the rectangle on the rails was so much longer. In the case of large engines, where the distance between the axles had been increased to 66 feet, a greater steadiness was observable.—

There was accommodation in the carriage for 15 first class and 116 other passengers, giving a total accommodation for 131 passengers; and this he considered the most serviceable for working the express traffic. One of these steam carriages was being prepared for working on a railway in Scotland, at a contemplated speed of 40 miles an hour. At the present time it was impossible to keep the road in good repair, especially on the old lines, in consequence of the enormous weight of the engines. The Enfield engine was worked at 120 lbs. pressure, while in ordinary engines it did not exceed 80 lbs., and hence an advantage of 40 lbs was obtained.—The heating surface of the fire box was 25 ft. He had, with the Enfield engine, made the quickest journey ever performed between Norwich and London. With a train capable of containing 84 passengers they performed the distance of 126 miles in 3 hours 35 minutes, including stoppages. Another advantage in a large carriage of this description resulted from making use of the side space, for there were only 8 wheels to do the work of 24, and at the same time they had no greater amount of weight on each wheel than under the ordinary system. The whole weight was 9 tons without passengers, and 85 passengers might be taken at an average as weighing 6 tons.

The President considered that they were much indebted to Mr. Samuel for his excellent paper, and he regretted that many interested in the economical working of railways had absented themselves from that meeting. The subject of economical transit had, of course, occupied his attention, and he must say that, although he considered the suggestion of Mr. Samuel, so far as certain branch lines were concerned, was entitled to the consideration of all railway companies, yet he (the President) did not agree with Mr. Samuel to the full extent. On small local lines—such as those from London to Greenwich, and London to Blackwall—such carriages would be very valuable in lessening the expense of working, but he could not agree in thinking that for express purposes, or any other, such carriages would or should become popular on main lines. He could not agree with Mr. Samuel, also, with reference to the necessity of fixing the engine to the carriage, for the purpose of giving it steadiness. It appeared to be like riveting harness to a horse. There was no mechanical necessity for it. He would advise Mr. Samuel not to overstrain his principle by endeavoring to apply to trunk lines what would be manifestly beneficial to branches. The public expected certain comforts in railway travelling, and no system that could be

devised would reconcile passengers to be packed together like fish. He (the President) felt that, occupying as he did a position in the management of railways that might give his opinion weight, he had thought it right to say what he had done, lest he might be considered tacitly to admit that that which engineers had been doing since 1831 in increasing the weight of engines had been practically wrong.—*C. E. & A. Journal.*

Finances of Pennsylvania.

We give the following extracts from the recent Message of the Governor of this State touching its financial condition:

The consideration of the Legislature is respectfully invited to the financial condition of the Commonwealth.

The present funded debt is as follows:

6 per cent. loans.....	\$2,041,022 51
5 per cent. do.....	37,336,716 90
4½ per cent. do.....	200,000 00
	\$39,577,739 41

Unfunded debt, to wit:

Relief notes in circulation, without interest.....	\$653,164 00
In. certificates outstanding.....	179,422 91
" unclaimed.....	4,448 38

Interest on certificates to be added when the same shall be funded or paid.....	11,294 34
Domestic creditors on settlement.....	85,104 88
	\$933,434 51

Amount of canal, railroad and motive power debts, prior to Dec. 1, 1848, and unpaid by the appropriations of the last session.....	63,239 53
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Total indebtedness of the commonwealth, Dec. 1849.....	\$40,574,413 45
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The funded debt on the 1st Dec., 1848, was.....	\$39,393,350 24
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Unfunded debt.....	1,081,386 69
Amount of Canal, railroad and motive power debt, constructed prior to Dec. 1, 1848.....	367,642 38
	\$40,842,379 31

Amount of public debt paid during the year 1848, exclusive of the sum paid commissioners of the sinking fund.....	\$267,965 86
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Amount paid during the year 1849 to the commissioners of the sinking fund.....	227,513 53
--	------------

Amount appropriated during the year towards payment of public debt.....	\$495,479 39
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In exhibiting the operations of the treasury for the last fiscal year, the sum of \$130,000, borrowed on special loan for the avoidance of the Schuylkill Inclined Plane, and included in the aggregate of public debt in December, 1849, should be added to the above stated sum of \$495,479 39.

The amount of receipts at the treasury during the year ending Dec. 1, 1849, is.....	\$4,433,688 65
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The amount of expenditures during the same period is.....	4,084,771 80
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Balance in the treasury on Dec. 1, 1848.....	577,290 39
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Balance in the treasury on Dec. 1, 1849.....	826,207 24
--	------------

Amount paid to commissioners of the sinking fund to Jan. 1, 1850, \$227,513 53, with which was purchased of the funded debt, and transferred to the commonwealth.....	253,500 00
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Difference between the indebtedness of the State on the 1st Dec. 1848, and Dec. 1, 1849.....	267,965 86
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Total amount of public debt paid during the year.....	\$521,465 86
Estimates of the receipts at the treasury during the year 1850:	

From lands.....	\$20,000 00
Auction commissions.....	22,000 00
" Duties.....	50,000 00
Tax on Bank Dividends.....	130,000 00
" Corporation stocks.....	160,000 00
" Real and Personal Estate.....	1,330,000 00
" Tavern Licenses.....	80,000 00
" Retailers' Licenses.....	160,000 00
" Pedlars' Licenses.....	3,000 00
" Brokers' Licenses.....	12,000 00
" Theatre, Circus, and Menagerie Licenses.....	3,000 00
" Billiard Rooms, Bowling Saloons, Ten Pin Alley Licenses.....	5,000 00
" Distillery and Brewery Licenses.....	1,500 00
" Eating Houses, Beer Houses, and Restaurant Licenses.....	15,000 00
" Patent Medicine Licenses.....	3,000 00
" Pamphlet Laws.....	500 00
Militia Fines.....	2,000 00
Tax on Writs, Wills, Deeds, &c.....	40,000 00
" Certain Offices.....	20,000 00
" Collateral Inheritance.....	200,000 00
Canal and Railroad Tolls.....	1,825,000 00
Canal fines and sale of old materials.....	5,000 00
Enrollment of laws.....	11,000 00
Premiums on Charters.....	40,000 00
Tax on Loans.....	125,009 00
Dividends on Turnpike and Bridge Stock.....	2,000 00
Nicholson Lands.....	300 00
Accrued Interest.....	5,000 00
Refunded Cash.....	5,000 00
Escheats.....	2,000 00
Fees of Public Offices.....	2,000 00
Miscellaneous.....	2,000 00
Interest on stock purchased.....	15,000 00
	\$4,566,300 00

Estimated payments during the year 1850:	
To Public Improvements.....	\$640,000 00
Expenses of government.....	235,000 00
Militia expenses.....	4,000 00
Pensions and Gratuities.....	20,000 00
Charitable Institutions.....	80,000 00
Common Schools.....	200,000 00
Interest on Loans.....	2,005,000 00
Guarantees of Interest.....	32,500 00
Domestic Creditors.....	10,000 00
Damages on Public works.....	20,000 00
Special Commissioners.....	2,000 00
State Library.....	2,000 00
Public Buildings and Grounds.....	2,000 00
Penitentiaries.....	15,000 00
House of Refuge.....	5,000 00
Nicholson Lands.....	300 00
Escheats.....	2,000 00
Abatement of State Tax.....	40,000 00
Counsel fees and Commissions.....	2,000 00
Miscellaneous.....	5,000 00
Inclined Plane, (Schuylkill).....	270,000 50
North Branch Canal.....	150,000 00
Commissioner's Sinking Fund.....	293,000 00
	\$4,034,800 00
	\$531,500 00

The foregoing estimated balance in the treasury at the end of the fiscal year 1850, would appear to justify the appropriation of \$40,000 towards the completion of the Western reservoir at Johnstown, as hereinafter recommended. It would also authorize the appropriation of a sum not less than \$300,000, in addition to the amount already appropriated, to be expended in the completion of the North Branch canal.

The Legislature at its last session authorized the re-issue of the relief notes then in circulation, and suspended their cancellation for three years.

The amount of the whole issue now outstanding is.....	\$653,164 00
The amount paid into the treasury and supplied by a new issue is.....	442,537 00

Balance.....	\$200,927 00
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The above balance has been destroyed, or has failed to reach the treasury during the year. These notes, the redemption of which being amply secured, and affording a safe and convenient local currency, have the confidence and favor of the citizens. It is therefore recommended that authority be given to the proper officers, to keep them in good condition by a new issue, in lieu of such as may become mutilated and defected.

In addition to the suggestions made to the last Legislature on the subject of the monied affairs of the state, it is deemed proper to call your attention to the fact, that a portion of the funded debt is over due; a part bearing an interest of six per cent, and a part falling due the year 1850, as follows:

The amount of five per cent. funded debt over due, except bank charter loans, is.....	\$354,519 10
The amount of six per cent. funded debt over due is.....	1,752,335 06
The amount of five per cent. funded debt falling due on or before Dec. 1, 1850, is.....	999,211 15
The amount of unfunded debt, now due.....	65,104 88

Amount demandable at the treasury during the year.....	\$3,191,170 19
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Principal Towns in Indiana.

Chamberlain's Indiana Gazeteer, gives the following statistical information in regard to some of the principal towns in Indiana:—

Towns.	Business Houses.	Churches.	Laid out.	Pop.
Indianapolis.....	121	17	1821	6,506
Madison, not rep.....		15	1808	7,000
New Albany.....	120	11	1813	7,000
Lafayette.....	78	9	1825	7,000
Evansville, not rep.....		7	1816	5,000
Richmond.....		9	1816	3,000
Terre Haute.....	70	9	1816	3,500
Fort Wayne, not rep.....		8	—	5,000

The amount of taxes paid to the State in 1848, by the several counties in which these are located, upon the lands taxable in each, is as follows:

Indianapolis, Marion County.....	\$12,239 17
Madison, Jefferson.....	11,092 64
New Albany, Floyd.....	6,823 43
Lafayette, Tippecanoe.....	9,643 68
Evansville, Vanderburg.....	5,515 27
Richmond, Wayne.....	17,690 01
Terre Haute, Vigo.....	8,962 67
Fort Wayne, Allen.....	5,790 87

Foreign Coal.

We have received from Washington the following official statement of the amount and value of coal imported into the United States during the year ending on the 30th of June, 1849:

From England.....	tons. 63,079	value \$156,154
Scotland.....	1,469	2,721
Ireland.....	600	1,437
British Am. Colonies.....	131,565	245,693
Other places.....	1,500	3,277

Total.....	198,213	\$409,255
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The following table shows the imports of Foreign coal into the United States, annually, from 1821 to the 1st July, 1849. The duty on foreign coal under the present tariff is 30 to 45 cents per ton, on board:

1821.....	22,122	1836.....	108,432
1822.....	34,523	1837.....	153,450
1823.....	30,433	1838.....	129,083
1824.....	7,228	1839.....	181,551
1825.....	25,645	1840.....	162,867
1826.....	35,665	1841.....	155,394
1827.....	40,257	1842.....	141,526
1828.....	32,302	1843.....	41,163
1829.....	45,393	1844.....	87,073
1830.....	58,136	1845.....	85,771
1831.....	36,508	1846*.....	156,855
1832.....	72,978	1847.....	148,021
1833.....	92,432	1848.....	196,251
1834.....	71,628	1849.....	196,213
1835.....	49,969		

* From 1st December, 1846, to 30th June, 1847.

† For the year ending 30th June, 1848.

Anthracite Coal Trade.

Table showing the quantity of Coal sent to Market annually, from its commencement, in 1820, to 1849, inclusive.

Years.	PREPARED FROM OFFICIAL DOCUMENTS.							Total Supply. Tons.	Increase & Decrease. Tons.
	Total Lehigh. Tons.	Total Schuylkill. Tons.	Lacka- wanna. Tons.	Pine Grove. Tons.	Lykens Valley. Tons.	Shamo- kin. Tons.	Wyo- ming. Tons.		
1820.....	365							365	
1821.....	1,073							1,073	708 I
1822.....	2,441							2,440	1,161 I
1823.....	5,823							5,823	5,583 I
1824.....	9,541							9,541	3,718 I
1825.....	28,396	6,500						34,896	25,355 I
1826.....	31,280	16,767						48,047	13,151 I
1827.....	32,047	31,360						63,434	15,387 I
1828.....	30,232	47,284						77,516	14,082 I
1829.....	25,110	79,973	7,000					112,083	35,567 I
1830.....	41,750	89,984	42,700					174,734	62,351 I
1831.....	40,966	81,854	54,000					176,820	2,386 I
1832.....	75,000	209,271	84,500					368,771	191,951 I
1833.....	123,000	252,971	111,777					487,748	118,977 I
1834.....	106,244	226,692	43,700					376,636	72,112 D
1835.....	131,250	339,508	98,845	5,500				575,103	198,467 I
1836.....	146,522	432,045	104,500	9,978	5,439			698,484	123,381 I
1837.....	225,937	523,152	115,387	15,726	6,430			887,632	189,148 I
1838.....	214,211	433,875	76,321	16,665	6,005	4,104		746,181	141,451 D
1839.....	222,042	442,608	122,300	19,227	5,372	11,390		823,479	77,298 I
1840.....	225,591	452,291	149,470	19,463	5,302	15,298		867,045	43,566 I
1841.....	142,807*	585,542	192,270	15,306	6,176	22,154		964,255	97,210 I
1842.....	271,913	541,504	205,253	31,437	181	10,098	47,346	1,107,732	143,477 I
1843.....	267,125	677,313	227,505	22,879		9,870	57,740	1,262,532	154,800 I
1844.....	376,363	840,379	251,005	27,719		13,087	114,906	1,623,459	360,927 I
1845.....	430,993	1,076,068	266,072	31,208		10,135	178,401	2,002,877	379,418 I
1846.....	522,518	1,236,581	318,400	55,346		12,646	188,003	2,333,494	330,617 I
1847.....	643,568	1,572,794	388,200	61,233		14,904	289,898	2,970,597	637,103 I
1848.....	680,193	1,652,834	434,267	56,938	2,000	19,357	237,271	2,082,860	112,263 I
1849.....	800,987	1,605,626	454,240	78,299	250,000	49,658	258,080	3,235,777	159,030 I

ed, to \$62,315,701. A tabular statement contained in the last annual report, shows a gradual increase of revenue within ten years \$41,558 31, in 1840, to \$138,013 66, in 1848, a gain, in receipts, in favor of the latter year of \$96,455 29. In the same report it is remarked, "that the average increase of each year over the preceding, has been such, that at no greater rate of progress, the company must in a few years pay the current interest upon its debt, and may look forward to an entire extrication from its embarrassments." The President of the companies in a communication of the date of the fifteenth of October last, in reply to a letter from me, of an earlier date, says, "In estimating the resources of the state for the ensuing year, I think you may assume with certainty that the state will receive punctually the current interest from these companies;" and further, "whilst, therefore, I am loth to promise anything, the failure to perform which, though without our control, would look like a breach of faith, I can express to you the expectations honestly entertained, that we shall be able next year, besides the payment of our current interest, to make a decided impression upon the arrears." The Susquehanna and Tide Water canal companies, may, therefore, I think, be confidently relied upon to continue the punctual payment of the annual interest due from them to the Treasury, and in the absence of any unforeseen casualty, not only to discharge the unfunded arrears of interest, but to apply a portion of their earnings towards the redemption of the debt incurred, for their benefit, by the state.

The two last named reports of the Chesapeake and Ohio canal company are herewith transmitted. I regret to be obliged to communicate to you the unwelcome intelligence that, notwithstanding the most confident assurances heretofore given, the canal has not yet reached its destined terminus at the town of Cumberland; nor am I in possession of any reliable information as to the period of time, at which its final completion may be certainly expected. The interest of the state in this corporation consists of

Investments as unpreferred stockholder.....	\$622,000 00
Investments as preferred creditor and stockholder.....	6,572,666 66
Preferred claim, for interest paid....	3,645,943 75

Total.....\$10,840,610 41

From the above statement it will appear that the state has embarked her capital and credit to an infinitely greater extent in this, than in any other like work of internal improvement; and if the success which has hitherto attended upon its management, is to be regarded as the best indication of its future utility, there is reason to fear that, without an essential change of system, the hopes and anticipations which the people of Maryland have been taught to cherish in reference to the fruits of this enterprise, if not doomed to perpetual disappointment, are at least liable to be indefinitely deferred.

A review of the past history and progress of this work, in its transactions with the state, may serve to admonish those who have the largest stake in its success, of the entire inefficiency of the existing system of control, and of the consequent necessity of devising some other plan, for the more effectual protection of the public interests. The Chesapeake and Ohio canal company was incorporated by the Legislature of Virginia, in the year 1824, with a capital of six millions of dollars, and its object was the construction of a navigable canal, from the tide water in the District of Columbia to the Ohio river at Pittsburg. At the December session, 1824, of the Legislature of Maryland, the Virginia charter was re-enacted and confirmed, and it was also subsequently adopted by the state of Pennsylvania. Although the cost of the canal from Georgetown to Cumberland, as ascertained by a distinguished engineer, then in the service of the government, was estimated at more than nine millions of dollars, it was not found difficult to procure estimates from other quarters deemed reliable, reducing the cost of construction between these points, to four millions five hundred thousand dollars. To this unfortunate commencement may be traced that fatal system of false, if not fraudulent estimates and profigate expenditures, by which the state of Maryland

was finally plunged into a debt on account of this work, the principal of which now exceeds seven millions of dollars. To the capital stock of the company there was subscribed and paid in by the General Government \$99,990 00, by the state of Virginia \$250,000, by the city of Washington \$1,600,000, by Georgetown and Alexandria \$500,000, by the state of Maryland \$500,000, and by private subscriptions \$457,518 36, making a total of \$3,707,508 36, when on the 4th day of July, 1828, the work was commenced with an ostentation which was thought to befit the magnitude of the undertaking. But scarcely had one hundred and four, out of the one hundred and eighty four miles (the distance between Georgetown and Cumberland) been completed, when the year 1834 was called upon to witness the exhaustion of the Company's means, the fallacy of the revised estimates and the consequent suspension of the work itself. Deserted by the United States, the state of Virginia and the district cities, the whole burden of its completion was now thrown upon the state of Maryland, and no means were left unassayed by the agents of the country to convince the legislature that, while the most unlimited profits were to accrue to the state by the prosecution of the work to Cumberland, the additional sum of two millions of dollars would prove amply sufficient, to carry it to that town before the expiration of eighteen months, or at farthest, two years. A committee, at the head of which was the then president of the canal company "appointed to prepare an estimate of the probable cost, and the time required for the completion of the canal." In their report of the date of the 28th of January, 1835, submitted to the Legislature confidently state that the 78 miles below Cumberland, remaining to be placed upon contract, will require two millions," and, "as to the time which should be allowed for the completion of the eastern section, past experience assures the friends of the canal, that if the entire line of 78 miles were placed under contract, eighteen months or two years, at most, would suffice for that object." Deluded by these representations, the General Assembly, at the December session, 1834, loaned to the company two million State of Maryland six per cent. bonds, reserving a right to convert the amount into stock, upon the completion of the canal to Cumberland.

Comparative Expenses of Railroads.

I have been looking over the annual reports of the railroads in this commonwealth for the years 1846, '47, and '48, for the purpose of contrasting the expenses of wood and stone (sleeper) roads. I forward you for publication the result of my comparison in reference to the Providence, Worcester and Lowell roads, which were opened about the same time, the two former having wooden, and the latter stone sleepers. The statement embraces the three years above mentioned:

REPAIRS, RENEWALS OF IRON, &c.				
	Providence.	Worcester.	Lowell.	Total 3 Av. p years. mile.
1846.	16,318	34,946	36,160	28
1847.	14,279	60,962	47,072	45
1848.	23,785	44,679	49,391	84
	54,382	140,587	132,623	
REPAIRS OF STATION BUILDINGS.				
	Providence.	Worcester.	Lowell.	Total 3 years.
1846.	3,633	3,986	26,587	2,824
1847.	2,763	3,916	26,524	3,696
1848.	2,077	3,186	16,649	23,253
	8,472	11,088	69,760	
NEW ENGINES AND CARS FOR DEPRECIATION.				
	Providence.	Worcester.	Lowell.	Total 3 years.
1846.	13,000	10,125	27,507	8,962
1847.	13,000	10,125	22,388	10,125
1848.	825	30,375	30,170	26,655
	26,825	50,625	79,965	
RECAPITULATION.				
	Road-way.	Sta-tions.	Engines & cars.	Total 3 Mls. years. track.
1846.	54,382	8,472	26,825	63
1847.	140,587	11,088	30,375	103
1848.	132,623	69,760	79,965	53

GENERAL RESULT.

For 3 yrs. on Providence, of 63 miles, \$1,423 per m.
" Worcester, 103 " 1,767 "
" Lowell 53 " 5,227 "

It will be seen by the above statement that in the items mentioned, the expenses during the three years, of the Providence and Worcester roads together, (embracing 166 miles of track) were more than 11,000 dollars less than those of the Lowell road (of 53 miles of track.)

New York.

CANAL DEBT.

The amount of the canal debt chargeable upon the sinking fund created by sec. 1, art. 7 of the constitution, was on the 30th Sept., 1849, as follows:

Erie canal enlargement.....	\$8,127,386 94
Chemung canal.....	509,452 34
Crooked Lake canal.....	120,000 00
Chenango canal.....	51,362 00
Black River canal.....	1,208,011 35
Genesee Valley canal.....	3,084,623 38
Oneida Lake canal.....	50,000 00
Oneida river improvement.....	59,843 56
To provide for deficiencies under art. 7 of the constitution.....	3,153,844 10

Canal debt paying interest.....16,364,523 67

To the above amount should be added the new debt of \$50,000, created in pursuance of the act providing for extraordinary repairs and improvements, passed April 5th, 1849, on which the interest being \$3,000 per annum, must be provided for from other sources than the canal revenues. It is for the legislature to determine whether this interest shall be supplied from the revenues of the general fund, or by setting apart a sufficient portion of the moneys received from premiums on loans.

The principal of the canal debt was diminished during the past fiscal year, by payments from the canal sinking fund, \$310,375 24, and increased 50,000 by the new loan above referred to, making the actual reduction as follows:

Principal of debt, Sept. 30, 1848, paying interest.....	\$16,674,898 91
Principal of debt, Sept. 30, 1849, paying interest.....	16,414,523 67

Diminution.....260,375 24

The aggregate amount of the canal debt, including the new loan of \$50,000 above referred to, was on the 30th of Sept., 1849, \$16,414,523 67.

GENERAL FUND DEBT SINKING FUND.

Amount received into the treasury....	\$357,000 00
Deficiency in the fund on the 30th September, 1848.....	1,008 97
Amount of payments from the treasury (see statement B).....	436,442 00
Am't transferred to the general fund revenue, for one year's interest on \$117,675 63.....	7,060 53
	344,511 50

Surplus of the sinking fund 30th Sept. 1849.....12,488 50

Add to this interest on \$30,000, of new debt created for the erection of the New York arsenal, to be refunded from the general fund revenue.....1,026 66

And it shows an actual surplus of....13,515 16

To this fund belongs a certificate of stock issued on account of the bank fund, redeemable 1st February, 1856, and held by the treasurer in trust for said fund: it being the amount appropriated from the canal revenues to this fund from the 1st June to 30th Sept., 1846, for which the commissioners of the canal fund assigned to the treasurer, said stock in lieu of the payment of the money into the treasury for that period.....\$116,666 66

In order to meet the demands upon this fund, there have been advances made from the treasury, and there remained a balance due the general fund revenue, on the 30th September, 1849, of.....104,178 16

Leaving the amount of the fund on the 30th Sept., 1849.....12,488 50

For the purpose of adjusting this matter between the sinking fund and the general fund revenue accounts, it has been suggested in former reports from this office, that the comptroller be authorized to invest out of moneys in the treasury belonging to the specific funds, a sum equal to that of the bank fund stock, and that said stock be transferred to him in trust for said funds. This stock bears six per cent. interest, and as little or no doubt exists as to the

sufficiency of the contributions by the banks to meet its redemption, it would be a safe investment for these funds.

CANAL DEBT SINKING FUND.

<i>Received.</i>	
Balance on hand, 30th Sept., 1848....	\$153,944 40
Transferred from the fund to redeem Erie and Champlain canal stock....	160 00
Transferred from the fund to redeem Chenango canal stock.....	600 00
Proceeds of loan to supply deficiencies—amount of principal.....	1,739,024 73
Received for interest on investments....	7,774 28
Transferred from the revenues of the State canals, under art. 7, sec. 1, of the constitution.....	1,300,000 00
Total receipts.....	3,201,503 44
<i>Paid.</i>	
For the redemption of 5's of 1845....	600 00
" " 7's of 1848....	37,391 00
" " 5's of 1849....	71,886 00
" " 7's of 1849....	1,987,452 00
For accrued interest on investments....	2,101 38
<i>For expenses of transfer office, viz:</i>	
To the Manhattan company.....	1,250
To Walter Mead, agent.....	750
For account books, & engraving plates, etc.....	597
	2,597 00
For interest on the canal debt.....	898,599 05
Total payments.....	3,000,626 43
Balance on hand 30th September, 1849	200,877 01
	3,201,503 44
<i>The above balance is applicable as follows, viz:</i>	
To redeem 6's of 1837 outstanding....	160 00
" 7's of 1849 ".....	600 00
" 7's of 1849 ".....	74,948 00
" 5's of 1849 ".....	15,114 00
	pay-
ing no interest.....	90,822 00
For the fiscal year 1849-50.....	110,057 01
	\$200,877 01

AMERICAN RAILROAD JOURNAL.

Saturday, January 13, 1850.

Maine.

Railroad Meeting at Hiram Bridge.—We are informed that the meeting at Hiram Bridge on Tuesday last, in reference to the contemplated railroad from the State line on Saco river, to some point on the York and Cumberland railroad, was large and the proceedings highly interesting. Peleg Wadsworth of Hiram, was chosen chairman, and Messrs Barrows of Fryburg and Usher of Hollis, secretaries. Wm. H. Noble, Esq., the engineer, made a favorable report, and the meeting was addressed by Messrs. F. O. J. Smith, of Westbrook, McArthur, of Limington, Cowan, of Saco, and others. Committees were selected from the several towns to confer with citizens on the line in reference to the further prosecution of the matter. A vote was taken to publish the report, and an account of the proceedings of the meeting, which we shall endeavor to lay before our readers as soon as practicable.

Maine.

York and Cumberland Railroad.—The stockholders of this company held a meeting at Alfred, on the 3d inst., to adopt measures for completing the western termination of the road. There was a large attendance, and an enthusiastic determination was evinced to put the road through speedily. The stockholders were also satisfied that, if done at all, it must be done by *home effort*, and without the aid of Boston capital.

F. O. J. Smith, Esq., on behalf of the directors, guaranteed that, if a subscription of \$550,000 could

be secured, including the amount already taken, the road should be completed in 18 months.

Committees were appointed to apportion the amount each town should raise, as above suggested. The following amounts were reported and accepted:

Hollis \$30,000, Waterboro' 20,000, Lyman 10,000, Alfred 40,000, Sanford 30,000, North Berwick 15,000, S. Berwick 15,000, Berwick 10,000, Lebanon 5,000, Shaleigh 5,000, Acton 5,000, Limerick 10,000, Newfield 5,000, Limington 15,000, Cornish 2,000, Parsonsfield 10,000, Buxton 10,000, Baldwin 5,000, Standish 5,000, Gorham 50,000, Westbrook 70,000, Portland 150,000, other towns 33,000.

The meeting adjourned to assemble at the same place February 6th, at 10 o'clock, a. m., to receive the reports of the gentlemen to whom the obtaining of the above subscriptions is committed. There are also to be meetings of the friends of the enterprise at the Meeting House at Buxton on Lower Corner, on Thursday, the 17th inst. at 10 o'clock a. m., and at Spring vale, in Sanford, on Wednesday the 23d inst. at 10 o'clock a. m.

A more painful duty has seldom devolved on us, either as a public journalist or private individual, than that of announcing to our readers the melancholy death of John Howard Kyan, Esq. Mr. Kyan was found dead in his boarding house in this city on the 5th instant: a coroner's inquest held in the course of that day, found that his death had been caused by apoplexy. On the 7th instant he was followed to the grave by a number of friends who met him here, amongst whom were J. W. Francis, an eminent physician of this city, Alfred W. Craven, Chief Engineer of the Croton Aqueduct, I. W. Gibbons, an English gentleman staying in this city, Jas. K. Casey, an English gentleman resident here, H. V. Poor Esq., Editor of the Railroad Journal, Walter H. Ferrier and M. Butt Hewson, Civil Engineers, etc.

Mr. Kyan was a native of Ireland, having been born in the county of Wicklaw in that country, where he was the owner, amongst other real estate of the royalties, of some very valuable mines.—The kyanizing of timber was invented by Mr. Kyan, and has made his name familiar to most of the practical constructors both here & in Europe. His treatise on the 'Elements of Light,' full of new and bold ideas, marks Mr. Kyan as an original investigator of depth and compass. He was a man of marked intelligence, and of an energy of character not to be deterred from even coming here in the pursuit of business at the advanced age of 75 years. He leaves a wife and 9 sons and daughters to be shocked by the news of their sad bereavement.

Few men were susceptible of warmer friendships than the late John Howard Kyan. His hair was gray; but his heart was green: a patriarch in years, he was a boy in affections. With a portly commanding person, and fresh benevolent countenance, he was truly a fine specimen of the Irish 'gentleman.'

Courty in his manners and bearing, intelligent in his views, warm in his feelings, gracefully buoyant in his spirits he was at once venerated and loved. Bitter, bitter must be the loss of a man so esteemed by friends who knew him for but a short time, to those who stood towards him in the more tender relation of wife, son daughter. He was honored and distinguished in his life, and now that he has passed from amongst us, the peace of God rests upon his spirit.

Georgia.

Central Railroad and Banking Co.

We have the report of the President and Directors of this road for the year ending November 30, 1849.

The earnings for the year ending as above have been.....\$668,383 91

The ordinary working expenses and maintenance of road and machinery amount to the sum of...\$333,193 75

Extraordinary expenses... 4,435 12

337,628 87

Making the net earnings for the year. 330,755 04

The whole cash receipts during the year from road and bank, are as follows:

From road earnings prior to 1st Dec.

1848.....\$28,274 92

From road earnings since that date... 572,368 53

600,643 45

From earnings of bank.....

26,489 82

627,133 27

And those cash receipts have been disposed of as follows, to wit:

Road expenses as above...337,628 82

Bank expenses..... 6,472 00

Interest on bonds..... 7,612 92

June and December dividends.....

189,366 00

541,079 79

86,053 48

Amount paid out for cars. 27,200 00

" rebuilding 17

miles of the road.....20,168 14

47,368 19

Leaving a surplus of..... 33,685 39

This has been carried to the reserve fund which now amounts to \$70,918 97.

Since the last annual report there have been purchased 6508 tons of the heavy rail, of the T pattern, for relaying the road. About 4500 tons have already arrived. There has been paid on account of rails and connecting plates, the sum of \$77,804, and the company will be called on soon for about the sum of \$120,000, and in the course of the ensuing six months for 110,000. There has been sold, of the guaranteed 8 per cent. stock, last authorised by the stockholders to be issued, \$114,900, and the books are again open for the sale of an additional sum of \$150,000. The payments for iron and rebuilding the road have been, and will be thus secured.

About 17 miles of new heavy rails have been laid, and after the first day of January next the work of relaying will go on much more rapidly than during the past year. So soon as the new iron is laid down, the annual working expenses will, comparatively, be very considerably diminished. The board confidently expect that at least 70 miles of the road will be renewed and laid with the heavy bar, in the course of the next year.

The road is stated to be in excellent repair at this time, and its condition is constantly improving. On the first day of January last, the system of road repairs was changed from a contract system to a working by negroes hired by the company, and the board state that the repairs under the new system have been more thorough. They do not doubt that the new plan will be more effective, as well as economical. The company anticipate large additions to its business from the opening of the South Western and Burke County railroads; the object of the former being to open a railway communica-

tion between Savannah and the Chattahoochee river, and the latter to connect the Central railroad with Augusta. Fifty miles of the former will be opened within the year. The central railroad subscribed 250,000 dollars to the stock of the South Western railroad, for the purpose of aiding a work so important to its interest, and to that of Savannah. It is believed that this subscription will prove a profitable investment of capital, in addition to the other objects that induced it.

The completion of the several roads now in progress in this State will open to almost every portion of it means of easy access to market. Cheapness of transportation is as much an element in the wealth of an agricultural section of the country, as fertility of soil. The latter may be entirely unavailable without the former. The time is not far distant when every planter in Georgia will be within convenient distance of a railroad, and consequently of a market at all seasons of the year.

At the present time, most of the cotton grown in the Southern States must be forwarded to market at certain seasons of the year, when the rivers are navigable. This necessity throws the whole crop upon the market at once, and the supply at such times being much greater than the demand, the price falls in consequence. After the crop reaches tide water, the planter can better afford to sell at reduced price than pay the various charges to which it is necessarily subject. The construction of a railroad by enabling planters to forward their cotton whenever there is a remunerative demand, will, to a certain extent, prevent the supply exceeding the demand. In a word, it places the planter in the position of making his own terms, and takes this privilege from the speculator and consumer who has heretofore enjoyed it.

STATEMENT SHOWING THE RESOURCES OF THE COMPANY.

Railroad appurtenances.....	\$2,635,650 88
Notes and bills discounted.....	264,811 04
Bills receivable.....	40,232 30
Bills on North.....	109,869 32
Bonds City of Savannah.....	11,000 00
Stock—Bank state Georgia.....	20,000 00
“ S.W. Railroad Co.....	165,000 00
“ Savannah and N. York steam pack-ets.....	51,000 00
Banking houses and lots.....	17,896 82
Real estate taken for debt.....	915 90
Due by other Banks, other company and ag'ts.....	97,414 05
Washington and N. O. Tel. Co.....	318 40
Protests.....	95 75
Balance betw'n principal B'k and late agency.....	15 18
Specie.....	39,290 40
Cash balance due from northern banks.....	92,521 61
Notes of other banks.....	7,342 00
	139,154 01
	\$3,553,373 65

LIABILITIES.

Capital paid in.....	\$2,694,717 50
Unpaid instalments.....	1,182 50
Circulation.....	190,393 00
Bonds—8 per cent.....	207 00
Bonds—7 per cent.....	172,600 00
Suspense account.....	3,500 00
South Western railroad co.....	53,418 63

Brooks and Barden.....	1,966 27
Due to other banks.....	55,387 58
Due to agent.....	92
Unclaimed Dividends.....	16,792 26
Individual deposits.....	94,808 02
Dividend declared this day.....	97,581 00
Balance being reserved fund.....	70,918 97

\$3,553,373 65

* Equal to 3½ per cent. semi-annual.

Virginia.

Gratifying Intelligence.—We have the liveliest satisfaction in announcing that the board of public works on Tuesday last, subscribed, on the part of the State, for the full amount, as authorised by the act as it now stands, to the stock of the Virginia and Tennessee railroad. The sum now subscribed is \$900,000, but the state is bound to the amount of 1,636,000 dollars. We have not less pleasure in announcing that the Governor has appointed John M. Preston, Esq., of Abingdon, as the proxy to represent the State. The southwest can now rest assured that its interests will be zealously guarded by her trusted son, and we speak what we know, when we say that no appointment could have been made more entirely acceptable to our citizens, and to the board of Directors of the company, than that of Mr. Preston. His intelligence, high character, and consistent devotion to the cause, afford abundant guaranty that he will discharge his duty with exclusive reference to the best interests of the great work.—*Lynchburg Virginian.*

South Side Railroad.—It will be seen from the following paragraph, which we find in the Petersburg Intelligencer, that a portion of the South Side railroad is already under contract, and that books for subscription to the stock of the Petersburg and Lynchburg railroad are to be opened on the 15th instant. We repeat our settled conviction, that by the time our road is finished to the Tennessee line Lynchburg will be connected with tide water by perhaps more than one railroad, whilst the improvements in Tennessee will, within the same period, put us in communication with the Mississippi. We hazard the prediction that before seven years, at farthest, roll round, passengers will be taken on a continuous railway from Petersburg to Memphis:—

The common Hall having given authority to do so, several of the contracts for grading the South Side railroad were let out on Saturday. Such is the great facility of the route, that the grading will be finished this year; allowed to settle next winter; and, in the spring of 1851, the work of laying the iron rails will be commenced. Contracts for other sections of the road are still open.

The commissioners to receive subscriptions to the stock of the Petersburg and Lynchburg railroad have determined to open books of subscription on the 15th of January, and have requested sub-commissioners at Farmville; at the new store in Buckingham; at Buckingham Court House; and at Appomattox Court House, to open books at as early a date as they may deem it expedient. So the ball is now fairly started for Lynchburg and will roll to that point, as speedily as a proper construction of the work will allow.—*Id.*

The stockholders of the Alexandria and Gordonsville railroad have decided upon the route of their road. It will pass through Culpepper and Orange Ct. House. The work will be put under contract forthwith.—*Id.*

STATEMENT, showing the areas of the several Land States and Territories, the amount of land disposed of by sale and otherwise, and amount unsold and undisposed of on the 30th Sept., 1849.

STATES AND Territories.	Area of the States and Territories. Sq. miles.	Surveyed up to Sept. 30, 1849.	Unsurveyed on Sept. 30, 1849.	Offered for sale up to Sept. 30, 1849.	Acres sold up to Sept. 30, 1849.	Don't and grants for schools, etc.	Grants for internal improvements.	Grants to individuals & companies.	Grants for waste gov't lands build.	Grants for military services.	Reserv'd for the benefit of Indians.	Confirmed private claims.	For acres unsold & undisposed of.
Ohio.....	39,961	25,576,960	16,770,994	16,770,994	12,541,362 84	727,536	1,181,135 47	32,141 24	2,500	1,476,117 96	24,216	26,450 80	745,751 36
Indiana.....	33,849	21,627,760	21,448,658	21,448,658	15,085,836 09	673,357	1,692,861 61	843 44	2,500	4,551,636 61	23,040	179,890 53	8,731,924 01
Illinois.....	55,405	35,450,200	35,450,200	35,450,200	15,252,541 04	1,001,705	5,000,000 00	934 64	2,500	4,281,530 30	121,629	188,901 61	14,030,396 72
Missouri.....	67,380	43,123,900	42,427,322	42,427,322	9,863,991 80	1,222,179	5,000,000 00	1,981 53	2,500	847,173 20	46,080	1,362,455 10	29,216,173 29
Alabama.....	30,722	32,462,080	31,993,813	31,993,813	10,983,122 15	925,814	5,000,000 00	1,981 53	1,620	60,000 00	23,040	213,346 65	17,228,727 39
Mississippi.....	47,151	30,176,522	30,176,522	30,176,522	4,380,836 61	860,624	5,000,000 00	15,965 31	1,280	34,882 25	27,612 04	488,083 25	14,308,757 54
Louisiana.....	46,431	29,715,840	19,020,626	19,020,626	3,276,056 29	832,124	5,000,000 00	8,413 95	1,280	151,600 00	46,080	109,300 83	22,854,462 82
Michigan.....	36,343	33,995,520	29,334,637	29,334,637	9,116,910 84	1,113,177	5,000,000 00	4,080 00	13,200	1,007,796 97	46,080	126,230 71	24,814,963 11
Arkansas.....	52,196	35,406,720	33,201,426	33,201,426	3,048,548 03	932,340	5,000,000 00	139,366 25	10,600	1,206,045 31	46,080	118,451 12	27,402,991 85
Florida.....	59,215	37,951,920	29,507,534	29,507,534	1,953,257 99	954,583	5,000,000 00	1,743,661 61	6,240	1,010 00	46,080	227 49	31,810,576 48
Iowa.....	50,918	32,584,960	16,578,869	16,578,869	15,891,128	13,235,155	5,000,000 00	1,743,661 61	6,240	1,010 00	46,080	227 49	27,153,365 28
Wisconsin.....	35,921	34,511,360	19,533,405	19,533,405	4,380,836 61	951,254	5,000,000 00	18,229 86	3,840	1,028,315 05	46,080	119,183 34	26,327,679 60
Minnesota.....	83,000	53,120,960	37,610,960	37,610,960	4,380,836 61	1,004,728	5,000,000 00	5,705 82	6,400	1,302,058 17	46,080	137,894 27	37,604,960 00
Northwest Territory.....	587,564	218,536,320	218,536,320	218,536,320	1,004,728	858,000 00	5,000,000 00	5,705 82	6,400	1,302,058 17	46,080	137,894 27	37,604,960 00
Oregon.....	341,463	87,488,000	87,488,000	87,488,000	1,004,728	858,000 00	5,000,000 00	5,705 82	6,400	1,302,058 17	46,080	137,894 27	37,604,960 00
Nebraska.....	187,171	119,789,440	119,789,440	119,789,440	1,004,728	858,000 00	5,000,000 00	5,705 82	6,400	1,302,058 17	46,080	137,894 27	37,604,960 00
Indian Territories.....	1,949,317	1,247,552,362	312,116,014	312,116,014	1,199,973	8,471,473 30	1,971,339 68	50,860	10,387,415 83	422,325	3,400,726 53	16,973,903 21	993,680,433 06

NOTES.

* Corrected to latest dates, and includes Chickasaw lands. † This amount will be increased by decision of Secretary of Treasury, of March 2, 1849. ‡ Areas as shown by plats.—N. Y. Tribune.

COMMERCE OF BOSTON.

The Courier contains a table of the arrivals at Boston for the year 1849, foreign and coastwise.—Of the foreign arrivals (3114) 2076 were British, chiefly from the British provinces. Sixty-one vessels arrived from ports east of the Cape of Good Hope, 123 from Liverpool, 305 from other European ports, 90 from various South American ports, 380 from various West India ports, 291 from Picton, 126 from St. John, 84 from Halifax, and the remainder from other ports of the British provinces. Of the coastwise arrivals, (6100) 7 were from Galveston, 241 from New Orleans, 67 from Mobile, 21 from Jacksonville, 40 from Apalachicola, 68 from Savannah, 64 from Charleston, 36 Washington, 93 Wilmington, N. C., 62 from Fredericksburg, 63 from Tangier, 37 from Alexandria, 272 from Baltimore, 1351 from Philadelphia, 55 from Rondout, 216 Albany, 559 New York, 38 Hartford, 242 Bangor, 221 Portland, 163 Bath, 126 Calais, 108 Ellsworth, 104 Thomaston, and 1025 from other ports east of Portland. This table does not include several thousand coasters which annually arrive at this port, loaded with fish, lumber, wood, etc. Probably from 14,000 to 15,000 vessels annually enter the port of Boston.

STATEMENT OF GOLD BULLION imported from California since June 1, 1849.—Coinage of Gold Bullion.

In Friday's Journal of Commerce I gave a statement of the amount of gold bullion imported into New York in six vessels, since July 1, 1849, viz:.....\$2,705,162 66 I now give a statement of five others as follows:

June 11. By U.S. store ship Lexington.....	270,000 00
" 23. By steamer Crescent City.....	490,314 00
Aug. 22. By U.S. ship Dale.....	65,000 00
" 23. By steamer Falcon.....	336,180 00
Sept. 9. By " Great Western.....	197,080 00

Total.....\$3,964,006 00 In this estimate there is one item in the imports of the Empire City, Sept. 13, in which the sum of two hundred thousand dollars is stated as brought by passengers. This deducted from the above, would leave to consignees.....\$3,764,006 66

Taking Mr. Aspinwall's estimate that as much gold bullion has been brought to New York by passengers which is not entered on the manifests, as that which is entered, we have as the gross amount of imports from June 1 to Dec. 31, 1849.....\$7,528,013 32

From July 1 to Dec. 31, 1849, the United States mint in Philadelphia have coined for Messrs. Howland & Aspinwall, of New York, from California, gold bullion, \$539,891 83.—*Jour. of Com.*

Massachusetts Stock.

DIVIDENDS TO BE PAID IN JANUARY.

We have given in our paper for the last week or two the various dividends which have been declared by the different railroad and manufacturing companies, and we have prepared below, in the following table, the amount of the same with the additions of the interest to be paid on various city and state script, and the interest on various railroad bonds, and some dividends which we have not before published. It will be seen by the table that there is to be paid out in various sums over two millions one hundred thousand dollars, which will, of course be a very acceptable new year's present to the holders, as well as afford some relief to the money market. There are some other dividends

which will yet be declared before next week, and are consequently not included in this table:

RAILROAD STOCKS.

	Capital.	Div.	Am't.
Western railroad.....	\$5,150,000	4	206,000
Fitchburg ".....	2,650,000	4	106,000
..... int on new stock.....			28,600
Boston and Lowell.....	1,830,000	4	73,200
Boston and Providence.....	3,160,000	3	94,800
Boston and Worcester.....	4,500,000	3	135,000
Taunton Branch.....	250,000	4	10,000
Pittsfield and North Adams.....	450,000	3	13,500
Dorchester and Milton.....	130,000	3	3,900
Eastern Massachusetts.....	2,850,000	4	114,000
Eastern, N. H.....	492,500	4	19,700
Boston and Maine.....	3,556,000	5 1/2	195,580
..... int. on new stock.....			3,750
Portland, Saco and Portsmouth.....	1,200,000	3	36,000
			1,040,030

INTEREST ON BONDS

Old Colony.....	\$8,220
Dorchester and Milton.....	4,000
Michigan Central.....	28,000
Cheshire.....	17,500
Vermont Central.....	9,000
Vermont and Massachusetts.....	16,000
Albany [W. R.].....	30,000
Western Railroad Sinking Fund.....	50,000
	\$162,220

MANUFACTURING STOCKS.

Chicopee.....	700,000	3	21,000
Salmon Falls.....	500,000	3	15,000
Cabot.....	500,000	4	20,000
Nashua.....	1,000,000	4	40,000
Jackson.....	480,000	4	19,200
Stark Mills.....	1,000,000	2 1/2	25,000
Monadnock.....	120,000	4	4,800
Lowell.....on 1900 shares.....	\$20		38,000
Cochecho.....on 2000 shares.....	\$26		52,000
Manchester Print Works.....	1,200,000	4	48,000
New England Worsted.....	480,000	5	22,000
			\$305,000

LAKE COMMERCE.

Collections et Custom Houses from Chicago to Ogdensburg, up to December 1st, 1849:	
District of Chicago.....	\$4,349 79
" Cape Vincent.....	2,778 58
" Sandusky and Cleveland.....	1,096 60
" Detroit.....	7,846 60
" Oswegatchie and Ogdensburg.....	5,802 05
" S. Harbor.....	4,100 00
" Buffalo and Erie.....	38,280 49
" Genesee and Rochester.....	13,906 03
	\$78,189 14

Collection from the port of Oswego from the 1st of March to 31st Dec., 1849... 90,542 50 Collected above brought down..... 78,189 14

An excess of.....\$12,353 36 collected at Oswego beyond all other ports (American) on this chain of lakes.

W. HARMAN, Dep. Collector.

Custom House, Oswego, Jan. 1, 1850.

Indiana.

New Albany and Salem Railroad.—The New Albany Bulletin gives the following gratifying statement of the progress of this work:

We mentioned in the fall that the work had been let from Salem to White River, which made sixty five miles in all from New Albany. The work on that part of the road being light, it has been done with surprising promptness—one half of the route from Salem to Orleans being now ready for the superstructure.

We understand that a contract was concluded on Wednesday last with Messrs. Doolittle & Chamberlain for all the grading, masonry, bridging, etc. of all the line from the east fork of White river to Gosport, a distance of about 50 miles. This contract includes the bridging of the two White rivers

and amounts in all to about \$320,000. They are required to finish the work to Bedford by the 1st of January, 1851, to Bloomington by the 1st of October, 1851, and to Gosport by the first of July, 1852.

We have now one hundred and fifteen miles of railroad under contract. That which has just been let is the most heavy and difficult portion of the whole work.

The means of the company are ample to finish and furnish the road to Orleans, 56 miles, and to grade and prepare for the iron the remainder of the road to Gosport.

We have no hesitation in saying that, within three years, the road will be extended and completed to Lafayette, with a branch running to Indianapolis. The books will be opened in the spring to these extension.

Foreign Commerce of the U. S.

We extract from the New York Courier and Enquirer the following condensed statement of the commerce and navigation of the United States with foreign countries, for the fiscal year ending the 30th June, 1849. It is taken from the official report of the Register of the Treasury, laid before the Senate on the 26th ult. It contains matters of great interest to all classes of our citizens, respecting the increased trade of our country, and will well repay a careful examination.

Statement of the total value of goods, wares and merchandise, imported into the United States in American and foreign vessels, during the year ending 30th of June, 1849.

	In American vessels.	In foreign vessels.	Total.
Paying duties.....	\$103,293,220	22,186,554	125,479,774
Free from ".....	17,088,932	5,288,733	22,377,665

Total value..\$120,382,152 27,475,287 147,857,439 Statement of the total commerce of the U. States, from 1st July, 1848, to 30th June, 1849.

Value of Exports, Domestic Produce.

In American vessels.....	\$91,363,303
In foreign vessels.....	41,304,647
Total.....	132,666,950

Foreign Produce.

In American vessels.....	9,169,815
In foreign vessels.....	3,919,050
Total.....	13,088,865

Total American and foreign produce..145,755,820

Value of Imports.

In American vessels.....	120,382,152
In foreign vessels.....	27,475,287
Total.....	147,857,439

Summary statement of the value of domestic exports during the year ending June 30, 1849.

THE SEA.

Dried fish or cod fisheries.....	419,092
Pickled fish, or river fisheries.....	93,085
Whale and other fish oil.....	965,597
Spermaceti oil.....	572,763
Whalebone.....	337,714
Sperm candles.....	159,403
Total.....	2,547,654

THE FOREST.

Skins and furs.....	656,228
Ginseng.....	182,966
Staves, shingles, boats, hewn timber.....	1,776,749
Other lumber.....	60,314
Masts and spars.....	87,720
Oak bark and other dye.....	95,392
All manufactures of wood.....	1,697,828
Naval stores, tar, pitch, rosin and turpentine.....	845,164
Ashes, pot and pearl.....	515,603
Total.....	5,917,994

AGRICULTURE.

Beef, tallow, hides, horned cattle.....	2,053,358
Butter and cheese.....	1,654,157
Pork, (pickled) bacon, lard & live hogs.....	9,245,885
Horses and mules.....	96,982

Sheep.....	16,305
Wool.....	81,015
Wheat.....	1,756,848
Flour.....	11,280,582
Indian corn.....	7,966,369
Indian meal.....	1,169,625
Rye meal.....	218,248
Rye, oats and other small grain & pulse.....	139,793
Biscuit or ship bread.....	361,318
Potatoes.....	83,313
Apples.....	93,904
Rice.....	2,569,362
Tobacco.....	5,804,207
Cotton.....	66,396,967
Hemp.....	8,458
Flaxseed.....	4
Hops.....	29,123
Brown sugar.....	24,906
Indigo.....	49

Total.....111,059,378

MANUFACTORIES.

Soap and tallow candles.....	627,280
Leather, boots and shoes.....	151,774
Household furniture.....	237,342
Coaches and other carriages.....	95,923
Hats.....	64,967
Saddlery.....	37,276
Wax.....	121,720
Spirits from grain.....	67,129
Beer, ale, porter and cider.....	51,320
Snuff and tobacco.....	613,044
Linseed oil and spirits of turpentine.....	148,056
Cordage.....	41,636
Iron, pig, bar and nails.....	149,358
Castings.....	60,175
All manufactory of iron.....	886,629
Spirits from molasses.....	288,452
Sugar refined.....	129,001
Chocolate.....	1,941
Gunpowder.....	131,297
Copper and brass.....	66,203
Med. drugs.....	220,894
Cotton, printed and colored.....	466,574
" white.....	3,955,117
" Nankeen.....	3,202
" twist, yarn and thread.....	92,555
All manuf. of cotton.....	415,680
Flax and hemp, cloth and thread.....	1,000
Bags and all manuf. of do.....	4,544
Wearing apparel.....	75,945
Combs and buttons.....	38,136
Brushes.....	2,944
Billiard tables.....	701
Umbrellas and parasols.....	5,800
Leather and Morocco skins (not sold per lb.....	9,427
Fire engines and apparatus.....	458
Printing presses and type.....	28,031
Musical instruments.....	23,713
Books and maps.....	94,427
Paper and stationery.....	86,827
Paints and varnish.....	55,145
Vinegar.....	14,036
Earthenware and stoneware.....	10,632
Manufactured glass.....	101,419
" tin.....	13,143
" pewter and lead.....	13,196
" marble and stone.....	20,282
" gold and silver and gold leaf.....	4,502
Gold and silver coin.....	956,874
Artificial flowers and jewelry.....	8,557
Molasses.....	7,442
Trunks.....	5,699
Brick and lime.....	8,671
Salt.....	82,972
Total.....	10,798,473
Coal.....	40,396
Lead.....	30,198
Ice.....	95,027
Total.....	165,621

ARTICLES NOT ENUMERATED.

Manufactured.....	1,408,278
Other articles.....	769,557
Total.....	2,177,835

Sum total value of domestic exports.....\$133,666,955

PUBLICATIONS.

Published on 1st Jan., 1850.

PART I, MEDIUM FOLIO OF SPECIMENS OF THE STONE, IRON, AND WOOD BRIDGES, VIADUCTS, TUNNELS, CULVERTS, &c., of the United States Railroads, Illustrated by a Series of Drawings, from actual measurement of the works, including Plans, Elevations, Sections and details of each Structure, accompanied by remarks on the relative merits of the various forms of construction adopted, as regards economy, strength and durability, with Specifications, Estimates, Bills of Timber, Iron, etc., of the several structures; and an APPENDIX, illustrative of the art of Bridge Building as at present practised in Europe; and numerous original Designs for Bridges, Viaducts, Culverts, etc.; the whole calculated to meet the exigencies of Engineers, and assist Draftsmen, Bridge Builders, Mechanics and Students.

BY GEORGE DUGGAN,
ARCHITECT AND CIVIL ENGINEER.

New York: D. Appleton & Co.; John Wiley; Geo. P. Putnam; and Stringer & Townsend. Boston: Charles C. Little and James Brown. Albany: Little & Co. Philadelphia: George S. Appleton; Grigg, Elliott & Co., and Thomas Cowperthwait. Buffalo: G. H. Derby & Co. Baltimore: Cushing & Brother. Washington: Frank Taylor. Charleston: McCarter & Allen. Cincinnati: H. W. Derby & Co., and Bradley & Anthony. Richmond: A. Morris. Nashville: W. T. Berry & Co. New Orleans: T. L. White and David Felt & Co. St. Louis: J. Halsall. Natchez: W. H. Fox.

ADDRESS.

The want of a work such as the present is designed to be, has long been felt and regretted by the Engineering profession generally, but more especially by those engaged in Railroad constructions; where the number and variety of bridges are such as to make the mode of construction adopted of especial importance to all parties interested in such undertakings whether the mechanical skill, durability, or economy of these structures is considered. As regards the present undertaking, no pains or expense shall be spared to render it complete and efficient to the fullest extent for the various purposes of the Engineer, practical Bridge Builder, and Mechanical Student.

As an extensive circulation alone can meet the heavy expenses incurred in getting up this work, it is hoped that the members of the Engineering profession generally—for whose advantage it is especially designed—will extend to it the encouragement and support so necessary to its access and completion, in a manner that shall reflect credit on the spirit of enterprise, at present so rife in this great country, and also bear testimony to the mechanical skill and ingenuity of our Engineers.

MODE OF PUBLICATION, TERMS, ETC.

This important work will be published monthly, and completed in about Twelve Parts, each part containing Two double or Four single large folio plates, accompanied by appropriate letter press descriptions, Specifications, Estimates of the cost, Bills of Timber, Iron, &c. of each structure, presenting at a glance the comparative merits, as regards economy, strength, and durability of the various modes of Bridge construction at present practised by the most eminent Engineers in the United States.

The Engraving has been entrusted to first rate artists, and is executing in a manner that cannot fail to give satisfaction, while the price (Seventy-five cents a Month) is such as will place it within the reach of all who take an interest in our great mechanical contrivances.

Engineers in charge of Railroad Works, are respectfully requested to send Drawings of their Drawings of Bridges, &c., with the Specifications, Bills of Timber, Iron, &c., to GEORGE DUGGAN Railroad Journal Office 136 Nassau Street New York, with a view to their insertion in this work. The Drawings should not, however, exceed 17 x 10, or 21 x 17 inches.

N. B.—Members of the profession, and others wishing to become subscribers, are requested to send their names without delay to the author, as above, as the publication of the names of Subscribers in one of the early Parts has been determined on, and no more copies of the work will be printed than are found necessary to supply Subscribers.

Cop Waste.

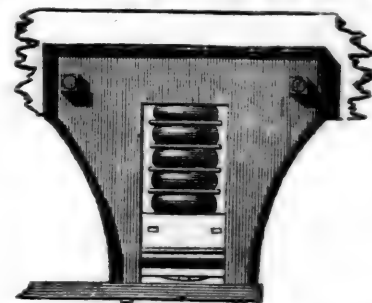
CLEAN COP WASTE, suitable for cleaning Railroad, Steam boat and Stationary Engines, constantly on hand and for sale by

KENNEDY & GELSTON,
54 Pine St., New York.

October 27, 1849,

3m

FULLER'S PATENT INDIA RUBBER SPRING.



THESE SPRINGS ARE THE CHEAPEST, the lightest and most durable of any yet known. They are easily applied to new or old cars, and there is small possibility of any accident occurring to them.

Other parties through Mr. Ray set up claims to an India Rubber Spring which, though the same in principle, is very inferior in its working and durability. Actions are in progress for an Infringement on Fuller's Patent against parties using that Spring.

The superiority of Fuller's Spring over that claimed by Mr. Ray is fully established and has frequently been testified to. The following are from gentlemen who have had much experience with both Springs.

"It will afford me pleasure to recommend your springs to the companies in this region, in preference to Ray's which I am confident are inferior in mechanical arrangement to yours." JOHN M'RAE, Engineer S. Carolina R. R., Charleston.

"I do not hesitate to allow you to say that I concur in Mr. M' Rae's opinion that Ray's springs are inferior in mechanical arrangement to Fuller's. I repeatedly expressed that opinion long before Mr. M' Rae had seen your springs (as I believe) and entertain it still." WM. PARKER, Gen'l Supt. of Baltimore and Ohio R. R.

Office of Sup't Norwich & Worcester R.R. Co.,
December 26, 1849.

"I most fully concur in the opinion of Jno. McRae, Engineer of S. Carolina Railroad, that 'Rays Springs are inferior to Fuller's Springs'; and shall with pleasure recommend them to all Railroad Companies for adoption. I have used both springs on this road and have no hesitation in saying that I should in all cases prefer Fuller's Spring."

SAM'L H. P. LEE, JR.,
Sup't and Engineer.

Office B. & P. R. R. Co.,
Boston, 20th December, 1849.

"This company have cars fitted up with both Ray's and Fuller's 'Metallic India Rubber Springs,' and I do not hesitate to say that Fuller's arrangement is very much superior to Ray's."

W. RAYMOND LEE, Supt.

The following result has been obtained by experiment upon one railroad.

A set of Trucks fitted with Steel Springs cost \$190.77 and weigh 2355 lbs. The same with Fuller's Springs, 131.71 " 1911 lbs.

Difference, \$59.06 " 444 lbs.

Not only is there an advantage in the cost, but owing to the great reduction in weight, the car can be made lighter throughout, and so an enormous saving in weight may be effected in a Train.

G. M. KNEVITT, 38 Broadway, N. Y.,
General Agent for the U. S.

The Springs can also be had of JAMES LEE & CO., 18 India Wharf, Boston, & JAS. THORNLEY, 110 Chestnut St., Philad. January 2, 1850.

Wanted,

A Second Hand Locomotive, weighing from 10 to 12 tons. It is required that in answer, it will be stated, whether the engine has inside or outside connections—the price of the same delivered at Portland, Maine, and terms of payment expected. Address: VIRGIL D. PANIS, President Buckfield Branch Railroad, Portland, Maine.

November 10, 1849.

3c45

The New York Iron Bridge Co.

LATELY KNOWN AS

Rider's Patent Iron Bridge Co.

THE Company which has hitherto furnished these Bridges, under the patent granted to the late Nathaniel Rider, deceased, have become satisfied that all the principles embraced in their construction, are included in a previous patent, granted in the year 1839, to Col. Stephen H. Long, of U. S. Engineers, and by him designated as "Long's Suspension Bridges," and have therefore made an arrangement with Col. Long, by which they have secured the exclusive right to make and vend these Bridges throughout the whole United States.

The only change consequent upon the new arrangement will be found in the name and style of the Company. The parties composing it being the same, the construction of the Bridges will be essentially the same. August 4th, 1849. M. M. White, Agent, au7uf No. 74 Broadway, New York.

To Contractors.

BLUE RIDGE TUNNEL.—The Contractor for the BLUE RIDGE TUNNEL, having failed to come forward and comply with his engagements, notice is hereby given that PROPOSALS will again be received at the Office of the Board of Public Works, until the 21st of January, 1850, for the construction of the Tunnel and approaches.

The Tunnel will be 4260 feet long, 21 feet high and 16 feet wide, with a ditch on each side; it will pass 700 feet under the top of the Mountain and decline from West to East at the rate of 70 feet to the mile. The approaches will be in the aggregate about 2000 feet long, and consist of deep cuts, high embankments, some walling and bridging.

Proposers who have not already examined the localities will do well to call at the office of the Engineer, on the spot, where they will obtain all necessary information.

The payments will be CASH, with a reservation of 20 per cent till the entire completion of the work; besides which, the contractor is required by law to give bond, with satisfactory bond and security in Virginia. The amount of the bond required will be thirty thousand dollars.

The best testimonials and an energetic prosecution of the work are expected: the contract and bond to be executed within ten days after the letting, and the work to begin *bona fide* within sixty days after the same period.

C. CROZET.

Engineer Blue Ridge Railroad.

Terms of proposals and specifications may be obtained at both offices.

NOTICE TO**Superintendents of Railroads.**

TYLER'S PATENT SAFETY SWITCH.—The undersigned would respectfully call their attention to his Patent Safety Switch, which from long trial and late severe tests has proved itself perfectly reliable for the purpose for which it was intended. It is designed to prevent the train from running off when the switch is set to the wrong track by design or accident. The single rail or gate switch is established as the best and safest switch for the ordinary purpose of shifting cars from one track to another, but it is liable to the serious evil of having one track open or broken when connected with the other. My improvement entirely removes this evil, and while it accomplishes this important office, leaves the switch in its original simplicity and perfection of a plain unbroken rail, connecting one track with the other ready for use.

The following decision of the Commissioner of Patents is respectfully submitted to Railroad Engineers, Superintendents, and all others interested in the subject.

(COPY.)

UNITED STATES PATENT OFFICE, }
Washington City, D.C., April 28th, 1846. }

Sir: You are hereby informed that in the case of the interference between your claims and those of Gustavus A. Nicolla, for improvements in safety switches—upon which a hearing was appointed to take place on the 3d Monday in March, 1846, the question of priority of invention has been decided in your favor. Inclosed is a copy of the decision. The testimony in the case is now open to the inspection of those concerned.

Yours respectfully,

EDMUND BURKE,
Commissioner of Patents.

To Philas B. Tyler.

Any further information may be obtained by addressing P. B. TYLER, Springfield, Mass., or JOHN PENDLETON, Agent, 149 Hudson St., New York. 34uf

To Railroad Companies and Contractors.

FOR SALE.—Two Locomotive Engines and Tenders, at present in use on the Beaver Meadow Railroad, being too light for their coal trains, but well calculated for either gravel or light passenger trains.

They weigh, in running order, about 8 tons each—having one pair of driving wheels 4 feet diameter, 4 truck wheels 30 inches diameter, with cylinders 10 in. diameter, and 18 inches stroke of piston. Tenders on 4 wheels. Address JAMES ROWLAND,

Pres't. Beaver Meadow Railroad & Coal Co.,
Philadelphia.or, L. CHAMBERLAIN, Sec'y,
at Beaver Meadow, Pa.

May 19, 1849.

20tf

ENGINEERS.**Arrowsmith, A. T.,**

Buckfield Branch Railroad, Buckfield, Me.

Banks, C. W.,

Civil Engineer, Vicksburg, Miss.

Berrien, John M.,

Michigan Central Railroad, Marshall, Mich.

Buckland, George,

Troy and Greenbush Railroad.

Clement, Wm. H.,

Little Miami Railroad, Cincinnati, Ohio.

Cozzens, W. H.,

Engineer and Surveyor, St. Louis, Mo.

Davidson, M. O.,

Eckhart Mines, Alleghany Co., Maryland.

Fisk, Charles B.,

Cumberland and Ohio Canal, Washington, D. C.

Felton, S. M.,

Fitchburgh Railroad, Boston, Mass.

Floyd-Jones, Charles,

South Oyster Bay, L. I.

Gzowski, Mr.,

St. Lawrence & Atlantic Railroad, Montreal, Canada.

Gilbert, Wm. B.,

Rutland and Burlington Railroad, Rutland, Vt.

Grant, James H.,

Nashville and Chattanooga R. R., Nashville, Tenn.

Harry, P.,

Binghamton, New York.

Holcomb, F. P.

Southwestern Railroad, Macon, Ga.

Higgins, B.

Mansfield and Sandusky Railroad, Sandusky City, O.

Johnson, Edwin F.

New York and Boston Railroad, Middletown Ct.

Latrobe, B. H.,

Baltimore and Ohio Railroad, Baltimore, Md.

Sours, Peter,

Dauphin und Susquehanna Coal Co., Dauphin, Pa.

Miller, J. F.,

Worcester and Nashua Railroad, Worcester, Mass.

Morris, Elwood,

Schuylkill Navigation, Schuylkill Haven, Pa.

Morton, A. C.,

Atlantic and St. Lawrence Railroad, Portland, Me.

McRae, John,

South Carolina Railroad, Charleston, S. C.

Nott, Samuel,

Lawrence and Manchester Railroad, Boston.

Prichard, M. B.,

East Tennessee and Georgia R. R., Cleveland, Tenn.

Reynolds, L. O.,

Central Railroad, Savannah, Ga.

Roebbling, John A.,

Trenton, N. J.

Roberts, Solomon W.,

Ohio and Pennsylvania Railroad, Pittsburgh, Pa.

Robinson, James P.,

Androscoggin & Kennebec Railroad, Waterville, Me.

Schlatter, Charles L.,

Northern Railroad (Ogdensburg), Malone, N. Y.

Stark, George.,

Bost., Con. and Mont. R. R., Meredith Bridge, N. H.

Steele, J. Dutton,

Pottstown, Pa.

Trimble, Isaac R.,

Philad., Wil. & Baltimore Railroad, Wilmington, Del.

Tinkham, A. W.,

United States Fort, Bucksport, Me.

Thomson, J. Edgar.,

Pennsylvania (Central) Railroad, Philadelphia.

Whipple, S.,

Civil Engineer and Bridge Builder, Utica, N. Y.

Williams, E. P.,

Auburn and Schenectady Railroad, Auburn, N. Y.

Williams, Charles H.,

Milwaukee, Wisconsin.

Wormeley, Preble,

Central Ohio Railroad, Zanesville, Ohio.

BUSINESS CARDS.**Cumberland, (Md.) Coals for Steaming, etc.**ORDERS RECEIVED FOR AND FILLED
by J. COWLES, 37 Wall St., N. Y.**George O. Robertson,**

Broker in Scotch and American Pig Iron; Bar Iron,

Lead, Spelter, Tin, Copper, etc.,

NO. 4 LIBERTY PLACE, MAIDEN LANE,

(Near Broadway.)

NEW YORK

DUNLAP'S HOTEL,

On the European Plan,

NO. 135 FULTON STREET,

Between Broadway and Nassau St.,

NEW YORK.

Manufacture of Patent Wire ROPE AND CABLES,

For Inclined Planes, Suspension Bridges, Standing

Rigging, Mines, Cranes, Derrick, Tilters, &c., by

JOHN A. ROEBLING, Civil Engineer,

TRENTON, N. J.

Samuel D. Willmott,

MERCHANT, AND MANUFACTURER OF

CAST STEEL WARRANTED SAWS,

IMPORTER OF THE

GENUINE WICKESLEY GRINDSTONES,

NO. 8 LIBERTY STREET,

NEW YORK.

Doremus & Harris,

ANALYTICAL & CONSULTING CHEMISTS.

179 BROADWAY, NEW YORK.

SCHOOL OF CHEMISTRY.

Dudley B. Fuller & Co.,

IRON COMMISSION MERCHANTS,

No. 139 GREENWICH STREET.

NEW YORK.

Manning & Lee,

GENERAL COMMISSION MERCHANTS,

NO. 51 EXCHANGE PLACE,

BALTIMORE.

Agents for Avalon Railroad Iron and Nail Works,
Maryland Mining Company's Cumberland Coal 'CED'
—'Potomac' and other good brands of Pig Iron.

**Railroad Car Manufacturer's
Furnishing Store.**
F. S. & S. A. MARTINE,
IMPORTERS AND MANUFACTURERS OF
**RAILROAD CAR &
CARRIAGE LININGS,**
PLUSHES, CURTAIN MATERIALS, ETC.,
113 WILLIAM ST., NEAR JOHN.

3-4 and 6-4 Damasks, Union and Worsted; Moireens, Rattinetta, Cloths, Silk and Cotton Velvets, English Bunting

Walter R. Johnson,
CIVIL AND MINING ENGINEER AND ATTORNEY for Patents. Office and Laboratory, F St., opposite the Patent office, Washington, D. C.

S. W. Hill,
Mining Engineer and Surveyor, Eagle River, Lake Superior.

Starks & Pruyn,
MANUFACTURERS OF ALL KINDS OF
STEAM BOILERS,
52 and 54 Liberty, corner of Pruyn street
Nathan Starks, **ALBANY** Special Partner
Wm. F. Pruyn, R. H. Pruyn.
Iron Railing, Bank and Vault Doors, Iron Shutters
Bridge and Roof Bolts, Heavy Jobbing and Forging
of all kinds.
For particulars see Adv. in another column.

To Engineers and Surveyors.
E. BROWN AND SON Mathematical inst. makers No. 27 Fulton Slip, New York, make and keep for sale, Theodolites, Levelling inst., Levelling rods, Surveyors Compasses, and Chains, Cases of Mathematical drawing insts. various qualities, together with a general assortment of Ivory Scales and small insts. generally used by Engineers.

Samuel Kimber & Co.,
COMMISSION MERCHANTS
WILLOW ST. WHARVES, PHILADELPHIA.
AGENTS for the sale of Charcoal and Anthracite
A Pig Iron, Hammered Railroad Car and Locomotive Axles, Force Pumps of the most approved construction for Railroad Water Stations and Hydraulic Rams, etc., etc.
July, 27, 1849.

James Herron, Civil Engineer,
OF THE UNITED STATES NAVY YARD,
PENSACOLA, FLORIDA.,
PATENTEE OF THE
HERRON RAILWAY TRACK.
Models of this Track, on the most improved plans, may be seen at the Engineer's office of the New York and Erie Railroad.

To Railroad Companies.
—WROUGHT IRON WHEELS—
SAFETY AND ECONOMY.
NORRIS' LOCOMOTIVE WORKS,
SCHENECTADY, NEW YORK,
Are Manufacturing Wrought Iron Driving, Truck, Tender, and Car Wheels—made from the best American Iron. Address **E. S. NORRIS.**
May 16, 1849.

Machinery Warehouse.
S. C. HILLS, No. 43 Fulton street, New York, has constantly for sale Steam Engines, Boilers, Lathes, Chucks, Drills, Planers, Force and Suction Pumps; Tenoning, Mortising and Boring Machines, Shingle Machines, Bolt and Nut Machines, Belting, Oil, Iron and Lead Pipe; Rubber, Percha and Leather Hose, &c., &c.
S. C. H.'s arrangements with several machine shops are such that he can supply, at very short notice, large quantities of machinery.
November 23, 1849.

Cruse & Burke,
Civil Engineers, Architects and Surveyors,
Office, New York State Institution of Civil Engineers,
STATE HALL, ALBANY., N. Y.
Drawings, specifications and surveys accurately executed. Pupils instructed theoretically and practically at a moderate premium.
May 26, 1849.

Eaton, Gilbert & Co.,
Railroad Car, Coach and Omnibus Builders,
TROY, N. Y.

Hudson River Foundry,
THOMAS & COLLINS,
130 Quay Street, Albany.

To Railroad & Navigation Cos.
Mr. M. BUTT HEWSON, Civil Engineer, offers his services to Companies about to carry out the surveys or works of a line of Navigation or Railroad. He can give satisfactory references in New York City as to his professional qualifications; and will therefore merely refer here to the fact of his having been engaged for upwards of two years conducting important Public Works for the British Government.
Communications will find Mr. Hewson at the office of the Railroad Journal, 54 Wall Street, New York.

Alfred W. Craven,
Chief Engineer Croton Aqueduct, New York.

IRON.

Iron.
Pig Iron, Anthracite and Charcoal; Boiler and Flue Iron, Spring and Blistered Steel, Nail Rods, Best Refined Bar Iron, Railroad Iron, Car Axles, Nails, Stove Castings, Cast Iron Pipes of all sizes, Railway Chairs of approved patterns for sale by
COLEMAN, KELTON & CAMPBELL,
109 N. Water St., Philadelphia.

IRONDALE PIG METAL, MANUFACTURED
for sale by the Bloomsburg Railroad Iron Co.
DUDLEY FISHER, Treasurer.
76 N. Water St., Philadelphia.

Railroad Iron.
500 Tons, afloat, weighing 57 pounds per lineal yard, for sale by
COLLINS, VOSE & CO.,
153 South St.
New York, November 17, 1849. 1m46

Railroad Iron.
THE Undersigned, Agents for Manufacturers, are prepared to contract to deliver Rails of superior quality, and of any size or pattern, to any ports of discharge in the United States.
COLLINS, VOSE & CO.,
153 South St.
New York, November 17, 1849.

Railroad Iron.
1600 Tons, weighing 60½ lbs. per yard.
185 " " 57½ "
580 " " 53 "
of the latest and most approved patterns. For sale by
BOORMAN, JOHNSTON & CO.,
119 Greenwich street.
New York, Oct. 13, 1849.

Railroad Iron.
THE Undersigned have on hand, ready for immediate delivery, various patterns of Iron Rails, of best English make, and manufactured in conformity with special specifications.
They offer also to import and contract to deliver ahead—on favorable terms.
DAVIS, BROOKS, & CO.,
63 Broad street.
New York, Oct. 11, 1849.

Drawings and Patterns of the most approved Rail—and specifications of quality and make of same, are on hand at their office, for examination of parties who may desire to inspect the same. D., B. & Co.
Oct. 11, 1849.

CUT NAILS OF BEST QUALITY, BAR IRON
(including Flat Rails) manufactured and for sale by
FISHER, MORGAN & CO.,
75 N. Water St., Philadelphia.

Railroad Iron.
THE Undersigned offer for sale 3000 Tons Railroad Iron at a fixed price, to be made of any required ordinary section, and of approved stamp.
They are generally prepared to contract for the delivery of Railroad Iron, Pig, Bar and Sheet Iron—or to take orders for the same—all of favorite brands, and on the usual terms.
ILLIUS & MAKIN.
41 Broad street.
March 29 1849. 3m.13

Glendon Refined Iron.

Round Iron, Band Iron, Hoop Iron,
Square " Flat " Scroll "

Axles, Locomotive Tyres,
Manufactured at the Glendon Mills, East Boston, for sale by
GEORGE GARDNER & CO.,
5 Liberty Square, Boston, Mass.
Sept. 15, 1849. 3m37

PATENT HAMMERED RAILROAD, SHIP & BOAT SPIKES.—The Albany Iron Works have always on hand, of their own manufacture, a large assortment of Railroad, Ship and Boat Spikes from 2 to 12 inches in length, and of any form of head. From the excellence of the material always used in their manufacture, and their very general use for railroads and other purposes in this country, the manufacturers have no hesitation in warranting them fully equal to the best spikes in market, both as to quality and appearance. All orders addressed to the subscribers at the works will be promptly executed.

JOHN F. WINSLOW, Agent.
Albany Iron and Nail Works, Troy, N. Y.
The above Spikes may be had at the following prices, of Erastus Corning & Co Albany; Merritt & Co. New York; E. Pratt & B. Co. Es. 2m. Md

LAP—WELDED WROUGHT IRON TUBES

TUBULAR BOILERS,
FROM 1 1-2 TO 8 INCHES DIAMETER.
These are the ONLY Tubes of the same quality and manufacture as those so extensively used in England, Scotland, France and Germany, for Locomotive, Marine and other Steam Engine Boilers
THOMAS PROSSER,
Patentee.
38 Platt street, New York

Railroad Iron.
THE UNDERSIGNED ARE PREPARED TO contract for the delivery of English Railroad Iron of favorite brands, during the Spring. They also receive orders for the importation of Pig, Bar, Sheet, etc. Iron.
THOMAS B. SANDS & CO.,
22 South William street,
New York.
February 3, 1849.

Iron Store.
THE Subscribers, having the selling agency of the following named Rolling Mills, viz: Norristown, Rough and Ready, Kensington, Triadelphia, Pottsgrove and Thorndale, can supply Railroad Companies, Merchants and others, at the wholesale mill prices for bars of all sizes, sheets cut to order as large as 58 in. diameter; Railroad Iron, domestic and foreign; Locomotive tire welded to given size; Chairs and Spikes; Iron for shafting, locomotive and general machinery purposes; Cast, Shear, Blister and Spring Steel; Boiler rivets; Copper; Pig iron, etc., etc.
MORRIS, JONES & CO.,
Iron Merchants,
Schuylkill 7th and Market Sts., Philadelphia.
August 16, 1849. 1y33

Railroad Iron.
THE MOUNT SAVAGE IRON WORKS, Alleghany county, Maryland, having recently passed into the hands of new proprietors, are now prepared, with increased facilities, to execute orders for any of the various patterns of Railroad Iron. Communications addressed to either of the subscribers will have prompt attention. **J. F. WINSLOW, President**
Troy, N. Y.

ERASTUS CORNING, Albany.
WARREN DELANO, Jr., N. Y.
JOHN M. FORBES, Boston.
ENOCH PRATT, Baltimore, Md.
November 6, 1849.

Railroad Iron.
THE SUBSCRIBERS ARE PREPARED TO take orders for Railroad Iron to be made at their Phoenix Iron Works, situated on the Schuylkill River, near this city, and at their Safe Harbor Iron Works, situated in Lancaster County, on the Susquehanna river; which two establishments are now turning out upwards of 1800 tons of finished rails per month.
Companies desirous of contracting will be promptly supplied with rails of any required pattern, and of the very best quality.
REEVES, BUCK & CO.,
45 North Water St., Philadelphia.
March 15, 1849.

Monument Foundry.

A. & W. DENMEAD & SON,
Corner of North and Monument Sts.,—Baltimore,
HAVING THEIR

IRON FOUNDRY AND MACHINE SHOP

In complete operation, are prepared to execute faithfully and promptly, orders for Locomotive or Stationary Steam Engines, Woolen, Cotton, Flour, Rice, Sugar Grist, or Saw Mills,

Slide, Hand or Chuck Lathes, Machinery for cutting all kinds of Gearing. Hydraulic, Tobacco and other Presses, Car and Locomotive patent Ring Wheels, warranted,

Bridge and Mill Castings of every description, Gas and Water Pipes of all sizes, warranted, Railroad Wheels with best fagotted axle, furnished and fitted up for use, complete

Being provided with Heavy Lathes for Boring and Turning Screws, Cylinders, etc., we can furnish them of any pitch, length or pattern.

Old Machinery Renewed or Repaired—and Estimates for Work in any part of the United States furnished at short notice.

June 8, 1849.

Iron Wire.

REFINED IRON WIRE OF ALL KINDS, Card, Reed, Cotton-flyer, Annealed, Broom, Buckle, and Spring Wire. Also all kinds of Round, Flat or Oval Wire, best adapted to various machine purposes, annealed and tempered, straightened and cut any length, manufactured and sold by

ICHABOD WASHBURN.

Worcester, Mass., May 25, 1849.

American and Foreign Iron.**FOR SALE,**

300 Tons A 1, Iron Dale Foundry Iron.

100 "	1,	"	"	"
100 "	2,	"	"	"
100 "	"	"	Forge	"
400 "	"	Wilkesbarre	"	"
100 "	"	"Roaring Run"	Foundry Iron.	"
300 "	"	Fort	"	"
50 "	"	Catoctin	"	"
250 "	"	Chikiswalungo	"	"
50 "	"	"Columbia"	"chilling" iron, a very superior article for car wheels.	"
75 "	"	"Columbia"	refined boiler blooms.	"
30 "	"	1 x 1/2	Slit iron.	"
50 "	"	Best Penna.	boiler iron.	"
50 "	"	"Puddled"	"	"
50 "	"	Bagnall & Sons	refined bar iron.	"
50 "	"	Common bar	iron.	"

Locomotive and other boiler iron furnished to order.

GOODHUE & CO.,
64 South street

American Pig, Bloom and Boiler Iron.

HENRY THOMPSON & SON,
No 57 South Gay St., Baltimore, Md.
Offer for sale, *Hot Blast* Charcoal Pig Iron made at the *Catoctin* (Maryland), and *Taylor* (Virginia), *Furnaces*; *Cold Blast* Charcoal Pig Iron from the *Cloverdale* and *Catawba*, Va., *Furnaces*, suitable for *Wheels* or *Machinery* requiring extra strength; also *Boiler* and *Flue* Iron from the mills of *Edge & Hilles* in Delaware, and best quality *Boiler Blooms* made from *Cold Blast* Pig Iron at the *Shenandoah Works*, Va. The productions of the above establishments can always be had at the lowest market prices for approved paper.

American Pig Iron of other brands, and *Rolled* and *Hammered Bar Iron* furnished at lowest prices. Agents for *Watson's Perth Amboy Fire Bricks*, and *Rich & Cos.* New York Salamander Iron Chests.
Baltimore, June 14, 1849. 6 mos

LAP-WELDED WROUGHT IRON TUBES for Tubular Boilers, from 1 1/2 to 15 inches diameter, and any length not exceeding 17 feet—manufactured by the Caledonian Tube Company, Glasgow, and for sale by

IRVING VAN WART,
12 Platt street, New York.

JOB CUTLER, Patentee.

These Tubes are extensively used by the British Government, and by the principal Engineers and Steam Marine and Railway Companies in the Kingdom.

Railroad Iron.

THE TRENTON IRON COMPANY ARE NOW turning out one thousand tons of rails per month, at their works at Trenton, N. J. They are prepared to enter into contract to furnish rails of any pattern, and of the very best quality, made exclusively from the famous Andover iron. The position of the works on the Delaware river, the Delaware and Raritan canal, and the Camden and Amboy railroad, enables them to ship rails at all seasons of the year. Apply to

COOPER & HEWITT, Agents.
October 30, 1848. 17 Burling Slip, New York.

Pig and Bloom Iron.

THE Subscribers are Agents for the sale of numerous brands of Charcoal and Anthracite Pig Iron, suitable for Machinery, Railroad Wheels, Chains, Hollowware, etc. Also several brands of the best Puddling Iron, Juniata Blooms suitable for Wiro, Boiler Plate, Axe Iron, Shovels, etc. The attention of those engaged in the manufacture of Iron is solicited by

A. WRIGHT & NEPHEW,
Vine Street Wharf, Philadelphia.

Iron.

THE SUBSCRIBERS having resumed the agency of the New-Jersey Iron Company, are prepared to execute orders for the different kinds and sizes of Iron usually made at the works of the company, and offer for sale on advantageous terms.—

150 tons No. 1 Boonton Foundry Pig Iron.

100 "	No. 2	do.	do.
300 "	Nos. 2 & 3	Forge	do.
100 "	No. 2	Glendon	do.
140 "	Nos. 2 & 3	Lehigh Crane	do.
100 "	No. 1	Pompton Charcoal	do.
100 "	New-Jersey	Blooms	
50 "	New-Jersey	Fagotted Iron,	for shafts
	Best Bars,	1/2 to 4 inch by 1/2 to 1 inch thick.	
	Do do	Rounds and Squares,	1/2 to 3 inch.
		Rounds and Squares,	3-16 to 1 inch.
		Half Rounds,	1/2 to 1 in. Ovals & Half Ovals 1/2 to 1 1/2 in.
		Bands,	1/2 to 4 inch. Hoops, 1/2 to 2 inch.
		Trunk Hoops,	1/2 to 1 1/2 in. Horse Shoe & Nut Iron.
		Nail Plates,	Railroad Spikes.

DUDLEY E. FULLER & Co., 139 Greenwich-st. and 85 Broad-st.

WILLIAM JESSOP & SONS' CELEBRATED CAST-STEEL.

The subscribers have on hand, and are constantly receiving from their manufactory.

PARK WORKS, SHEFFIELD,

Double Refined Cast Steel—square, flat and octagon. Best warranted Cast Steel—square, flat and octagon. Best double and single Shear Steel—warranted. Machinery Steel—round.

Best and 2d gy. Sheet Steel—for saws and other purposes. German Steel—flat and square, "W. I. & S." "Eagle" and "Goat" stamps.

Genuine "Sykes," L Blister Steel. Best English Blister Steel, etc., etc., etc.

All of which are offered for sale on the most favorable terms by **WM. JESSOP & SONS,** 91 John street, New York.

Also by their Agents—

Curtis & Hand, 47 Commerce street, Philadelphia. Alex'r Fullerton & Co., 119 Milk street, Boston. Stickney & Beatty, South Charles street, Baltimore.

May 6, 1849.

SPRING STEEL FOR LOCOMOTIVES, TENDERS AND CARS.

The subscriber is engaged in manufacturing spring steel from 1 1/2 to 6 inches in width, and of any thickness required: large quantities are yearly furnished for railroad purposes, and wherever used its quality has been approved of. The establishment being large, can execute orders with great promptitude, at reasonable prices, and the quality warranted. Address **J. F. WINSLOW, Agent,** Albany Iron and Nail Works.

JOHNSON, CAMMELL & Co's Celebrated Cast Steel,

AND
ENGINEERING AND MACHINE FILES, which for quality and adaptation to mechanical uses, have been proved superior to any in the United States. Every description of square, octagon, flat and round cast steel, sheet, shovel and railway spring steel, best double and single shear steel, German steel, flat and square, goat stamps, etc. Saw and file steel, and steel to order for any purposes, manufactured at their Cyclops Steel Works Sheffield.

JOHNSON, CAMMELL & CO.,
100 William St., New York.

November 23 1842.

American Cast Steel.

THE ADIRONDAC STEEL MANUFACTURING CO. is now producing, from American iron, at their works at Jersey City, N. J., Cast Steel of extraordinary quality, and is prepared to supply orders for the same at prices below that of the imported article of like quality. Consumers will find it to their interest to give this a trial. Orders for all sizes of hammered cast steel, directed as above, will meet with prompt attention.

May 28, 1849.

To Steam Engine Builders.

THE Undersigned offer for sale, at less than half its cost, the following new machinery, calculated for an engine of 62 inches cylinder and 10 feet stroke, viz:

- 2 Wrought Iron Cranks, 60 inches from centre to centre.
- 1 Do. do. Connecting Rod Strap.
- 2 Do. do. Crank Pins.
- 1 Eccentric Strap.
- 1 Diagonal Link with Brasses.
- 1 Cast Iron Lever Beam (forked).

The above machinery was made at the West Point Foundry for the U. S. Steamer Missouri, without regard to expense, is all finished complete for putting together, and has never been used. Drawings of the cranks can be seen on application to

HENRY THOMPSON & SON,
No. 57 South Gay St., Baltimore, Md.

Sept. 12, 1849.

Railroad Instruments.

THEODOLITES, TRANSIT COMPASSES, and Levels, with Fraunhoffer's Munich Glasses, Surveyor's Compasses, Chains, Drawing Instruments, Barometers, etc., all of the best quality and workmanship, for sale at unusually low prices, by

E. & G. W. BLUNT,
No. 179 Water St., cor. Burling Slip.

New York, May 19, 1849.

Mattewan Machine Works.

THE Mattewan Company have added to their Machine Works an extensive LOCOMOTIVE ENGINE department, and are prepared to execute orders for Locomotive Engines of every size and pattern—also *Tenders, Wheels, Axles,* and other railroad machinery, to which they ask the attention of those who wish such articles, before they purchase elsewhere.

STATIONARY ENGINES, BOILERS, ETC., Of any required size or pattern, arranged for driving *Cotton, Woolen, or other Mills,* can be had on favorable terms, and at short notice.

COTTON AND WOOLLEN MACHINERY, Of every description, embodying all the modern improvements, second in quality to none in this or any other country, made to order.

MILL GEARING,

Of every description, may be had at short notice, as this company has probably the most extensive assortment of patterns in this line, in any section of the country, and are constantly adding to them.

TOOLS.

Turning Lathes, Slabbing, Planing, Cutting and Drilling Machines, of the most approved patterns, together with all other tools required in machine shops, may be had at the Mattewan Company's Shops, Fish-kill Landing, or at 39 Pine street, New York.

WM. B. LEONARD, Agent.

NOTICE.

TO BRIDGE BUILDERS, BRIDGE COMPANIES, and Other Individuals and Associations, who have constructed or used Bridges involving the combined principle of *Bracing, Counter-bracing and Trussing* by means of counteracting braces, keys, wedges, screw, etc., as set forth and explained in my Bridge Patent of 1830, in the words following, to wit: "A system of Counter-bracing, by means of which the truss frames are rendered stiff and unyielding, and the bridge kept in uniform action whether loaded or unloaded"—NOTICE is hereby given, that in all cases in which said combined principle has been introduced into bridges, without due license or authority from me, and without my having been duly remunerated therefor, will be regarded as infringements upon my rights and privileges, and that an amicable adjustment and settlement of all my claims in the premises may be effected by prompt application to my duly authorized Agents therefor, viz: Messrs. Clinton, Knight and Brother, of Cincinnati, Ohio, or Daniel A. Webster, Esq., 8 Pell street of the city of New York.

STEPHEN H. LONG, Patentee.

Louisville, December 10, 1849.

To Railroad Companies.

FOR SALE—A Second-hand Locomotive Engine and Tender, of about 10 tons weight, in good order, and warranted to perform well. Any company wanting a cheap engine for a passenger or light burden train, will rarely meet with an opportunity so favorable as the present. The engine and tender are in perfect running order, and will be tested to the satisfaction of any one wishing to purchase. Price \$1,500.

Address **J. B. MOORHEAD,**
Frazer P.O., Chester county, Pa.

P.S.—The Engine can be seen by calling on H. Osmond & Co., Car-builders, Broad st., Philadelphia.
September 6, 1849.

India-rubber for Railroad Cos.

RUBBER SPRINGS—Bearing and Buffer—Fuller's Patent—Hose from 1 to 12 inches diameter. Suction Hose. Steam Packing—from 1-16 to 2 in. thick. Rubber and Gutta Percha Bands. These articles are all warranted to give satisfaction, made under Tyer & Helm's patent, issued January, 1849. No lead used in the composition. Will stand much higher heat than that called "Goodyear's," and is in all respects better than any in use. Proprietors of railroads do not be overcharged by pretenders.

HORACE H. DAY,

Warehouse 23 Courtlandt street.

New York, May 21, 1849.

Fire Brick.

THE Subscribers have constantly on hand Rafford's Stourbridge, Oak Farms Stourbridge, Lister, Wortley, Red and White Welsh Fire Bricks, common and fancy shapes. Also,

ROOFING SLATES,

from the best Welch quarries, and of all sizes. Also,

COAL,

of all kinds—Liverpool Orrell and Cannel, Scotch, New Castle, Pictou, Sidney, Cumberland, Virginia, and all kinds of Anthracite coals. Also,

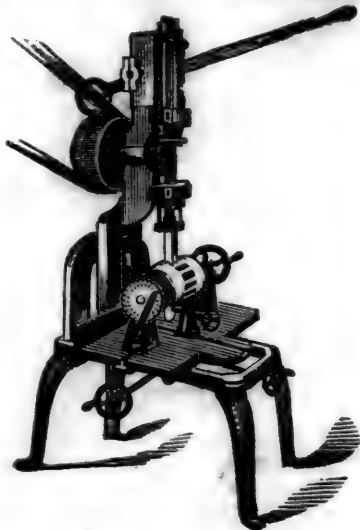
Pig Iron, Salt, etc., etc., for sale at the lowest market price. Apply to

SAMUEL THOMPSON & NEPHEW,

275 Pearl and 43 Gold Sts., New York.

November, 23, 1849.

**Capt. Alfred Swingle's
PATENT BORING
& MORTISING MACHINE.**



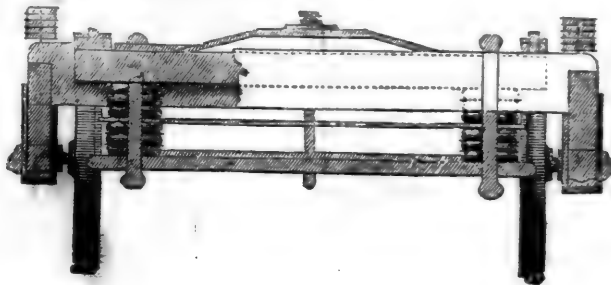
The above Machine was invented by A. SWINGLE, of Texas, in 1846, and Letters Patent were taken out in July, 1848. As a labor saving Machine it stands unrivalled even in these days of improvements. Its uses are innumerable; it may be successfully applied to Doors, Sashes, Carriages, Wheel-Hubs, and in fact to all kinds of work where the Auger and Chisel can be brought to bear.

The only limit to the speed of the working of this machine is the heating of the tools used. It will perform at least the labor of twelve men, and in vastly better manner, and can be worked equally well by steam power or by hand. It has been used and has given universal satisfaction.

For further information apply to **H. B. TENNENT,** 40 Wall St., New York, to whom all orders are to be addressed.

New York, December 15, 1849.

**FULLER'S PATENT
INDIA RUBBER CAR SPRINGS.**



RAILROAD COMPANIES are cautioned, before purchasing Springs, to examine the actual patents and judge for themselves.

Persons, under the Title of the New England Car Company, seeking fraudulently to invade Fuller's rights have put forth so many statements for the purpose of misleading the public, that an enumeration of some facts is absolutely necessary, for the purpose of putting persons interested upon their guard.

Fuller's patent is for the application of Discs of India-rubber with Metal Plates, for forming Springs for Railway Cars and Carriages—either one disc and two plates, or ten discs and plates, or any other number, are equally covered by the patent. Fuller is not bound to the use of short discs—he may use long discs and plates.

Ray's patent is simply and wholly the forming of air tight rubber cylinders, with hoops or bands round the outside, and the combination of elasticity of India rubber, with the elasticity of atmospheric air confined in the cylinder, and in no part of his patent is he authorized to use the form of spring which he is now fraudulently supplying to Railroad Companies. Such springs are direct and positive infringements of the very letter of Fuller's patent.

Fuller's patent is dated October, 1845, Ray's patent, August, 1848.

The spring patented by Ray never has been put in operation, and never can be made useful for Railroad cars.

A mere experiment, even if made, it is well known does not prove an invention; and it is ridiculous for such parties to hope to mislead the Presidents and Superintendents of Railroad companies, by claiming the invention because Ray alleges he made an experiment—which Fuller had made before him—had actually brought into working order, and obtained a patent for—and this too before Mr. Ray states he made his experiment—and that experiment not claimed to have been applied to a car or carriage.

Besides, the invention could not have been developed until India rubber, properly Vulcanised, could be made of a sufficient thickness. In the United States the art of vulcanising rubber by steam heat, (by which

means only can a body of rubber having any considerable thickness be vulcanised,) was not introduced until after the grant by the American government of the patent for springs to Fuller—whereas the process of vulcanising rubber by steam heat was invented in England about three years previously, and was used by Fuller there. This fact refutes entirely the claim of invention put forth by Mr. Ray, and proves the impossibility of his pretensions being true.

Fuller was the first and only inventor of the spring. A Mr. Dorr, whose connection with Mr. Goodyear is well known in this country, applied in England to Mr. Fuller, after he had published and patented his invention, and introduced another party for the purpose of obtaining the agency for the United States. They were furnished with a complete set of drawings and models, and with instructions to make arrangements for the supply of material of American manufacture—from that hour to the present not a single communication has been received from them. Some of these identical models have been traced into the hands of parties now seeking to invade Fuller's rights, and who have exhibited them as specimens of their own invention.

After this, the conveyance was made by Goodyear to certain parties here for the use for railroad springs of what he calls his Metallic rubber. Comment is unnecessary.

There are 5 or 6 different processes for the manufacture of vulcanised rubber, patented by as many different parties, some here, some in England, either of which would probably make good springs.

A large and powerful company has been organised under Fuller's patent, the particulars of which shall be given very shortly.

An action has been commenced against three railroad companies for infringement; and all other parties will assuredly be prosecuted if they continue farther to infringe upon Fuller's patent.

W. C. FULLER,

The only persons authorised to supply the Springs are **G. M. KNEVITT,** 38 Broadway, N. York,

General Agent for the U. S.; and

JAS. LEE & Co., 18 India Wharf, Boston.

JOHN THORNLEY, Chestnut st., Philad.

**To the Proprietors of Rolling
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THE Undersigned—Proprietors of Townsend's Furnace and Machine Shop, Albany—are extensively engaged in the manufacture of Machinery and fixtures for Iron, and Copper Rolling Mills, and Iron Works. Having paid particular attention to the manufacture of *Rolls* (Rollers), both *chilled* and *dry-sand*, they feel confident that they can execute orders for such castings in a satisfactory manner. And to give assurance of this, they beg leave to refer to the following named persons, proprietors and managers of some of the most extensive rolling mills in the country, viz: Jno. F. Winslow, J. Tuckerman, H. Burden, W. Burr, J. & J. Rogers, Saltus & Co., J. B. Bailey, L. G. B. Cannon, Hawkins & Atwater, etc., etc.

F. & T. TOWNSEND,

Albany, August 18, 1849.

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THE Subscriber having been appointed sole Agent for Faber's Magnetic Water Gauge, is now ready to supply the trade, and also individuals with this celebrated instrument. Besides the greatest safety from explosion resulting from its use, it is a thorough check against careless stoking and feeding. In marine engines it will regulate the exact quantity required in the "blow off." Pamphlets containing full information, can be had free on application to the Agent,

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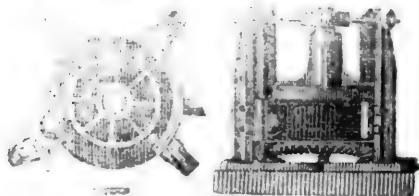
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THE Subscriber having recently purchased the right of this machine for the United States, now offers to make transfers of the right to run said machine, or sell to those who may be desirous to purchase the right for one or more of the States.

This machine is now in successful operation in ten or twelve iron works in and about the vicinity of Pittsburgh, also at Phoenixville and Reading, Pa., Covington Iron Works, Md., Troy Rolling Mills, and Troy Iron and Nail Factory, Troy, N. Y., where it has given universal satisfaction.

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P. A. BURDEN, Agent,
Troy Iron and Nail Factory, Troy, N. Y.

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CHILLED RAILROAD WHEELS.—THE UNDERSIGNED are now prepared to manufacture their Improved Corrugated Car Wheels, or Wheels with any form of spokes or discs, by a new process which prevents all strain on the metal, such as is produced in all other chilled wheels, by the manner of casting and cooling. By this new method of manufacture, the hubs of all kinds of wheels may be made whole—that is, without dividing them into sections—thus rendering the expense of banding unnecessary; and the wheels subjected to this process will be much stronger than those of the same size and weight, when made in the ordinary way.

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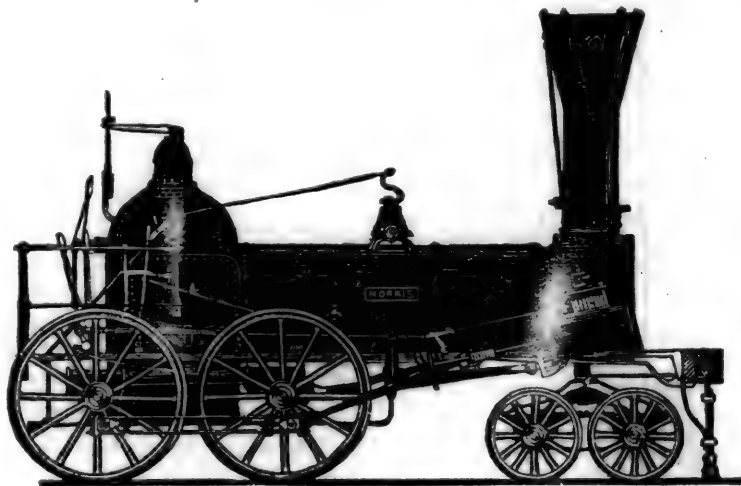
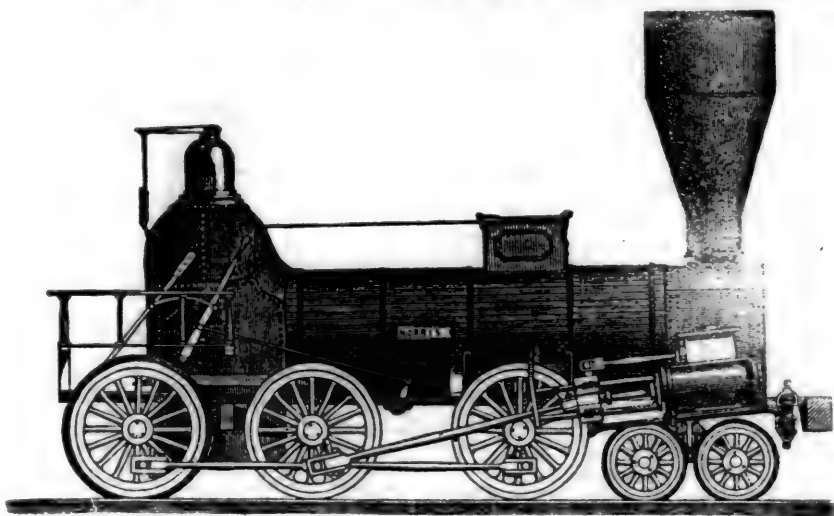
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Kensington, Philadelphia Co., }
March 12, 1848. }

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LAWRENCE'S ROSENDALE HYDRAULIC Cement. This Cement is warranted equal to any manufactured in this country, and has been pronounced superior to Francis' "Roman." Its value for Aqueducts, Locks, Bridges, Floors, and all Masonry exposed to dampness, is well known, as it sets immediately under water, and increases in solidity for years. For sale in lots to suit purchasers, in tight papered barrels, by

JOHN W. LAWRENCE,
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Troy Iron and Nail Factory, Troy, N. Y.

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FOR the use of SCHOOLS and SELF-INSTRUCTION, containing,

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AMERICAN RAILROAD JOURNAL.

STEAM NAVIGATION, COMMERCE, MINING, MANUFACTURES.

HENRY V. POOR, Editor.

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GEN. CHAS. T. JAMES, *For Manufactures and the
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American Railroad Journal.

PUBLISHED BY J. H. SCHULTZ & Co., 136 NASSAU ST.

Saturday, January 19, 1850.

Lead Ores.

Processes for Separating the Silver from Argentiferous Leads.—Though we have not yet had occasion to adopt these processes in this country, it seems reasonable to suppose we shall some time require them, considering the great variety of our mineral resources already known, and the numerous localities, which have afforded more or less argentiferous galena. A short account of them therefore will not be inappropriate in a description of these ores.

The only process in use until within a few years in Germany and in England, is that of *cupellation* based upon the property of lead to suffer oxidation, while silver is unaffected by a current of air playing over the surface of a melted body of these two metals. In Germany a circular furnace is built, its floor about six feet in diameter, and covered with a layer of washed wood ashes carefully rammed; in its centre a cavity is left intended to col-

lect the silver from the charge of silver-lead. On this floor is placed the charge of silver metal, amounting to 84 cwt. The fire place is separated from the body of the furnace by a bridge, as in a reverberatory furnace. It is fed with billets of wood of a resinous nature, that gives a quick flame. At the side of the furnace are placed bellows for blowing a current of air over the surface of the melted metals, the tweres entering just above its level.— Opposite the tweres is an aperture for the exit of the oxide of lead formed in the process.

The heat is gradually raised for about three hours, until the lead is thoroughly melted, when the bellows commence to blow over its surface. In about five hours the fire is still more increased, and the froth of oxidated metals is draw with a rake out of the aperture at the side of the furnace: this operation continues an hour and a half. The litharge or oxide of lead then begins to form, a part sinking into the ash floor and a part floating towards the aperture, out of which it drops in a liquid form.— For twelve hours this operation goes on, the metal on the floor, as it diminishes in quantity constantly growing richer in silver. The fire is then still more increased, and precautions are taken to prevent the escape of silver through the aperture in case of an explosion, or sudden sinking of the silver cake into the ash floor. After about twenty hours the remaining metal suddenly brightens up, the process having reached the “lightning” which attends the disappearance of the last particles of the oxide of lead. Hot water is then introduced upon the cake of silver, and the fire is suffered to go down.

The process requires about twenty hours and a consumption of about 800 feet of resinous wood to 100 cwt. of lead. Larger furnaces and larger charges than 84 cwt. have failed of working successfully.

The litharge taken out of the aperture and that from the ash floor of the furnace is afterwards reduced to a metallic state in another furnace with charcoal; but there is always a loss from the original quantity of the metal of from four to seven per cent.

The English refining furnaces differ from the German in using a much smaller ash floor or cupel, and introducing the lead into it in a melted state in portions as the lead is oxidised and the litharge removed. The cupel is made in a moveable iron frame, which when filled with a mixture of

fern and bone ashes is set in the floor of the furnace. The charge run through in one turn is the same quantity, 84 cwt., as in the German furnaces, and occupies from 16 to 18 hours. The metals are not wholly separated, but about one cwt. of lead is left with the silver until the mass is taken out and submitted to another cupellation on a smaller scale.

Sometimes cupels are used sufficient for the refining of three times the quantity of lead, the litharge then being taken out by different apertures.— By the former method three men can cupel 24 fadders* of lead in a week with a consumption of 3 cwt. of bituminous coal for each fodder. By the latter, when 12 or 13 fadders are passed through one cupel, only one cupel is made per week; but three men can still refine 24 to 26 fadders in this time conducting at the same time two furnaces.

This process is too expensive for ores containing a small amount of silver. It has beside the objection of involving a considerable loss of lead and the trouble of re-converting the litharge to the metallic state, there being no sale for the large quantities made in this operation. It is also highly injurious to the health of the workmen.

A new method was introduced a few years since by Mr. Pattinson of Newcastle, founded on the tendency of lead and silver to separate while slowly cooling from a melting temperature. In this condition the lead tends to form little crystals, which subside in the fluid, as crystals of salt do in an evaporating briny solution. Both may be removed, leaving the remaining portion of it richer in the other substances they contained. A considerable quantity of crystals of lead may be thus removed without risk of taking out any of the silver, but as the mixture becomes richer in the precious metal, a portion of this will be found in the lead crystals.— As the process is conducted the alloy is usually brought to about ten times its original richness in silver, which leaves only one-tenth to be finished by the old process of cupellation, the remaining nine-tenths having been taken out and re-melted into marketable lead without the trouble, loss in lead, and expense of the litharge process.

The silver lead is melted in iron kettles capable of holding each about three tons of lead. Several of these are set in a line, and each has a discharge pipe from the side at the bottom, by which the re-

* A fodder is 21 cwt.

maining portion may be drawn off at will. Each kettle has its own fire, and this is shut off from the first one, as soon as the lead it contains is melted. To keep up a uniform temperature this is constantly stirred with an iron bar; and when the crystals are seen to form, another workman with a long-handled iron drainer, previously heated, fishes them out, and after letting the liquid metal drain from them, throws them into the next kettle. The first workman continues to stir and keep the sides clear of the cooling portions, which collect upon them, while the other takes out the crystals, until only one-fourth part of the whole remains. This occupies about 15 minutes. Half of the remainder is then taken out as it crystallises and thrown upon the ground. The kettle is then re-heated and the rich alloy is run off, when the crystals last taken out are returned to it and fresh lead added to recommence the operation.

While this is melting the same process is carried on in the second kettle. Three quarters of its contents are removed in a crystalline state into the third kettle, one-eighth in crystals which are thrown on the ground, and the remaining eighth back into the first kettle. The third and fourth kettles are treated in the same way, and in the fifth the lead is finally melted to be run off into pigs.

Samples of the product of this process taken from the different stages were analysed at the School of Mines of Paris, and gave the following results.—They were of two different operations one with lead, nearly ten times as rich in silver as the other.

1.

Silver in 1 of lead.	
0. Original lead.....	0.001153
Rich crystals.....	0.003324
2. Poor ".....	0.000933
Rich ".....	0.0020892
3. Poor ".....	0.0007021
Rich ".....	0.001399
Poor ".....	0.0004569
Rich ".....	0.00098135
P. Poor ".....	0.0001128

2.

Silver in 1 of lead.	
0. Original lead.....	0.000224
Rich crystals.....	0.000598
2. Poor ".....	0.000877
Rich ".....	0.0002367
3. Poor ".....	0.000292
Rich ".....	0.0001300
P. Poor ".....	0.0000195

From these tables it is seen, that with the richer lead four crystallizations were necessary to render the last product ten times as rich in silver as the original lead; while with the poorer quality only three crystallizations were required to produce the same result.

Examining, besides, in the 1st table, the proportions between the richness of each poor lead and the lead from which it directly comes, we find these represented by the following numbers, which go on regularly increasing as the alloy becomes poorer in silver, viz: 1.15, 1.32, 1.53, 4.05.

Whence it appears that the process is best adapted to the poorer qualities of silver lead.

An operation conducted upon 25 fodders, 15 cwt., 49 lbs., or 540 cwt. 49 lbs. of metal having 5 ozs. of silver per fodder, gave, after three successive crystallizations, the following products, with the accompanying expenses.

440 cwt. of poor lead containing $\frac{1}{2}$ oz. of silver per fodder.

15 " 49 lbs. of lead having nearly the original richness.

84 cwt. of rich lead for cupelling having 29 ozs. per fodder.

Loss 1 cwt.

The expenses were as follows:

Refining by Crystallization.

274 days' work at 3 shillings each.....	£4 2 6
3 cwt. of coal per fodder of poor lead separated.....	0 12 0
£3 per fodder of poor lead for patent rights.....	3 3 0
Loss—1 cwt. lead (rate of 25 lbs per fodder).....	1 4 0

£9 1 6

Cupellation of the 84 cwt.

Labor.....	£0 14 0
Fuel, 12 cwt. per fodder of lead.....	0 8 8
Cupel.....	0 6 4
Loss in lead, 1-14 of the lead cupelled.....	7 3 0

£8 12 0

This makes the whole expenses by the new process £17 13 6, while by direct cupellation it would have been £54 16 7. According to this estimate, the saving with lead of this richness by the new process over the old is as three to one; but as seen from the analyses of the products of the different qualities of lead operated upon, the expenses must increase with its richness in silver. The cupelling process on the other hand is not liable to this objection, and is moreover applicable to impure qualities of lead, that would be altogether unsuited to the parting by crystallization. Where the leads are rich in silver, and of impure quality, and there is a market for the litharge produced, the old method will be found best adapted for separating the two metals; but where the leads are of pure quality and contain a small quantity of silver, the crystallization will be the most economical process, and will pay even when the alloy contains only about three ounces of silver to the ton.*

SHAWANGUNK MINE—NEW YORK.

This is particularly described by Prof. Mather and Dr. Beck in the State Geological Reports.—The mine is in Sullivan county near the village of Wurtsboro', the smelting works on the Delaware and Hudson canal, and the mine itself not more than a mile distant. It is in a mountain six or seven hundred feet above the Mamakating valley. This mountain is composed of the rock called Shawangunk grit or conglomerate; one of the lower stratified rocks of the New York system. It corresponds to the coarse Sandstone Formation IV of the Pennsylvania and Virginia Reports. Dr. Beck describes the rock at the mine as dipping west south west about 45°. From Prof. Mather's report this appears to be rather the course of the strata, as the only dips he cites, on page 356, are either east south east or west north west. The course of the accompanying section, which is from Prof. Mather's Report, is not given. On the ground plan of the mine and adjoining lands surveyed by John Kitz, the Delaware and Hudson canal is seen to the south-east of the mountain. This appears then to be the direction of the dip. There seems to be some doubt whether the ore deposit is a bed or a vein. Prof. Mather describes it as occurring between the strata, its strike being the same, but the angle of its dip somewhat greater; and he expresses himself fully of the opinion that its coincidence with the stratification is to be regarded as accidental, and that it is a true vein. Veins which follow the strata, and then cut obliquely across them are common in all parts of the world; the veins in the metalliferous limestones of England are often of this character,

* Most of the above data were obtained from an article of M. Seutis, as quoted from, in the Voyage Metallurgique of M. M. Dufrenoy Elie de Beaumont, etc., to which the reader is referred for further information.



A.—Sandberg Creek.
B.—Delaware and Hudson Canal.
C.—Limestone.
D.—Shawangunk Grit.
E.—Lead Mine.
F.—Shawangunk Mt.
G.—Hudson Slate.

and some interesting examples of the same have been cited at Saint Bel on the Rhone.* The vein-stone is a siliceous material resembling the walls; and the ores, which are blend galena, copper and iron pyrites, occur disseminated through it; crystallized quartz too is associated with them. The whole thickness of the vein varies from two to five feet, and the larger proportion of the contents is the quartose gangue. It is very subject to contractions and swellings, and to changes in the relative proportion of gangue and ore; of the different ores blende is the most abundant, and this with the galena constitutes nearly the whole of the metalliferous portion. Three large masses of pure galena have been found, weighing severally 800, 1000 and 1400 lbs. Two adit levels, seventy-five feet apart, have been driven into the vein, and are connected by an inclined shaft in the vein; several galleries too have been run on the vein; and these workings are at such a depth, that one hundred and fifty feet above were drained by them and ready to be removed at the time of Prof. Mather's visit. It appears then that the vein had been systematically and thoroughly opened. Prof. M. remarks that "The advantages of these mines are,

1. Contiguity to water transportation, and nearness of market.
2. Great depth to which they may be drained without machinery.
3. Abundance and cheapness of fuel for smelting.

The disadvantages are,

1. Uncertainty of the quantity of ore.

* Geologic Appliquee par A. Burat, p. 124.

2. The more or less intimate mixture of the galena and blende.

3. The siliceous nature of the gangue."

The blende, which is so abundant in the mine, is not only injurious by diminishing the quantity of galena; but on account of being so difficult to separate from it, in order that the lead ore may be obtained clean for smelting. The best contrivances for effecting this appear to have been employed, such as stamps or crushers, screens and shaking washing tables.

Many tons of lead have been made here of good quality—reduced in a reverberatory furnace situated on the banks of the canal. The lead is found to be slightly argentiferous, but the quantity of silver is too small to pay for separating.

Since the date of these reports we have no farther accounts of this vein, and it must soon after have been abandoned. Other veins are known on the Shawangunk range in Sullivan and Ulster counties; but they are less promising than the one described.

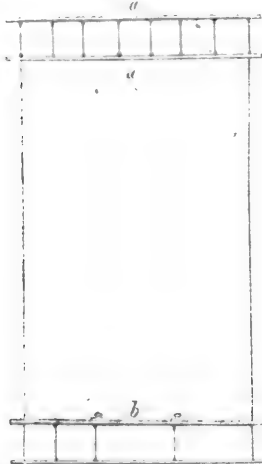
H.

An Account of the Construction of the Britannia and Conway Tubular Bridges.

Continued from page 20.

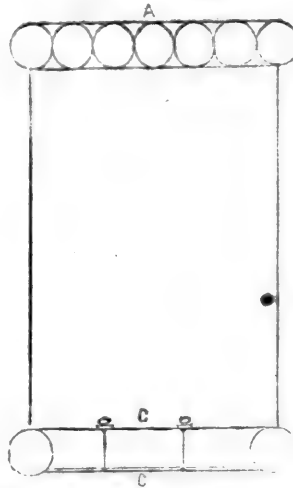
The defective powers of resistance of all the tubes of this shape have suggested a new arrangement and distribution of the metals; it being evident from the experiments that the tube will resolve itself into a huge hollow beam or girder, leaving the two resisting forces of compression and extension as wide apart as possible. It is further conclusive, that the sides must be made comparatively light, and considerable additional material introduced into the top and bottom of the tube. This will give greatly increased strength, and a few more experiments will determine which of the two shall have the preponderance. It is more than probable that the bridge, in its full size, may take something of the following sectional shape (fig. 9).

Fig. 9.



The parts *a, a*, being two longitudinal plates, divided by vertical plates so as to form squares, calculated to resist the crushing strain in the first instance, and the lower parts, *b, b*, also longitudinal plates, well connected with rivetted joints, and of considerable thickness to resist the tensile strain in the second; or it may resolve itself into something of this form (see fig. 10.) with a series of tubes extending the whole length of the upper side, to resist compression, and two tubes with strong longitudinal plates, *c, c*, to resist tension, and prevent tearing in that part—the sides in this case to be made light, in order simply to connect the upper and lower resisting portions of the structure. From the above statement you will perceive that we are still short of the correct form. The experiments are progressively developing facts which I have no doubt will enable me, with the assistance of such an able experimenter and excellent mathematician

Fig. 10.



as my friend Mr. Hodgkinson, to lay before you such results as will fully justify the adoption of this important structure. In the meanwhile I shall be glad to hear from you; and, requesting the favor of your opinion,

I am, etc.,
R. Stephenson, Esq., C. E.

W. FAIRBAIRN.

"I have written the word 'private' at the commencement of this letter, as it is merely written off-hand, in order to put you in possession of the progress we are making in these researches, without being pledged to facts. I should think another week's investigation, which I expect will take place in a fortnight, will enable me to speak more definitely."

"The following letter from Mr. Hodgkinson explains his views respecting the experiments which had been made, and also gives his ideas as to the form of tubes and the experiments which he should recommend for trial. His suggestions were carried out, in accordance with the instructions sent to Millwall on October 2, but the experiments showed that the forms which he recommended were weak and unsatisfactory."

ABERSYCHAN, Sept. 26, 1845.

"My Dear Sir: I have received your letter with the remainder of the experiments, but what to do with them I am quite at a loss. I have no principles to guide me, satisfactory to my own mind, nor the aid from books, which I should have if I was at home. I have done my best to reduce some of the experiments; but the results are so much at variance that I am completely puzzled. What adds greatly to the difficulty is, their want of adaptation to mathematical requirements. I shall not have it in my power to leave this place before the end of next week, without doing the parties a great injustice, but will do all I can on my return. I have been very unwell since my return from London, in consequence of the cold I caught there. I mentioned to you before, that there are fundamental experiments necessary to make any useful application of these of yours; but while I am here I can do nothing, and before I should be at liberty to do anything but try to reduce the experiments made and suggest some modifications of them, it would be necessary to get the sanction of Mr. Stevenson, I suppose. Were I at liberty to make any experiments, I would begin with some cylinders as free from rivets as possible near to the middle, so that they should break in a part not rivetted. This might be done by taking long plates for the middle of the cylinder, and lengthening it out by small plates, since the rivets in them would not signify. I would have three cylinders made, all of the same diameter and length, say 18 or 20 inches diameter at the least, and the length 16 or 17 times the diameter. One of these cylinders should have its plates half an inch thick, and the others one-fourth and one-eighth of an inch. I would have them simple cylinders with one row of rivets on each side—none at the bottom or top near the middle—nor any

aperture made there for the shackle. A section of the cylinder would be as represented in fig. 11,

Fig. 11.



where I would rather there were no rivets: but, as they cannot be avoided, they must be introduced. The length of the cylinder will be as shown in fig. 12. I would have three other cylinders made, of

Fig. 12.



half the diameter and length as the preceding one; and their plates should be of half the thickness as those above, say one-fourth, one-eighth, one-sixteenth of an inch; these cylinders should be rivetted on the side only, as in the former case. If you think well to prepare these for me, I will make the experiments on my return to Manchester; and the results will throw a little light upon the subject and enable me to judge better of the anomalies in your tube experiments. There appears to me, however, to be a great want of fundamental information on the subject.

I am, etc.,
W. Fairbairn, Esq.

E. HODGKINSON.

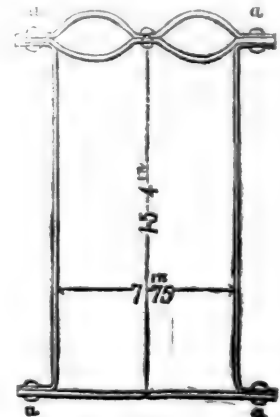
"P.S. I am much in want of a book, 'Navier's Application de Mécanique.' I have thought of sending home for it; but perhaps by the time it arrived I should be ready to return. I know there is something to my purpose in 'Navier.' You have the book likewise."

"Mr. Hodgkinson did not experiment upon these tubes although they were constructed for him, since he found, from the experiments which had already been recorded, that the rectangular forms were decidedly the best; accordingly the models subsequently made for him were of this form. The interval of time which ensued between the experiments on the rectangular and elliptical tubes with single cells, and those on the tube with a corrugated top, was chiefly occupied in preparing this latter tube for experiment. On the 14th of October it was subjected to the usual tests, as explained in the following letter addressed to Mr. Stephenson:

MANCHESTER, Oct. 15, 1845.

My Dear Sir: Our experiments yesterday were the best and most satisfactory we have yet made; and, agreeably to expectation, the form, as per annexed sketch, gave not only the greatest strength,

Fig. 13.



but what was of equal importance, there was a near approximation to an equality of the forces on the top and bottom sides. The figure, you will observe, was in strict accordance with the views contained

in my letter, which followed our previous efforts; the section being a rectangular figure, as above, with a double corrugated plate, the plate for the bottom being 0.18 inch. The sides were only 0.07 in. thick, and the whole rivetted together, as at *a,a,a,a*. With this form of tube (19 feet distant between the supports) the deflections were carefully taken at intervals, from weights of about 1,000 lbs.; and before the tube gave way, which it did by tearing the sides from the top and bottom, it sustained for some minutes a weight of 22,469 lbs. From this last experiment it is evident we are approaching the strongest form; but we are still in want of further investigation, in order to obtain a correct and satisfactory formula for the reduction of the experiments. Some existing formulae from 'Navier' and others can be applied, but they are not satisfactory; and before my friend Mr. Hodgkinson can satisfy himself on the mathematical part of the case, some further experiments must be made on *exceedingly small and greatly enlarged tubes*, with certain functions, calculated to establish the law which governs, not only the strength of the present but all future forms of tubes. This will, however, not create any delay, as I have ordered the plates, and I shall have the tube constructed forthwith, the experiments being made here in Manchester, on account of the more powerful apparatus which we have at command. In the meantime, I think we have sufficient data to guide you as to the security of such a structure; and provided you will fix time and place where we can meet, I shall lay before you such information as will, I trust, justify the measures you intend to adopt. Any day after next Tuesday I could meet you in London or elsewhere.

I am, etc., W. FAIRBAIRN.
R. Stephenson, Esq.

"It is from this period, says Mr. Fairbairn, that I date the disappearance of almost every difficulty respecting the construction and ultimate formation of the Britannia and Conway tubes. The powerful resistance offered to compression by the cellular form of top, as exhibited in the last experiment, at once decided, in my mind, the form to be adopted in those for the large tubes, and from this time forward I had no doubts as to the practicability and complete success of the undertaking."

The great point, now, was to deduce a formula which could be applied to the designing of the large tubes, and the experiments of Mr. Eaton Hodgkinson were more particularly directed to that object. On February 9th, 1846, Mr. Stephenson presented his report to the Chester and Holyhead railway company, in conjunction with reports by Mr. Fairbairn and Mr. Hodgkinson. In this report Mr. Stephenson avoids committing himself to any definite opinion on the subject of the suspension chains—Mr. Hodgkinson recommends that suspension chains be employed as an auxiliary, as otherwise great thickness of metal would be required to produce adequate stiffness and strength. Mr. Fairbairn states that, "provided the parts are well proportioned, and the plates properly rivetted, you may strip off the chains, and leave it as a useful monument of the enterprise and energy of the age in which it was constructed."

Mr. Hodgkinson appears to have had so much difficulty in satisfying himself as to the proper form to be adopted, and the directors to have become so impatient at the delay which had already taken place, that Mr. Fairbairn proceeded to work the problem out for himself. A model one sixth of the real size, was made, with square cells, and, after several experiments, the following formula was deduced, which Mr. Fairbairn states to be that now employed for his patent girders.

Let W = breaking weight; l , the distance between the supports, in inches; a , the area of the bottom side, in inches; d = the whole depth of the beam in inches; then,

$$W = \frac{80 a d}{l} \text{ tons.}$$

The following experiments on the large model tube one-sixth of the real size, shows how the strength of the cellular top resisted all attempts to crush it until the last trial, the strength of the bottom being increased at each trial. This tube was 78 feet long, and 75 feet between the supports; 4 feet 6 inches deep, and 2 feet 11 inches wide.

No. of experiments.	Thickness of plate in inches.		Breaking weight.
	Top area.	Bottom	
1	24.02	8.80	79,278
2	12.80	97,102
3	12.80	126,128
4	17.80	148,329
5	22.45	129,009
6	26,781
7	22.45	135,255
8	22.45	135,255
9	22.45	154,452
10	22.45	192,895

REMARKS.

1. Broke by tension.
2. Twisted over.
3. By tension.
4. By tension.
5. Weight left suspended. Tube turned on its [side].
6. Experiment discontinued.
7. Weight left suspended for 9 days.
8. Broke by tension.
9. Broke by tension.
10. Crushed on the top.

The first of the Conway tubes was tested, and gave the following results: Rectangular tube, 412 feet long, 25 feet 6 inches deep in the middle, 15 ft. wide, and 400 feet between the supports. Area of the top, 670 inches, ditto of bottom, 517 inches.—Computed weight of tube, including rails and cast iron frames at the ends, 1300 tons.

No. of Exp.	Deflection. Inches.	Weight. Tons.
1	7.91	0
2	9.02	95
3	9.50	154
4	10.50	201
5	10.95	301

REMARKS.

The weight of the tube, 1300 tons, gave a deflection of nearly 8 inches, and 95 tons left in the inside of the tube for 4 hours increased the deflection from 9.02 to 9.25. This weight was continued for 17 hours, with an increase of deflection .1 inch.

After this, 301 tons, exclusive of the weight of the tube, were laid on, when the experiment was discontinued. The first weight, 95 tons, was spread over a surface of 70 feet in length of the tube in the middle: the second weight was laid over a surface of 105 feet in the middle; the third over a surface of 150 feet in the middle: the last over a surface of 190 feet in the middle.

THE GOLD-BEARING QUARTZ OF CALIFORNIA.

Mr. Wright's Specimens and Investigations.

In our last publication, we alluded briefly to the interest which had been excited here by the exhibition of some fine specimens of gold bearing quartz, said to be found in inexhaustible masses or quarries, through the whole mountainous region which forms the western slope of the Sierra Nevada. We have since had an opportunity of examining these specimens, and of learning, more minutely, the character of the rock, the tests to which it had been subjected, and the results which it has given. We desire to avoid all exaggerated statement upon a subject in regard to which the attention of the world is already sufficiently awakened; yet we deem it not too much to say, that the facts thus indicated in regard to the character and structure of this vast mountain range, appear to us altogether to surpass, in importance, any previous discoveries in the gold region, which have yet been made public. We are glad to learn, that the whole subject will very soon be brought, in an authentic shape, to the attention of the public, in the form of a full and comprehensive report to the department of state at Washington, by the Hon. T. Butler King. As early as June last, Mr. King devoted two entire months to the laborious exploration of the whole region, and fully matured his conclusions in regard to it. His labors were interrupted by a severe, protracted illness, but his report will now soon be completed, and will doubtless, we trust, reach Washington before the discussions upon the California question shall have come up in Congress.

We hazard nothing in saying that the facts and the views to be set forth in his report will command the public attention and interest to an extent almost,

if not altogether, unexampled by any similar document. As Californians, we await its publication with impatience, Mr. King, we learn, will take to Washington with him, a full collection of specimens of the gold formations, both pure and in union with the quartz, which will fully illustrate and demonstrate, with almost mathematical clearness, his theory of the gold region of California.

The particular specimens which we have seen of these quartz mountain quarries, are in the possession of Mr. Wright, one of the members of Congress elect from California, who will take them on to Washington in the steamer of the 1st of December. They consist for the most part, of small pieces of quartz rock, generally of a brownish tinge, and, in some instances, presenting the appearance of slight incipient decay, or decomposition of the rock formation. In all these specimens, the gold points, or particles, are very slightly, if at all, visible to the naked eye. The microscope, however, reveals the gold more clearly.

Besides these pieces which Mr. Wright has himself selected, with great care, as the fairest average samples of the general appearance of quartz, there is also one larger fragment of the same rock, weighing, we should suppose some ten or twelve pounds, from all parts of which the gold protrudes plainly, in a state almost pure. This single fragment of quartz, which Mr. Wright by no means regards as an average sample of the quarries, but which he pronounces to be the richest stocks specimen he has seen, is found, by the most careful specific gravity test as applied to it by Mr. Wright, to contain pure gold to the amount of about six hundred dollars. This piece of rock, we understand from Mr. Wright, is destined to be laid (as a memorial from the California mountains, we suppose,) upon the table of the speaker of the house of representatives. Its appeal, we think will be heeded.

But the interest or importance attaching to this or to any other single and isolated fragment specimen, however peculiar and curious and rich in itself, is very slight and even inconsiderable, in comparison to that which belongs to the more numerous fragments of the quartz, in which very little gold, or none, can be discerned by the naked eye, and which have been cautiously selected by Mr. Wright on the spot, as the fairest average specimens of whole veins and quarries, and sweep visibly in sinuous and broken lines through the whole western slope of the Sierra Nevada, and to form vast masses of mountain rock, large enough and numerous enough to freight many times over all the navies and commercial marine of the world. Mr. Wright has spent, he informs us, much of the past season among the mountains collecting his samples of the quartz in different localities, and subjecting the yield of gold from them, in very many instances, to the most rigorous tests.

In all these experiments Mr. Wright has been guided by the skill and judgment of Mr. Augustus Leitch, a gentleman largely conversant with mining operations, and who has been from the first equally interested with Mr. Wright in all the researches which have been made.

The astonishing result brought out by these investigations is that in a particular and very extensive vein, four pounds of this rock yielded upon the average eleven dollars worth of pure gold, valued at sixteen dollars to the ounce. That is to say, the yield of gold from these average samples of the rock in this particular vein, is nearly three dollars for each pound of quartz. Mr. Wright exhibited to us two small masses of gold, each about the size and shape of a large musket ball, and both presenting the granulated appearance of gold extracted and collected by the aid of quicksilver. One of these contains about twelve dollars of pure gold, and is the largest yield which has been obtained from four pounds of the rock from the vein in question. The other contains about twelve dollars, and is the smallest yield which has been obtained from any of the experiments upon the rock of this vein. We understand that the tests applied have been sometimes the test of the comparative specific gravity of the pure quartz and the gold bearing quartz.

The samples of the rock which Mr. Wright has tested have been taken from many different veins. If no sample tested has the yield been less than one to the pound of quartz. The average yield of the different veins has been, as determined by the sam-

ples, from one dollar and a half to two dollars to the pound of rock.

A single fact will show the unheard of and astonishing character of the results which have been thus arrived at. Mr. Wright informs us that he has conversed with an intelligent gentleman, now in this country, who has been long conversant in the capacity of an overseer, with mining operations, as carried on in the quartz veins of Georgia. From this source, Mr. Wright learns that a fifteen horse team power, working twelve stamps, will stamp about a thousand bushels of quartz rock in a day—each bushel of quartz weighing about eighty pounds. If twenty-five cents worth of gold is yielded from each bushel of eighty pounds, the business is considered a good one in Georgia. If the yield be fifty cents to the bushel, the profit is large. Now the yield of the rock which Mr. Wright has collected and tested, instead of being a quarter of a dollar, or half a dollar to the seventy-five pounds, is, in one great vein, nearly three dollars to one pound. Abate this, in view of the possible or probable mistake, or in view of the superior yield of a single richer vein, to an average of two dollars, or of one dollar, or of half a dollar, to the pound, and the result still remains, in every point of view, almost equally unexampled and momentous.

The whole question is, does gold-bearing quartz, making any approximation to any such yield, exist in California, in vast and inexhaustible masses? On this main point the recent investigations of Mr. Wright coincide entirely with the observations and conclusions of Mr. King, and with the testimony of all the explorers of the region with whom we have conversed. They all agree that a large number of veins of quartz permeate visibly the western slope of the Sierra Nevada running mainly from north to south, and throwing out branches from the main lines, at intervals in every form, and in all directions. Mr. Wright, we learn, is so well assured of the reality of the results at which he has arrived, that, in connection with his partners, he has already, at a large expense placed a number of men at work on one of the localities which he has observed, and which he states to be, apparently, scarcely more promising than many others—has sent for a mule of quartz rock, to take with him to Washington, across the Isthmus—and has already forwarded to the Atlantic side a large order for machinery suitable for the mining operations which he contemplates.—*Pacific News*, Nov. 30.

From the Miners' Journal.

The Anthracite Coal Trade.

The last number of the Miners' Journal publishes its annual official tables of the coal trade, from which we ascertain the quantity of anthracite coal sent to market from the different regions in 1849 and also 1848, to be as follows:

	1848.	1849.	In. & Dec.
Schuylkill.....	1,216,233	1,115,918 dec.	100,315
Railroad.....	436,602	489,208 in.	52,605
Pinegrove....	61,530	78,239 do.	16,769
	1,714,365	1,683,425 dec.	30,940
Lehigh.....	680,746	801,246 in.	120,500
Lac'wana....	437,500	454,240 do.	16,740
Wilkesbarre..	237,271	559,080 do.	21,809
Shamokin....	19,355	19,650 do.	294
		25,000	
	3,089,238	3,242,641	
		3,089,238	

Increase from all the regions, 1849..... 153,403 tons.

Of the quantity sent to market Schuylkill county furnished... 1,683,425 tons.
All other regions..... 1,559,216 "

Excess in favor of the Schuylkill region..... 123,209 tons.

Of the quantity of coal sent to market since the commencement of the trade, Schuylkill county has furnished..... 13,760,575 tons.
All other regions..... 11,363,205 "

Total quantity..... 25,123,379 tons.

Lehigh Coal Trade.—The Lehigh region sent to

market during the year 1849 801,246 tons, against 680,746 in 1848—being an increase of 120,500 tons during the past year.

Coal Trade of the Line.—The quantity of coal delivered on the line between the coal regions and the permanent bridge, during 1849, was by railroad..... 145,582
do. do. canal..... 83,708

Tons..... 239,290

In 1848 the railroad delivered 182,312, and the canal 70,525—in all, 252,837 tons. Decrease, in 1849, 13,549 tons.

The stoppage of iron works and factories on the line, during the portion of the season, was the cause of the decrease in consumption on the line.

Tonnage of Boats on the Canal.—We give below the average quantities carried by boats on the canal, and also the maximum load from the different shipping points in this region, except Port Clinton, which we could not obtain in time:

	Average load.	Maximum load.
	Tons.	Tons.
Port Carbon.....	108	187
Mount Carbon.....	137	177
Schuylkill Haven....	106	182

When the canal was first completed in 1825, the boats carried from 15 to 20 tons—25 tons was considered a large cargo of coal. It is believed that boats may be constructed to carry a cargo of 200 tons on the Schuylkill canal. It is now one of the most noble improvements of the kind in the country, and we feel confident, that the day is not far distant when the stockholders will be properly rewarded for their enterprise.

The Boat Loan company, we learn, are building fifty additional boats for next years business, and a number also will be built by individuals.

Reading Railroad.—The coal transported over the road during the year 1849, was distributed as follows:

	Richmond.	Phil.	Lines.
From Port Carbon.....	258,643	45,073	49,211
" Pottsville.....	111,330	7,894	20,114
" S. Hav'n.....	365,023	71,324	52,113
" Port Clinton....	68,372	41,678	24,144

	145,581
To Philadelphia.....	165,969
To Richmond.....	804,368

Total tons..... 1,115,918

The present machinery of the railroad was not worked up to its full capacity during the last season, by about 200,000 tons; therefore it is presumed that no increase will be made to it during the present season.

Of the 1,115,918 tons of coal sent to market by this railroad, about 800,000 tons were sent to Richmond—the balance to Philadelphia, and on the line of the road.

The toll received for coal was 1,675,000 dollars. The total receipts on the railroad are about 1,935,000 dollars, expenditures about 985,000 dollars, leaving 1,000,000 profits, yielding 6 per cent. on about \$16,500,000, the amount invested in the road and machinery.

The company employed during the year 900 men 86 locomotives, and 5,033 coal cars.

Schuylkill Navigation.—This canal is 108 miles long, and up to the present time has cost, \$8,445,310 37. Its capacity when opened in 1825, was for boats carrying about 20 tons—during the last season, a boat carrying 187 tons, passed through this navigation, and its capacity will soon be capable of passing boats carrying 200 tons. The quantity of coal carried to market last year was 489,208 tons. The tolls received on coal amount to 312,523 37 dollars. The largest quantity of coal sent to market by this avenue, was 584,692 tons in 1841, 95,715 tons more than last year. The following is the total estimated investment in the work;

Capital stock.....	\$1,665,000 00
Loans.....	6,790,219 37
330 boats at a cost of.....	800,000 60
1600 horses at a cost of.....	80,000 00

\$9,335,819 37

The number of boatmen employed on the Schuylkill navigation is estimated at 1500.

Commercial.

Trade of Buffalo.—The principal articles received at Buffalo via the lakes, from the opening to the close of navigation for the past four years were as follows:

	1846.	1847.	1848.	1849.
Flour, bbls.	1,375,500	3,857,500	1,249,000	1,207,435
Pork "	79,420	63,700	65,000	50,951
Beef, "	28,252	38,900	54,812	61,996
Seed, "	17,640	22,536	22,020	21,072
Bacon, * lbs.				5,193,900
Lumber, ft	17,536,000	17,313,000	21,425,000	33,930,768
Wool, lbs.	21,000	20,223	40,024	49,072
Fish, bbls	6,499	3,943	6,623	5,963
Tobacco, hhds	3,022	1,114	385	2,057
Hides, No.	50,660	64,280	70,750	62,910
Lead, pigs	25,960	16,748	27,953	14,742
Pig iron, tons	2,200	3,856	4,132	3,432
Coal, "	4,430	7,717	12,950	9,570
Hemp, lbs.	26,021	1,062	866	414
Wheat, bu	4,745,000	6,489,100	4,520,117	4,943,978
Corn, "	1,415,308	2,862,300	2,208,100	3,321,651
Oats, "	290,000	446,000	500,000	362,285
Rye, "	28,250	70,787	17,809	5,253
Lard, lbs.	6,100,300	3,436,000	5,632,112	5,311,037
Tallow bbls	4,045	3,035	4,490 lb.	1,773,650
Butter, lbs	3,510,000	5,079,300	6,873,000	9,714,170
Ashes, casks	24,612	7,338	9,940	14,580
High wines	15,031	18,100	38,700	38,753
Leather, rls.	9,998	4,960	3,313	3,870

* In 1846, '47 and '48, included in Pork.

Importations for 1849.

The following statement, in the Washington correspondence of the Tribune is deserving of attention, as showing the practical operation of the present tariff, in the large consumption of foreign articles which it creates:

Summary Statement of the quantity and value of goods, wares and merchandise imported into the United States during the year ending June 30th, 1849.

GOODS FREE OF DUTY.	
Gold and silver coin and bullion.....	\$6,651,240
Tea, 16,319,789 lbs. valued at.....	4,074,789
Coffee, 165,334,700 lbs. valued at.....	9,058,352
Copper, in plates for sheathing vessels.....	1,044,755
Other sheathing metal....	220,036
Copper ore.....	177,736
Other articles free of duty..	1,152,857
Total amount free of duty.....	\$22,877,665

GOODS PAYING DUTIES.	
Manufactures of wool and carpeting.....	\$13,704,606
Manufactures of cotton....	15,754,841
" of silk.....	14,175,767
" of silk and worsted & camblets.	2,487,305
" of flax and hemp.....	6,427,016
Linen and cotton laces and insertings.....	340,366
Ready made clothing and other articles of wear...	587,590
Hats, caps and bonnets...	1,150,964
	\$55,128,455

IRON AND STEEL.	
Bar iron manufactured by rolling, 173,457 tons, valued at.....	\$6,060,068
Bar iron manufactured otherwise, 1,598 tons, valued at.....	525,770
Pig iron, 105,632 tons, valued at.....	1,405,613
Hoop and sheet iron, 25,028,782 lbs., valued at...	543,256
Steel, 6,690 tons.....	1,227,188
Manufactures of iron and steel, cutlery and hardware, inclusive.....	5,297,116
	\$15,058,961

LEAD, COPPER, TIN AND BRASS.

Copper and manufactures of copper and brass.....	1,397,845
Lead, and manufactures of lead.....	86,257
Tin, and manufactures of tin.....	1,903,440—1,387,542
Watches and parts of watches.....	1,676,606
Metallic pens.....	74,050
Porcelain, China and other earthen ware.....	2,483,219
Opium, 92,063 lbs. valued at.....	190,316
Raw hides and skins.....	3,507,300
Wool, 17,869,022 lbs. valued at.....	1,177,347
Leather.....	434,765
Gloves for men, women and children.....	772,217
Other manufactures of leather.....	253,143—\$1,460,125
Wine in casks, 5,186,437 gallons, valued.....	1,269,344
Wine in bottles, 160,092 doz., valued at.....	551,813
Distilled spirits, 3,402,859 gallons, valued at.....	1,821,255
Molasses, 23,796,806 gals., valued at.....	2,778,174
Sugar, sugar candy and syrup, 259,326,584 lbs. valued at.....	8,079,739
Linseed oil, 1,163,647 gals. valued at.....	487,920
Saltpetre.....	462,065
Soda.....	637,965
Tobacco, snuff and cigars.....	1,720,306
Hemp, unmanufactured, 86,892 cwt., valued at.....	491,633
Manilla and other hemp of India, 36,806 cwt., valued at.....	196,634
Flax, and tow of flax and hemp, 21,809 cwt., val. at.....	284,357
Rags, 14,941,236 lbs. valued at.....	524,755
Salt, 11,622,163 bushels.....	1,438,981
Coal, 196,213 tons.....	406,282
Fish, 188,593 bbls.....	633,053
Potatoes, 71,553 bushels.....	20,602
Articles not specified, paying 5 per ct. do. do. do. 10 do. do. 15 do. do. 20 do. do. 25 do. do. 30 do. do. 40 do.	1,702,012 1,030,131 286,078 1,893,652 155,090 1,641,737 141,741
All other articles.....	10,607,534
Total products paying duties.....	125,479,774
Total products free of duty.....	22,377,665

Total imports for year ending June 30 1849.....147,857,439

The whole quantity of iron, steel, castings, anchors, chains, cutlery, hardware, and all other manufactures of iron and steel, amounted to about 345,000 tons. The weight of the hardware and some of the cutlery not being stated, the exact number of tons cannot be ascertained with any more certainty than is above given.

Pennsylvania.

Pennsylvania and Ohio Railroad.

The annual meeting of the company was held at Pittsburg on the 10th instant. The report of the directors was read by the president of the company, the most material parts of which we give below:—

The report of the board of directors submitted to the stockholders on the 18th day of January, 1849, embracing only a few months of the then corporate existence of the company, was necessarily confined to a brief detail of the incidents connected with its primary organization—a statement of the amount of stock subscribed, which was barely sufficient to authorize the issue of letters patent, and the limited operations of the engineer corps, in preliminary explorations and surveys of the country through which the road was designed to penetrate.

The company was then in its earliest stage of infancy, with limited means, adverse interests, conflicting opinions, and jealous rivals, to contend with at every step of its progress. The board has now, however, the pleasure to congratulate you on the disappearance of many, if not all the minor difficulties, and an accession to the stock of the company, from \$50,000, to over one million of dollars, subscribed by respectable individuals and corporations. The amount of capital stock, though yet inadequate to the entire completion of the whole work, was, however, deemed fully sufficient to authorize the board in placing a large portion of the work under contract, which has, accordingly been done, from the mouth of Beaver to the Ohio state line, a distance of 23 miles. From a point near the intersection of the Cleveland and Wellsville road to Massillon, 22 miles, and five miles of the only difficult part of the route, near the eastward of the town of Wooster, an aggregate of 50 miles.

The line from hence to Big Beaver, 25 miles, is now nearly prepared for letting, and it is designed by the board to place it under contract in season to commence work early in the spring, and prepare it for the track within 12 months from the commencement of the work, together with the division from Beaver to the state line.

The subscriptions in Columbiana county yet fall short of the sum which the board deem necessary to authorize it in placing the work in that county under contract; the assurances, however, recently given on that subject, justify the conclusion that the subscription will speedily reach the required sum, and that portion of the work proceed simultaneously with the Ohio river line, and closing the contracts continuously from hence to Massillon. Beyond that point, to the 5 miles letting, near Wooster, heretofore adverted to, the character of the work is so favorable that it can be readily completed in a very short period; true economy, therefore, would dictate a brief suspension of that interval of the road until the heavy jobs, near Wooster, have been for some months in progress, all of which can be completed simultaneously with the eastern division.

The contractors commenced work about the 1st of September last, and have been steadily prosecuting their respective contracts, several of which are nearly completed, and the whole line hence to Wooster, 130 miles, may be prepared for the rails by the spring of next year.

You will have perceived from preceding remarks that it is the design of your board, should no unforeseen obstacles arise, to place under contract the whole line not heretofore let, between this city and Wooster at a very early day, and prepare the road bed for the rails which it is believed, with adequate means, may all be accomplished within the present year, with the exception of a few heavy contracts to be completed in the following spring. If the requisite funds are provided with sufficient promptitude, it is the opinion of the Chief Engineer that the whole line can be in use, and the trains running to Wooster in the autumn of 1851.

Where the undulations of the country require the line to deviate from a level, the grades in all cases are less than 50 feet to the mile, and there is no curve of a less radius than 1000 feet. From Wooster westward, by Loudonville and Mansfield to the intersection with the Cleveland, Columbus and Cincinnati railroad, and the proposed point of junction with the Bellefontaine and Indiana railroad, the distance will be about 50 miles, requiring no grade exceeding 26 feet per mile.

It is highly gratifying to perceive the rapid and growing importance which the work you have undertaken has assumed in one short year. It is now confessedly esteemed throughout the country as the second link in the great chain of internal intercourse which is speedily to unite the Atlantic cities of our inland seas—of the Ohio and Mississippi valleys—and ultimately the Pacific coast, by the shortest and best route, rendering Pennsylvania like Palestine of old, the thoroughfare of nations.

The remainder of the report is chiefly taken up in presenting the inducements to the construction of this road in its business prospects, and in vindication of the route finally selected. In reference to this the report says:

The lines of railroad heretofore constructed and

in progress from the Ohio river to the lakes, received their impetus from the great barrier which the Allegheny Mountains presented to the speedy and convenient transit of travel and trade between the west and the east—the facility of their construction and connection with the New York railroads, by means of the navigation of Lake Erie, thus turning the northern confines of Pennsylvania, and operating to a ruinous extent upon the interests of the state, by the division of a large portion of the summer transportation and travel. Thus the Cincinnati and Sandusky, the Cleveland and Columbus, the Mansfield and Sandusky, and the Wellsville and Cleveland roads, from their very nature and geographical position, are calculated to diminish the travel, and, consequently, the trade through this city, by inviting them to the lakes before they reach its borders. The construction of your road, however, will not only neutralize the existing tendency in that direction, but ultimately and inevitably (in connection with the Pennsylvania railroad surmounting the barrier of the Alleghenies) force them to become our tributaries, by the fact that we shall offer at every point of contact with their roads a difference of distance to the seaboard, varying from 80 to 140 miles in our favor; then will these roads, which heretofore operated to abstract, pour in from the southwest, and the northwest, from the Ohio and the lakes, like their own natural tributaries, an exhaustless stream, swelling the tide of trade and travel to overflowing upon the great central avenue through Pittsburgh and Pennsylvania.

A single illustration will suffice. Thus a traveller from Cincinnati to New York or Philadelphia, those great emporiums of commerce, will, at Columbus, be as far advanced on his journey, by taking the Ohio and Pennsylvania railroad, as though he had travelled the whole distance from that city to Cleveland, and when even at Cleveland, by taking the route leading through Pittsburgh, he would be eighty miles nearer New York; and should Philadelphia be his destination, he will be 260 miles nearer his journey's end than by pursuing the lakes, or even by a lake shore route—should the right of way be ultimately obtained, from the constituted authorities of Pennsylvania. Figures, it is truly said, lie not. The distance from Columbus to New York, via Pittsburg and Philadelphia, is ascertained by the results of experimental surveys to be 660 miles. The distance from Cleveland by the lake or lake shore to New York, is 665. The distance from Columbus to Cleveland, 135 miles, actually saved. Time is economy; distance is money; and the rate of fare regulated as it will be by distance, is money, and all combined must and will regulate the great stream of travel. The same causes and the same reasoning prevail with regard to the influence of our roads from the lakes as from the Ohio. Thus, at Cleveland, a traveller is 80 miles nearer New York, by the Pennsylvania routes; at Sandusky, by the Mansfield road, 54 miles are saved, and at Toledo, Adrian, and every point on the Southern Michigan railroad, on to Chicago, the young queen of the lakes, the same relative advantages in time, distance, and economy of travel prevail.

The report of the president is a very interesting document, and we regret that we cannot publish the whole of it. Accompanying it is a letter from Mr. Roberts, Chief Engineer of the road; but as it contains little that is not embraced in the report of the President, and as it is soon to be followed by a more detailed report of matters more particularly belonging to his own department, we omit any extracts from his letter at the present time.

The formation of a continuous line of railway from Philadelphia to the western boundary of Indiana, is one of the greatest projects of the kind ever yet attempted; and as the work of constructing the several links is going on simultaneously, every person who is engaged upon the different sections of it regards himself as a party to the work as a whole—and the importance of the local lines is almost entirely lost in the idea of the vastly greater work which is to result from the united labors of all.—

Such a conviction gives us the surest guarantee we can have of success, both as regards the providing the necessary means and the vigorous prosecution of the work.

Portland and Montreal Railroad.

We learn that Messrs. Wood, Black & Co., the contractors for this road, have purchased of the Coalbrook Dale Company 10,000 tons of rails for the Portland and Montreal railroad, one half deliverable in Portland at \$44 per ton, and the other half at Montreal at \$36 per ton, free of duty and all charges.

We are assured too, that the work of construction is going on vigorously at each end, under the contract for its completion in three years.

Coal Trade of Baltimore.

The following is a monthly statement of the quantity of coal transported over the Baltimore and Ohio railroad during the year 1849:

January.....tons..	4,531	August.....tons..	12,852
February.....	7,043	September.....	16,383
March.....	9,838	October.....	13,425
April.....	9,537	November.....	15,917
May.....	11,183	December.....	6,186
June.....	15,622		
July.....	13,286	Total.....	135,776

Some portion of the above was for intermediate points along the line of the road between Cumberland and Baltimore, and did not come into Baltimore.

Virginia.

Interesting Statistics.—Under a resolution of the House of Delegates, the 1st Auditor, Jas. E. Heath, Esq., has laid before that body a very important document showing

I. The white population in 1849 of each of the four grand divisions of the commonwealth, calculated from the titheables, and which will be verified by the census.

II. The revenue which each division pays, with and without the taxes on licenses.

III. The apportionment of representation to each, on the 1st the white basis, 2d the white and revenue basis, without the taxes on licenses, and 3d the mixed basis of white population and license taxes.

We give a brief synopsis:

1. POPULATION.

1. Or tide water Division.....	192,660
2. Or tide water to Ridge Div.....	209,970
3. Valley " ".....	160,557
4. Trans Alleghany " ".....	324,530

887,717

White population in 1840.....740,968

Increase in nine years.....146,968

2. REVENUE.

1. Div.....	\$163,977 25	\$262,385 63
2. ".....	155,512 07	194,492 63
3. ".....	77,572 36	98,628 71
4. ".....	75,494 63	105,506 53

\$472,516 31 \$661,013 50

3. APPORTIONMENT OF REPRESENTATION.

1st. WHITE BASIS.

	Delegates.	Senators.
1. Div.....	29	7
2. ".....	32—61	7—14
3. ".....	25	6
4. ".....	49—74	12—18

Western maj. 23 in House and 4 in Senate.

2. MIXED BASIS.

	Without Licenses.	With Licenses.
	Del.	Sen.
1. Div.....	38	9
2. ".....	38	9
3. ".....	24	6
4. ".....	35	8

Eastern majority in the House 17, in the Senate 4, on the basis of white population and revenue without licenses; or 19 in the House and 6 in the Senate, with license.

Massachusetts.

We gather from the late Message of the governor of this state the following statement of its financial condition:

The receipts for the past year amounted to.....\$540,658 35
The expenditures to.....601,604 23

Excess of expenditures over receipts... 60,945 88

The above amount of receipts includes

cash on hand, Jan. 1, 1849.....11,354 64

Railroad stock sold.....13,400 00

State Reform School scrip sold.....25,000 00

This sum.....\$49,754 64

deducted from the whole receipts 540,658 35, leaves 490,903 71 as the ordinary receipts for the year.

The amount of expenditures includes

the sum paid the State Reform School under the act of 1849.....25,000 00

Railroad loans.....9,000 00

Temporary loans of 1847, repaid.....15,000 00

Temporary loans of 1848.....10,000 00

Balance paid for weights and measures 29,395 00

This sum.....\$88,395 00

deducted from the whole expenditure, 601,604 23, leaves, as the ordinary expenditure of the year, 513,209 23.

The receipts for 1849 are less than the estimate of the Treasurer, made early in the year:

From the auction tax, about.....11,000 00

And from alien passengers.....27,000 00

Making.....\$38,000 00

The alien passenger money was cut off by the decision of the Supreme Court of the United States which pronounced the law of the state, by which it was imposed, unconstitutional. But for that decision the revenue of the year from that source would probably have been increased more than thirty thousand dollars.

The property of the commonwealth consists of

Western railroad stock.....1,000,000 00

Western railroad stock sinking fund 593,000 00

Commonwealth's part of Western

Railroad loan sinking fund.....123,500 00

Notes for lands in Maine.....1,758 00

Cash on hand.....4,000 00

\$1,722,258 00

The debt of the commonwealth:

Western railroad scrip, due in 1847,

is.....995,000 00

State Reform School scrip.....25,000 00

Temporary loans.....65,000 00

Making.....1,085,000 00

Her lands in Maine are estimated at 1,500,000 00

Her claims upon the General Government.....181,000 00

1,681,000 00

The Massachusetts School Fund

amounts to.....903,000 00

The School Fund for Indians.....2,500 00

Charles River and Warren Bridge

Fund.....21,481 18

\$926,981 18

The commonwealth has heretofore pledged her

faith for the payment of the debts of certain rail-

road corporations. These corporations promptly

pay the interest which accrues on their debts, and

the state is amply secured by mortgages against

future contingencies.

presumed, materially influenced by the amount of experience derived from the vehicles which had previously been in use for the conveyance of traffic.

As the new system became extended and improved in all its arrangements, and the facilities which it possessed for conveying greater loads at higher speeds were gradually developed, the working stock was necessarily changed from time to time in conformity with the greater demands for convenience and stability. Improvements in almost every point have been carried out, until we have now in operation the railway stock, generally speaking, in an excellent condition for the purpose to which it is applied. It is remarkable that, notwithstanding the importance of proportion and quality as first elements in considering the strength of the materials of which railway moving stock is composed, no rule, generally applicable, for even the main features of this great system of machinery, has been established. Without attempting to embrace the whole subject, although one of great importance to proprietors of railways and the public generally, I conceive it is proper, in this place, to express my strong conviction that the general question of the strength and quality of those materials justly proportioned to the strains to which they are subject, and bearing reference to accidents from collision, faults of road, deterioration from a variety of causes, &c., must eventually be treated with great attention and consideration; and in order to insure safety to life and property for all who use railways as well as the greatest possible economy for the profit of those who have embarked their capital in their construction, I believe it will be found essential to have some regulations founded upon the joint experience of those parties who have been practically engaged in managing and working the different departments of railways.

It is well known that short-sighted economy has been practised in many instances in giving directions for the purchase and repair of railway stock, and it is only dear-bought experience which can effectually convince those who, to make a little saving by purchasing a cheap, ill-constructed machine, gain a great and constant loss while it is in use.—The advantages of a general and constant interchange of opinion among those parties to whose judgment and management the working expenses of the different railways are entrusted is most important; and if such varied experience could be collected, regularly and systematically into one focus, where it might be digested and prepared for practical use, the effect for good to the general system of railways would be very great, and, in a scientific point of view, the results recorded would prove highly interesting. Having thus briefly stated a portion of my views as bearing upon the introduction of the best means of producing uniformity in the working stock of railways, I will now proceed to consider railway axles, which, as an important part of the great machinery, are deserving of the most marked attention.

I have endeavored to ascertain whether any data were available which might assist me in forming a groundwork of the results of combined experience on this subject; but I regret to say that, although my inquiries have been in all cases promptly and carefully attended to, yet the object which I had in view has not been attained. As an example of the diversity of opinion, or rather, perhaps, the want of some certain rule to guide engineers in proportioning the strength of axles to their weights and strains, I would refer to different forms of axles now in use on one portion of one railway, and in doing so would remark, that a clearer proof could not be afforded of the desirableness of having some defined principle to guide us in deciding on the strength for railway axles. For obvious reasons I wish particularly to guard against expressing, directly or by inference, any opinion on any description of manufacture of axle, or even quality of iron of which axles are composed. I would wish to limit the scope of the present paper simply to the question of form and dimensions of axles, with the changes and deterioration to which they are subject in process of working, assuming, in all cases, the material of which the axle is made, and the mode of manufacture, to be of the most approved description.

In order to arrive at a knowledge of the best form and dimensions of axles, we have first to ascertain

the load and friction to which they are to be exposed; and secondly, to estimate, as nearly as possible the strains to which they will be subject whilst in motion. Supposing a waggon or carriage to be constantly in a state of rest, it would, of course, then only be necessary to consider the axle as a beam or girder, sustaining a load of five tons upon the two journals, the points of support being the wheels resting upon the rails, the middle portion of the axle being of sufficient strength to sustain the wheel or prop in its perpendicular position. We then require to find out the proportionate strength, so that each section of this beam or girder shall only be sufficiently strong to resist the strain or load to which it is then subject.

It is ascertained by an approximate calculation, that a journal of 1-128-inch diameter is not capable of sustaining a heavier load, when in a state of rest, than 2½ tons, or 5,600 lbs.; and allowing, in practice, that the wagon or carriage axle is made ten times the breaking strength, the diameter of the journal would be, adopting the same calculation, 2-34 inches. In these calculations the strength alone is considered; but we have also to take into account the question of friction, and likewise the tendency to abrasion. With our present means of information, no accurate data are available for determining the best proportion of journal or bearing according to the weight it has to bear, or the velocity at which it is required to move. A great variety of proportion is in use, but it is fair to note that in engine-axles, particularly the length of bearing, depends, to a certain extent, upon the construction and arrangement of the engine; as a general rule, the length of the bearing is not in due proportion, according to our general experience, to the diameter.

—Civ. Eng. & Arch. Jour.

To be continued.

AMERICAN RAILROAD JOURNAL.

Saturday, January 19, 1850.

3,000 Tons Railroad Iron.

THE UNDERSIGNED IS PREPARED TO contract for the delivery of the above quantity at any port of the United States. Can be made of any required pattern and of a favorite brand.

CHARLES ILLIUS,
20 Beaver St., New York.

1m3

The attention of our readers is invited to the large number of new advertisements in our present number, among which is an extensive catalogue of valuable scientific publications for sale by John Wiley, 161 Broadway, and which are standard works upon the various subjects on which they treat.

CHEMICAL ANALYSES OF MANGANESIAN WHITE CAST IRONS. BY CHARLES T. JACKSON, STATE ASSAYER, ETC.

Having received, through the politeness of Messrs W. E. Coffin & Co., some samples of hard white pig iron, I undertook their analysis, for the purpose of determining the proportions of manganese which they contained.

I herewith present the results which I have obtained, trusting that they may prove interesting to iron masters and founders.

Specimen No. 1.—This metal is highly crystalline, resembling in color and structure pure metallic antimony. It is laminar, and bladed, and is very hard and brittle. Its specific gravity is 7.684 pure water being 1. This specimen was broken from a pig of cast iron obtained from Capers furnace in Easton, Pennsylvania. A clean bright piece of the metal, weighing 0.5 gramme was analysed and yielded per cent.—

Iron	91.10
Manganese	5.76
Carbon and silica	3.14

100.00

Specimen No. 2. was obtained from the furnace in Plymouth, Vt., and was made from a brown he-

matite, mixed with black oxide of manganese. The metal is hard, white, brittle and crystalline, and contains flattened crystals in its centre.

The massive metal is made up of crossing plates of crystals, giving its broken surface the appearance of meteoric iron, that has been acted upon by acids. Its specific gravity is 7.488.

Some crystals were broken out, and submitted to analyses, and the following results were obtained:

Iron	83.2
Manganese	9.6
Carbon and silica	10.0
	102.8

Specimen No. 3.—This metal was obtained from the furnace at Woodstock, New Brunswick, and was reduced from a manganesian red-brown hematite. The metal is white, hard, and granular-crystalline, with some small crystalline plates crossing each other. It breaks readily under the hammer, when struck with a smart blow. Its specific gravity is 7.330. On analysis it was found to consist of

Iron	82.22
Manganese	16.26
Carbon	0.36
Silica	1.10

100.24

The ore from which this metal was smelted was analysed in my laboratory, last year, by Mr. Richard Crossley, who obtained the following results:

Silica	17.80
Carb. lime	4.00
Alumina	2.10
Per oxide of iron	52.50
Oxide of manganese	18.00
Water	5.70

100.00

52.50 per oxide of iron contains 36.39 of metallic iron, and 18.90 of manganoso-manganic oxide contains 13.62 of manganese, 36.39 + 13.62 = 50.01 combined metals.

Then 50.01 : 13.62 : : 100 : 27.23 manganese. Hence more than half the oxide of manganese in the ore was reduced in the furnace, and alloyed with the iron, the rest having been removed by combination with the slag.

The nature of these alloys of manganese and iron is not generally known to iron masters and refiners, though many have a practical knowledge of their working, without understanding the principles by which they should be guided. It is known that such kinds of iron will not answer for foundry purposes, and that they are suitable for the manufacture of bar iron, making a very tough and good metal, admirably adapted for conversion into steel. It is known also that iron of this kind works slowly in the puddling furnace, and in the forge, and that it "comes to nature slowly," but makes a good mixture with irons rich in carbon, which "come to nature" too quickly and are liable to "loom up" or to be "hot short," when placed under the tilt hammer; but still grave errors are committed in judging of the metal, from its appearance, and pig iron containing sulphur or phosphorus is not unfrequently mistaken for manganesian iron, and serious losses arise from such mistakes. A series of exact chemical analyses of the different kinds of iron made in the furnaces of all parts of our country, and of the principal varieties of iron which come to this country from abroad, is required, in order to render the metallurgy of iron more perfect and certain.—We ought also to have the principal ores of iron which arrive in this country thoroughly analysed, in order to learn their peculiarities and value.

How much capital might have been saved if

chemical examinations had been made of the ores anterior to the erection of costly furnaces for smelting them! Where analyses are made, it too often happens, that, from an erroneous idea of economy the chemist is limited to the mere determination of the amount of iron in the ore, and is not authorised to make a full and thorough analyses of all the admixtures, which are really of vastly more importance than the mere percentage amount of iron in the ore; for it makes but little difference whether an ore contains 35 or 50 per cent. of iron, the admixtures being far more important, serving for flux in one case, and rendering the iron almost irreducible in another.

It is desirable that we should combine the skill of practical and scientific men together in the examination of the metallurgy of the United States; for they cannot thoroughly work out the problem without mutual aid. We should first review all that is doing here, and then examine what is known in Europe, and apply the knowledge we obtain from abroad to our own works. We ought to have an able metallurgic commission appointed by the government of the United States, to obtain the information desired. France long ago explored, by her commissions, the mines, furnaces, and foundries of Great Britain, and all nations now draw for information upon the "*Voyage Metallurgique en Angleterre, par M. M. Dufrenoy, Elie De Beaumont, Coste et Perdonnet.*"

Boston, January 12, 1850.

Ohio.

Hamilton and Eaton Railway.

The Eaton Register confidently assures the public that the proposed railway from Hamilton will be constructed. The difficulties about routes, &c., are reconciled, and the Directors and Stockholders are busily engaged, arranging matters to locate the road and put it under contract. The Engineer, Erwin, is reconnoitering for a route to Richmond, by way of Paris. No obstacle is found on the route, and the people along the line "manifest a zeal and energy not before witnessed." They are now for going ahead.

Mr. Erwin, in a letter to the Enquirer, says—"I am now fully warranted in asserting that a cheaper line can be obtained by the way of Hamilton and Eaton to the west and northwest, at 30 feet to the mile, than on any other route south or south-west of it, at 40 feet to the mile." This he says "will be proved by a comparison of the field routes, profiles, &c., whenever the surveys are made on the other lines by competent and careful Engineers."

Virginia.

Louisa Railroad—Western Extension.

On Thursday last, the portion of the road, extending from Waynesborough to Staunton, a distance of 12½ miles, was let on very favorable terms. Four miles are taken by Goodman, Seay & Co., and three by Wright and Farish, of Albemarle, and one by Crickard and Brown, of Augusta. The remainder by contractors from Pennsylvania and Maryland. The price ranges between 8 and 9 cents per cubic yard, and the excavation will cost eight thousand dollars less than the estimate of the Engineer. The maximum grade, going east, is 65 feet to the mile, and 68 feet in the other direction. The work is to be finished by the 25th December, 1850. By the fourth of July, 1851, the road from Charlottesville to Staunton will be finished to within a mile of the Tunnel, on each side of the mountain. A portage of about three miles will, for a year or two, interrupt the continuous use of the

steam car.—Passengers will cross the mountain in coaches.—*Lynchburg Virginia.*

Massachusetts.

Boston and Lowell Railroad.—The following gentlemen have been unanimously re-elected a board of directors of this road for the year ensuing:—W. Sturgis, Geo. W. Lyman, Joseph Tilden, Jno. A. Lowell, Eben Chadwick.

Steamboat Building at Pittsburg.

There were built last year in the Pittsburg district 51 steamboats, of which 37 were built expressly for the Pittsburg trade, and 14 for the different points in the west and south. The aggregate amount of tonnage of the whole is 7215 tons.

Canal Commerce.

CANAL COLLECTOR'S OFFICE,
Cleveland, Jan. 1, 1850.

Statement of some of the principal articles of property that arrived at, or was cleared from, Cleveland, by way of the Ohio Canal, during the years 1848 and 1849.

ARRIVED.

	1848.	1849.
Barrels Flour.....	417,524	376,112
" Pork.....	26,111	23,031
" Whiskey.....	41,135	36,233
" Linseed oil.....	1,157	803
Pounds Pot and pearl ashes.....	64,384	194,441
" Pig iron.....	7,077,965	6,344,395
" Butter.....	2,544,394	2,041,854
" Bacon.....	1,620,155	1,145,683
" Lard.....	1,636,803	1,723,861
" Tallow.....	206,828	263,206
" Iron and Nails.....	15,674,989	10,434,591
" Wool.....	1,925,451	1,910,474
Bushels Mineral coal.....	1,925,451	1,910,474
" Corn.....	661,454	517,605
" Oats.....	165,955	13,107
" Wheat.....	1,585,270	851,123
Pieces staves and heading.....	247,941	104,886
Perches stone.....	10,182	12,441
Cords wood.....	4,965	4,267

CLEARED.

	1848.	1849.
Barrels Salt.....	72,400	74,742
" Lake fish.....	9,782	13,225
Pounds Merchandise.....	13,832,416	13,471,180
" Furniture and baggage.....	678,103	738,420
" Gypsum.....	2,259,756	2,133,486
" Castings.....	1,096,026	958,817
" Machinery.....	172,760	55,226
" Ohio Saleratus.....	474,762	346,645
" Pot and pearl ashes.....	268,537	255,342
" Other salts of ley.....	56,756	6,215
" Marble.....	1,563,080	1,414,391
" Hides and skins.....	128,886	226,333
" Clocks.....	58,128	39,010
" Grindstones.....	145,727	258,052
" Feet Lumber.....	4,906,920	7,111,576
Shingles.....	4,556,250	4,662,250
Split Hoops.....	1,840,826	1,244,170
The amount of toll collected at this office during past year is.....		\$88,541 50
The amount collected for the year 1848 was.....		80,510 25
Increase.....		\$8,031 25

Process for Improving Iron.

The Baltimore Sun alludes to some recent tests of an improved process in the manufacture of steel at Coleman's Works, in York, Pa. The invention is by Dr. Wall, of London. It consists in passing a current of voltaic electricity through a mass of fused metal during the time of its melting, cooling or consolidation, either in the blast, puddling, balling or other furnaces, the consequence of which is, that all sulphur, phosphorus, arsenic, or the semi-metals ever, more or less, found in all metals and ores, are evolved or driven off, which, if allowed to remain, would interfere with the molecular arrangement, make the metal brittle and otherwise deteriorate its quality. The tests made show, the Sun says, the improvement embraced in the discovery

to be decidedly the greatest and most economical that has ever been placed within the reach of manufacturers.

The Whale Fishery of 1849.

The Whaleman's Shipping List of New Bedford, publishes a condensed list of the importation of sperm and whale oil and whalebone into the United States in 1849:—

Ports.	Ships and Brigs		Brls. Spm.	Brls. White Oil.	Lbs. White Bone.
	Bks.	Schs.	Oil.		
New Bedford.....	63	1	46,338	72,962	797,300
Fair Haven.....	13	..	10,806	18,998	150,100
Mattapoisett.....	2	1	780	19	..
Westport.....	3	1	2,518	100	500
Dartmouth.....	..	1	8	28	..
Falmouth.....	1	..	2,060	115	..
Edgartown.....	1	..	118	2,742	18,800
Nantucket.....	13	..	18,887	6,461	68,200
Provincetown.....	2	15	2,924	277	..
Boston.....	3	1	1,360	3,445	202,309
Lynn.....	1	..	383	1,580	..
Somerset.....	1	..	140	..	..
Fall River.....	4	..	856	8,049	140,600
Providence.....	2	..	2,317	4,542	30,200
Warren.....	6	..	2,384	10,626	61,500
Newport.....	1	..	1,055	..	..
Stonington.....	8	..	1,628	15,334	97,500
Mystic.....	5	..	1,509	6,747	51,100
New London.....	17	3	1,949	38,030	301,100
Bridgeport.....	1	..	354	2,702	27,300
Sag Harbor.....	16	..	1,797	37,579	186,400
Greenport.....	4	..	587	7,487	78,400
Cold Spring.....	3	..	299	8,697	68,600
New Suffolk.....	1	..	242	314	1,200
New York.....	1	..	195	1,655	..
Quincy.....	..	1	..	1	..

Imports for 1848. 107,976 Brks. Sp. Brks. Wh. Lbs. Bone.
280,656 2,003,000

The exports to foreign ports in 1849 were, from Boston, 93,875 gallons sperm, 93,770 gallons whale. 4500 pounds bone; from New Bedford, 7421 bbls. whale oil.

Georgia.

Central Railroad and Banking Company.—At an election for Directors of the Central railroad and Banking Company of Georgia, held yesterday, the following gentlemen were elected:

R. R. Cuyler,	J. W. Anderson,
Wm. Crabtree,	Solomon Cohen.
Joseph S. Fay,	Henry McAlpin.
Wm. B. Johnston	John R. Wilder,
Thomas Purse,*	

* New Director.

[Sec. Rep.]

Bank Returns.

We have received the annual abstract made by the Secretary of State, of the returns from the several banks in the state, of their condition on the first Saturday in October. At that time there were in operation, 119 banks; 27 in Boston and 92 out of Boston.

Capital paid in.....	\$31,630,011 00
Bills in circulation.....	15,700,935 25
Net profits on hand.....	3,011,996 21
Balances due other banks.....	4,720,815 31
Deposits without interest.....	9,775,316 97
Deposits bearing interest.....	746,415 66
Total due from the banks.....	68,685,490 40

Specie &c. in banks.....	2,749,917 32
Real Estate.....	1,126,161 67
Bills of other banks.....	3,737,151 00
Balances due from other banks.....	4,472,950 72
Debts due, except from other banks.....	56,599,300 69
Resources of the banks.....	68,685,400 40
Dividends in October, 1848.....	834,850 00
" April, 1849.....	1,253,545 00
" October, 1849.....	1,195,947 34
Reserved profits.....	2,724,513 20
Debts secured by stock.....	785,775 63
Doubtful debts.....	193,531 31

By these returns it appears that the specie of the banks amounts to \$2,686,741; and their circulation

and deposits, to \$26,322,667; which is equivalent to \$0.50 of paper for \$1 of specie. The amount of dividends and the amount of reserved profits are particularly deserving of attention; as the dividends, the profits, and the expenses, (which ought also to be included in the returns,) show how great is the absorption which the banking system makes from the public industry.

North Carolina.

A Home-made Locomotive.—We have had the pleasure of examining the new locomotive John M. Morehead, (named after Ex-Gov. Morehead,) which was turned out about three weeks since from the machine shop in this town of the Wilmington and Roanoke railroad company, having been made there, under the superintendence of Mr. Jonathan Lees, who has charge of the shop. It is an 8 wheel engine, of about ten tons weight; is put together in an excellent manner, and performs most satisfactorily. It is in use on the W. and R. railroad. Another, intended to be of considerably greater weight and power, has been commenced in the same shop. Success in every way to North Carolina skill and enterprise.—*Wilmington Chron.*

On Straightening Tempered Steel Work.

I beg to send you a method to bend straight thin steel works which have become twisted in the process of tempering. If you think it would be found useful, I shall be glad if you will give it a place in your valuable work.

If, after tempering, the work has got twisted, I heat a piece of iron proportioned to the size of it, and fix it in the vice, and then pass the convex side of the work over the iron in contact with it, until it becomes as warm as the temper will allow of; and to ascertain this, a part must be cleaned on the concave side to show the color. I then take a wet cloth, and apply it to the convex side to cool it suddenly, and leave the concave side expanded.—While the work is heating, and until after the cloth has been applied, the work must be held at the extremities of the curve, and a little pressure given towards the convex side. This process is well suited for delicate work, as it leaves the fine skin unmarked, which would not be the case if the hammer were used.—*Prac. M. Jour.*

Gas from Water.

We copy the following from the Washington Union, not that we give full credit to the discovery claimed, but rather as a statement of what we have no doubt will eventually be realized. We fully believe that one of the component parts of water is to give us light and heat, but we do not believe that Mr. Paine, at one single bound, has gone so far ahead of all the discoveries that have yet been made in this direction. As he claims to have brought this discovery into use, we shall soon know more about it.

Messrs. Editors:—I am authorized to announce the discovery and practical test of the most important scientific invention ever yet produced or brought to light since the world has been inhabited by man—an invention which must eventually, and almost immediately, produce an immense revolution in the commercial intercourse and business in general throughout the world; and, although it will break down and ruin many of the most important branches of business and avenues of wealth, with hundreds of wealthy corporations and business establishments, yet it will build up thousands of others, and contribute hundreds of millions to the benefit of mankind, especially to the American community.

The first and main feature and foundation of this invention, and which at once opens a field for hundreds of other inventions, is the discovery of Henry M. Paine, Esq., of a ready and almost expenseless mode of decomposing water and reducing it to the gaseous state. By the simple operation of a very small machine, without galvanic batteries, or the consumption of metals or acids, and only the application of less than one three hundredth (1/300) part of one horse power, Mr. Paine produces 200 cubic feet of hydrogen gas, and 100 feet of oxygen gas per hour. This quantity of these gases—the actual cost of which is less than one cent—will fur-

nish as much heat by combustion as 2,000 feet of the ordinary coal gas, and sufficient to supply light equal to three hundred common lamps for ten hours; or to warm an ordinary dwelling house twelve hours, including the requisite heat for the kitchen; or to supply the requisite heat for one horse power of steam. This invention has been tested by six months' operation, applied to the lighting of houses, and recently the applicability of these gases to the warming of houses has also been tested with perfectly satisfactory results. A steam engine furnace and a parlor stove, both adapted to the burning of these gases, have been invented, and measures taken for securing patents thereof.

Mr. Paine has one of his machines, new and elegant, now in full operation, and publicly exhibiting, and may be expected to exhibit the same in this city within twenty days. The only actual expense of warming houses by this apparatus is that of winding up a weight (like the winding up of a clock) once a day; and the heat produced may be as easily graduated and regulated as the flame of a common gas burner. No smoke whatever is produced, but a very small quantity of steam, sufficient to supply the requisite moisture to the atmosphere. In its application to the production of steam power, it will reduce the expense thereof to the mere wear of machinery, and will immediately produce an immense demand for steam engines, and induce the establishment of thousands of manufacturing mills, reduce the expense of travelling, and increase the demand for agricultural produce, while it ruins the coal and gas business, and such manufacturing establishments as depend on monopoly and high prices. This invention, moreover, removes completely the only obstacles which have hitherto existed in aerial navigation—the difficulty of procuring hydrogen gas, and carrying a supply of fuel; and it may now be considered a matter of tolerable certainty that men will be seen swiftly and safely soaring in various directions before the first of May next. These facts, being of immense importance, should not longer be withheld; and I therefore would avail myself of your widely circulating journal to present them to the public.

Yours respectfully,

R. PORTER.

Washington, Dec. 22, 1849.

Great American Mechanical Work.

D. APPLETON & CO. PUBLISH THIS WEEK
A No. 1, with numerous illustrations, price 25 cts.
A DICTIONARY OF MACHINES, MECHANICS, ENGINE WORK AND ENGINEERING;
designed for practical working men, and those intended for the engineering profession. Edited by Oliver Byrne. To be completed in about 40 Nos. Price 25 cents each.

This will be the most practical, as well as the most perfect work ever published on Machines, Mechanics, Engine work and Engineering. The Mechanic, Engineer or Machinist, from the time he commences his profession till he arrives at the zenith of the most successful professional career, will find this an indispensable work of reference.

This volume will be of royal 8vo. size, containing nearly 2,000 pages, 1500 plates, and 6,000 cuts; it will fill up a chasm that has long been a requirement to practical working men, and those intended for the engineering profession. It will present Working Drawings and descriptions of every important machine in practical use in the United States, and independent of its American value as embracing the results of American ingenuity, it will contain a complete treatise on Mechanics, Machinery, Engine work, and the substance of at least a thousand dollars worth of books scattered in expensive folio volumes or magazines.

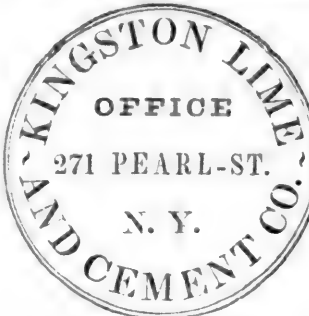
Seventy-five plates are embraced in the 1st No. among which are Atwood's Machine, Air Guns, Air Whistle, American Steam Excavating Machines, Anchors of every variety, Anemometer, "Absorbing and Productive Cascade," Aqueduct Wire and Suspension Bridges, Croton Aqueduct, all the Engineering of this stupendous work, Ancient matter used in the arts, etc.

No. 2 will be published next week, containing 176 plates.

AGENTS WANTED.

Several responsible and active men are wanted as Agents to procure subscribers for the above valuable work. Subscribers may readily be obtained in every city and village of the American continent. A liberal commission allowed. Apply to the Publishers, 200 Broadway.

Hydraulic Cement.



HYDRAULIC CEMENT, OF BEST QUALITY, manufactured at their works, for sale in lots to suit purchasers.

Also, Ground Lime, a superior article for Builders.

ISAAC FRYER, Sec'y.

January 19, 1850.

BALL & CO'S PATENT Indestructible Water Pipe.

We publish below the opinions of others who have a personal knowledge of our Pipe, and would request all persons interested in the conveyance of water to investigate its merits for themselves. It being cheaper than Cast iron pipes, and incomparably more durable (as there is no chance to commence decay but continually grows more permanent) it must supersede it altogether in works requiring durability and purity.—Branching, taping, altering or relaying, is done with the greatest facility, and certainty, without injury, in any size of bore from 3 feet diameter down to 1/4ths of an inch under any head that can be controlled with hose or sewer pipes.

J. BALL & CO.

Corner of Read and Centre Sts., N. Y.

FOR the benefit of those who have requested information in regard to this excellent article, we insert the following testimonials in relation to its merits:

"In answer to the numerous inquiries in relation to J. Ball & Co's Indestructible Water pipe, composed of iron and cement and in use in our village, the undersigned, water commissioners, trustees, and late trustees of the village of Saratoga Springs, take this method of saying that we have perfect confidence in the utility, goodness and durability of said pipe. The village of Saratoga Springs has some 20,000 feet of this pipe, varying from 6 to 14 in. in diameter, under a head of about 80 feet. It has been laid since the fall of 1846. Since it was fully completed, it has cost comparatively nothing to keep it in repair; and, although some portions are exposed to the frost, it seems to stand well the test, and answer all the purposes for which it was designed and constructed. We believe it preferable to iron pipe—is much cheaper and more durable, and we would not exchange it for any other kind of pipe yet invented, if we could without any additional expense or inconvenience. The water comes through clear and pure, and where we have had occasion to take any part of it up to improve or alter the grounds, it appeared to be just as sound and imperishable as the moment it was laid down. This testimony is entirely disinterested, and is now given to avoid the necessity of answering the many calls upon us for information on this subject. We have witnessed and many of us have superintended the laying down of the pipe in this village, and watched its operations since, and are perfectly satisfied that we have the best water pipe ever presented to the public. Saratoga Springs, Dec., '49.

G. M. Davidson,	} Water Com.
R. Putnam,	
N. B. Doe,	
R. Gardner,	} Trustees.
H. P. Hyde,	
J. L. Perry,	
J. D. Briggs,	} Late Trustees.
S. Chapman,	
J. A. Corey,	
W. S. Alger,	
Wm. Cook,	

"I certify that I was Chief Engineer, having the construction of the above work in charge, and fully concur in the foregoing statement. Dec., 1849.

"S. R. OSTRANDER, Civil Engineer."

A card, signed by the Trustees or Water Commissioners of Saratoga Spa (village), expressing their unqualified approval of J. Ball & Co's indestructible water pipe, has been shown me; whilst I fully endorse from my own experience, the statements of these gen-

tlemen, I am enabled to add that under my direction, some six thousand feet of cement pipe was laid by Messrs. Ball & Co., in this village, that the main pipe was of 10, 4 and 6 inches bore, and is subjected to a pressure due to an average head of sixty-five feet—it has fully answered my expectations. I would further state that, having been employed by the Common Council of Albany to report a plan of supplying that city with water, I had occasion very carefully to test the merits of this kind of pipe, and was so fully convinced of the practicability of using the cement pipe for large conduits, being of three feet in diameter, as well as for smaller ones, that I recommended its adoption in the proposed work, and give my reasons for so doing.

1st. That the cement pipe is far less expensive than that of cast iron or brick.

2d. That it will sustain an equal pressure with that of cast iron; and when used for large conduits, can be carried up and down the inequalities of the surface of the ground, saving the grading, which is indispensable if a brick one is used.

3d. That it can be readily and economically repaired, and, should it become necessary, can be taken up and relaid without injuring the pipe.

4th. That this description of pipe is not so much affected by frost as one of metal, and in no way impairs the quality of the water.

F. S. CLAXTON,
Engineer and Ag't Cohoes Co.

Messrs. J. Ball & Co., New York.

Cohoes, December 31, 1849.

In addition to the above testimonials, we can state that, having had experience and personal knowledge in regard to the excellent qualities and durability of the above pipe, we have no hesitation in recommending it to the public.

Starr & Alburts, 122 Nassau st.

Frederick Marquand, per H. G. M., Atty.

Janes, Beebe & Co.

H. W. Metcalf, 63 and 65 Centre st.

Norman White, 111 Fulton st.

John J. Merritt, No. 76 Columbia st. Brooklyn.

Platt & Brother, 20 Maiden Lane.

Geo. Griswold, South st.

J. & J. W. Meeks, 14, 16 and 18 Vesey st.

Wm. Gale, 116 Fulton st.

J. C. Brown, Builder, 10 Dutch st.

Wm. Colgate & Co.

Thos. C. Smith.

O. R. Burnham, 17 and 19 Broadway.

G. B. Hartson, 59 and 60 Vesey st.

Wm. W. Campbell, 77 St. Mark's Place.

Lorin Brooks, 240 Broadway.

Messrs. J. Ball & Co.:

Gents: Articles have appeared in the Farmer and Mechanic, from Saratoga and Cohoes, on the subject of your water pipes; I fully endorse their opinions. Your work for my son's water cure at South Orange, embracing a large amount of four and three inch pipe, under a head at least as great as the Croton of New York, shows not only certainty and efficiency, but what is equally important, perfect purity, which for medicine purposes is all important, and should be considered so for drinking and other uses.

Yours, SAML. MEEKER.

Newark, January 11, 1850.

In addition to the above, we certify that J. Ball & Co. have inserted pipes for us of 10 inch bore and less, since the winter of 1844, and that last Spring we had over 1000 lbs. of lead pipe removed, and its place supplied with their pipe. We fully endorse the opinions expressed in the notices above.

BEACH, BROTHERS,

New York Sun Establishment.

Having for the past three years laid many of Messrs J. Ball & Co's patent cement pipes in the Newark Aqueduct Co., I prefer them to any pipe that I have used, their cost being one-third less than iron pipe, and also being free from wear and rust, and can most cordially recommend them for all aqueduct purposes.

SHELDON SMITH, Superintendent.

Newark, January 14, 1850.

THE NEWCASTLE MANUFACTURING CO.
continue to furnish at the Works, situated in the town of Newcastle, Del., Locomotive and other steam engines, Jack Screws, Wrought Iron Work and Brass and Iron Castings, of all kinds connected with Steamboats, Railroads, etc.; Mill Gearing of every description; Cast Wheels (chilled) of any pattern and size, with Axles fitted, also with wrought tires, Springs, Boxes and bolts for Cars; Driving and other wheels for Locomotives.

The works being on an extensive scale, all orders will be executed with promptness and despatch. Communications addressed to Mr. William H. Dobbs, Superintendent, will meet with immediate attention.

ANDREW C. GRAY,
President of the Newcastle Manuf. Co.

LIST NO. 1, [To be Continued.]

Engineering, Railways, Machinery, Steam Engines, etc.

JOHN WILEY, 161 BROADWAY NEW YORK, has on hand and for sale the following Works on the above subjects:

SCOTT, (D.) The Engineer and Machinists' Assistant, being a Series of Plans, Sections and Elevations of Steam Engines, Spinning Machines, Mills for Grinding Tools, etc., taken from Machinists of approved construction at present in operation, 2 volumes folio, one of letter press, the other plates, half bound in Russia, \$18 00.

TREDGOLD, (T.) The Steam Engine, its Invention and Progressive Improvement, an Investigation of its Principles and its Application to Navigation, Manufactures and Railways, a new and revised edition with considerable additions, including enlarged Examples of Locomotive Engines for Railways, Marine Engines for Sea, River and Canal service, with the Construction of Steam Vessels, Stationary Engines employed for all kinds of Manufacturing purposes, Engines employed in Mines for Raising Water, or for supplying Towns with Water, Cornish Pumping Engine, Engines for Mill Work, Flour Mills, etc., High Pressure and Non-condensing Engines, issued Monthly, 15 parts are published at 75 cents each.

BUCHANAN, (R.) Practical Essays on Mill Work and other Machinery, 70 plates, 2 vols \$14 00. Supplement to do., 1 vol., 5 00.

BRIDGES. The Theory, Practice and Architecture of Bridges of Stone, Iron, Timber and Wire, 3 vols. royal, 8mo, half Morocco, 138 Engravings and 92 Wood cuts, \$25 00.

DUGGAN, (G.) Specimens of the Stone, Iron and Wood Bridges, Viaducts, Tunnels, Culverts, etc., of the United States Railroads, part 1 now ready, to be completed in about twelve monthly parts at 75 cents each.

FAIRBAIRN, (W.) The Conway and Britannia Tubular Bridges, together with an Experimental Investigation on Hollow Beams Constructed of Wrought Iron, illustrated with numerous engravings, 1 vol. royal 8vo, \$11 50.

AMERICAN LOCOMOTIVES, being a Treatise on the Theory of Steam, and its Application to Locomotive Engines, illustrated by 42 Elegant and Accurate Engravings of the most approved American Locomotives, and accompanied by full and clear explanations, designed for the use of Students, Builders and Working Engineers, by Emil Renter. The work will be completed in 16 monthly numbers, 5 numbers are now published, at 75 cts. each number. For sale by

JOHN WILEY,
Publisher and Importer,
161 Broadway, New York.

Ballard's Improved JACK-SCREW.

PATENTED.

THE ADVANTAGES OF THIS Screw for Stone Quarries, Railroads, Steam Boiler Builders, and for other purposes are superior to any other similar machine.

The Improvement consists in being able to use either end of the screw, as occasion requires.

It is capable of raising the heaviest Locomotive with ease, being portable, strong and powerful, and not likely to get out of order.

Many Railroad Companies and Boiler Makers have them in use—by whom they are highly recommended.

JACK SCREWS, of various sizes, power and price, constantly on hand at the manufactory.

No. 7 Eldridge Street,
near Division Street.
New York, Jan. 19, 1850.

**To Inventors and Patentees.**

OWEN G. WARREN, ARCHITECT, Has had many years' experience as Agent for obtaining Patents, both in this country and Europe, and will transact such business promptly and reasonably. Persons at a distance can have their business done by correspondence—without the necessity of visiting this city or Washington. Office No. 94 Merchants Exchange, Wall st., corner of Hanover st., up stairs.

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Great Mechanical Work.

SUPPLIED TO SUBSCRIBERS ONLY.
PUBLISHING MONTHLY IN PARTS AT 75cts.

PART I, MEDIUM FOLIO OF SPECIMENS OF THE STONE, IRON, AND WOOD BRIDGES, VIADUCTS, TUNNELS, CULVERTS, &c., of the United States Railroads, illustrated by a Series of Drawings, from actual measurement of the works, including Plans, Elevations, Sections and details of each Structure, accompanied by remarks on the relative merits of the various forms of construction adopted, as regards economy, strength and durability, with Specifications, Estimates, Bills of Timber, Iron, etc., of the several structures: and an APPENDIX, illustrative of the art of Bridge Building as at present practised in Europe; and numerous original Designs for Bridges, Viaducts, Culverts, etc.; the whole calculated to meet the exigencies of Engineers, and assist Draftsmen, Bridge Builders, Mechanics and Students.

BY **GEORGE DUGGAN,**
ARCHITECT AND CIVIL ENGINEER.

New York: D. Appleton & Co.; John Wiley; Geo. P. Putnam; and Stringer & Townsend. Boston: Charles C. Little and James Brown. Albany: Little & Co. Philadelphia: George S. Appleton; Grigg, Elliott & Co., and Thomas Cowperthwait. Buffalo: G. H. Derby & Co. Baltimore: Cushing & Brother. Washington: Frank Taylor. Charleston: McCarter & Allen. Cincinnati: H. W. Derby & Co., and Bradley & Anthony. Richmond: A. Morris. Nashville: W. T. Berry & Co. New Orleans: T. L. White and David Felt & Co. St. Louis: J. Halsall. Natchez: W. H. Fox.

ADDRESS.

The want of a work such as the present is designed to be, has long been felt and regretted by the Engineering profession generally, but more especially by those engaged in Railroad constructions; where the number and variety of bridges are such as to make the mode of construction adopted of especial importance to all parties interested in such undertakings whether the mechanical skill, durability, or economy of these structures is considered. As regards the present undertaking, no pains or expense shall be spared to render it complete and efficient to the fullest extent for the various purposes of the Engineer, practical Bridge Builder, and Mechanical Student.

As an extensive circulation alone can meet the heavy expenses incurred in getting up this work, it is hoped that the members of the Engineering profession generally—for whose advantage it is especially designed—will extend to it the encouragement and support so necessary to its success and completion, in a manner that shall reflect credit on the spirit of enterprise, at present so rife in this great country, and also bear testimony to the mechanical skill and ingenuity of our Engineers.

MODE OF PUBLICATION, TERMS, ETC.

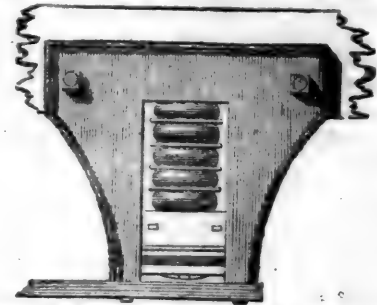
The First or American Division of this important work will be completed in about Twelve Parts, and the APPENDIX in about Eight Parts, each part containing Two double or Four single large folio plates, accompanied by appropriate letter press descriptions, Specifications, Estimates of the cost, Bills of Timber, Iron, &c. of each structure, presenting at a glance the comparative merits, as regards economy, strength, and durability of the various modes of Bridge construction at present practised by the most eminent Engineers in the United States.

The Engraving has been entrusted to first rate artists, and is executing in a manner that cannot fail to give satisfaction, while the price (Seventy-five cents a Month) is such as will place it within the reach of all who take an interest in our great mechanical contrivances.

It shall be optional with Subscribers to take the First Division of the work only, but the APPENDIX cannot be supplied to those who do not subscribe for the First Division.

N. B.—Members of the profession, and others wishing to become subscribers, are requested to send their names without delay to the author, as below, as the publication of the names of Subscribers in one of the early Parts has been determined on, and no more copies of the work will be printed than are found necessary to supply Subscribers. Parties remitting \$9, the cost of First or AMERICAN DIVISION of the work, shall receive it monthly as published, POST FREE, in any part of the United States.

Engineers in charge of Railroad Works, are respectfully requested to send Drawings of their Drawings of Bridges, &c., with the Specifications, Bills of Timber, Iron, &c., to **GEORGE DUGGAN** at his residence No. 179 Henry Street, New York, with a view to their insertion in this work. The Drawings should not, however, exceed 17 x 10, or 21 x 17 inches.

FULLER'S PATENT INDIA RUBBER SPRING.

THESE SPRINGS ARE THE CHEAPEST, the lightest and most durable of any yet known. They are easily applied to new or old cars, and there is small possibility of any accident occurring to them.

Other parties through Mr. Ray set up claims to an India Rubber Spring which, though the same in principle, is very inferior in its working and durability. Actions are in progress for an Infringement on Fuller's Patent against parties using that Spring.

The superiority of Fuller's Spring over that claimed by Mr. Ray is fully established and has frequently been testified to. The following are from gentlemen who have had much experience with both Springs.

"It will afford me pleasure to recommend your springs to the companies in this region, in preference to Ray's which I am confident are inferior in mechanical arrangement to yours."
JOHN M'RAE,
Engineer S. Carolina R. R., Charleston.

"I do not hesitate to allow you to say that I concur in Mr. M' Rae's opinion that Ray's springs are inferior in mechanical arrangement to Fuller's. I repeatedly expressed that opinion long before Mr. M' Rae had seen your springs (as I believe) and entertain it still."
WM. PARKER,
Gen'l Supt. of Baltimore and Ohio R. R.

Office of Sup't Norwich & Worcester R.R. Co.,
December 26, 1849.

"I most fully concur in the opinion of Jno. McRae, Engineer of S. Carolina Railroad, that 'Rays Springs are inferior to Fuller's Springs,' and shall with pleasure recommend them to all Railroad Companies for adoption. I have used both springs on this road and have no hesitation in saying that I should in all cases prefer Fuller's Spring."

SAM'L H. P. LEE, JR.,
Sup't and Engineer.

Office B. & P. R. R. Co.,
Boston, 20th December, 1849.

"This company have cars fitted up with both Ray's and Fuller's 'Metallic India Rubber Springs,' and I do not hesitate to say that Fuller's arrangement is very much superior to Ray's."

W. RAYMOND LEE, Supt.

The following result has been obtained by experiment upon one railroad.

A set of Trucks fitted with Steel Springs cost \$190.77 and weigh 2355 lbs. The same with Fuller's Springs,

	131.71	"	1911 lbs.
Difference,	\$59.06	"	444 lbs.

Not only is there an advantage in the cost, but owing to the great reduction in weight, the car can be made lighter throughout, and so an enormous saving in weight may be effected in a Train.

G. M. KNEVITT, 38 Broadway, N. Y.,
General Agent for the U. S.

The Springs can also be had of
JAMES LEE & CO., 18 India Wharf, Boston, & JAS. THORNLEY, 110 Chestnut St., Philad.
January 2, 1850.

Wanted,

A Second Hand Locomotive, weighing from 10 to 12 tons. It is required that in answer, it will be stated, whether the engine has inside or outside connections—the price of the same delivered at Portland, Maine, and terms of payment expected. Address

VIRGIL D. PANIS,
President Buckfield Branch Railroad,
Portland, Maine.

November 10, 1849.

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The New York Iron Bridge Co.

LATELY KNOWN AS

Rider's Patent Iron Bridge Co.

THE Company which has hitherto furnished these Bridges, under the patent granted to the late Nathaniel Rider, deceased, have become satisfied that all the principles embraced in their construction, are included in a previous patent, granted in the year 1839, to Col. Stephen H. Long, of U. S. Engineers, and by him designated as "Long's Suspension Bridges," and have therefore made an arrangement with Col. Long, by which they have secured the exclusive right to make and vend these Bridges throughout the whole United States.

The only change consequent upon the new arrangement will be found in the name and style of the Company. The parties composing it being the same, the construction of the Bridges will be essentially the same. August 4th, 1849.

M. M. White, Agent,
auctf No. 74 Broadway, New York.

To Contractors.

BLUE RIDGE TUNNEL.—The Contractor for the BLUE RIDGE TUNNEL, having failed to come forward and comply with his engagements, notice is hereby given that PROPOSALS will again be received at the Office of the Board of Public Works, until the 21st of January, 1850, for the construction of the Tunnel and approaches.

The Tunnel will be 4260 feet long, 21 feet high and 16 feet wide, with a ditch on each side; it will pass 700 feet under the top of the Mountain and decline from West to East at the rate of 70 feet to the mile. The approaches will be in the aggregate about 20-0 feet long, and consist of deep cuts, high embankments, some walling and bridging.

Proposers who have not already examined the localities will do well to call at the office of the Engineer, on the spot, where they will obtain all necessary information.

The payments will be cash, with a reservation of 20 per cent till the entire completion of the work; besides which, the contractor is required by law to give bond, with satisfactory bond and security in Virginia. The amount of the bond required will be thirty thousand dollars.

The best testimonials and an energetic prosecution of the work are expected: the contract and bond to be executed within ten days after the letting, and the work to begin *bona fide* within sixty days after the same period.

C. CROZET,
Engineer Blue Ridge Railroad.

Terms of proposals and specifications may be obtained at both offices.

NOTICE TO Superintendents of Railroads.

TYLER'S PATENT SAFETY SWITCH.—The undersigned would respectfully call their attention to his Patent Safety Switch, which from long trial and late severe tests has proved itself perfectly reliable for the purpose for which it was intended. It is designed to prevent the train from running off when the switch is set to the wrong track by design or accident. The single rail or gate switch is established as the best and safest switch for the ordinary purpose of shifting cars from one track to another, but it is liable to the serious evil of having one track open or broken when connected with the other. My improvement entirely removes this evil, and while it accomplishes this important office, leaves the switch in its original simplicity and perfection of a plain unbroken rail, connecting one track with the other ready for use.

The following decision of the Commissioner of Patents is respectfully submitted to Railroad Engineers, Superintendents, and all others interested in the subject.

P. B. TYLER.

(COPY.)

UNITED STATES PATENT OFFICE,
Washington City, D.C., April 28th, 1846.

Sir: You are hereby informed that in the case of the interference between your claims and those of Gustavus A. Nicolls, for improvements in safety switches—upon which a hearing was appointed to take place on the 3d Monday in March, 1846, the question of priority of invention has been decided in your favor. Inclosed is a copy of the decision. The testimony in the case is now open to the inspection of those concerned.

Yours respectfully,
EDMUND BURKE,
Commissioner of Patents.

To Philo B. Tyler.

Any further information may be obtained by addressing P. B. TYLER, Springfield, Mass., or JOHN PENDLETON, Agent, 149 Hudson St., New York.

To Railroad Companies and Contractors.

FOR SALE.—Two Locomotive Engines and Tenders, at present in use on the Beaver Meadow Railroad, being too light for their coal trains, but well calculated for either gravel or light passenger trains.

They weigh, in running order, about 8 tons each—having one pair of driving wheels 4 feet diameter, 4 truck wheels 30 inches diameter, with cylinders 10 in. diameter, and 18 inches stroke of piston. Tenders on 4 wheels. Address JAMES ROWLAND,

Pres't. Beaver Meadow Railroad & Coal Co.,
Philadelphia.

or, L. CHAMBERLAIN, Sec'y,
at Beaver Meadow, Pa.

May 19, 1849.

20tf

ENGINEERS.**Arrowsmith, A. T.,**

Buckfield Branch Railroad, Buckfield, Me.

Banks, C. W.,

Civil Engineer, Vicksburg, Miss.

Berrien, John M.,

Michigan Central Railroad, Marshall, Mich.

Buckland, George,

Troy and Greenbush Railroad.

Clement, Wm. H.,

Little Miami Railroad, Cincinnati, Ohio.

Cozzens, W. H.,

Engineer and Surveyor, St. Louis, Mo.

Davidson, M. O.,

Eckhart Mines, Alleghany Co., Maryland.

Fisk, Charles B.,

Cumberland and Ohio Canal, Washington, D. C.

Felton, S. M.,

Fitchburg Railroad, Boston, Mass.

Floyd-Jones, Charles,

South Oyster Bay, L. I.

Gzowski, Mr.,

St. Lawrence & Atlantic Railroad, Montreal, Canada.

Gilbert, Wm. B.,

Rutland and Burlington Railroad, Rutland, Vt.

Grant, James H.,

Nashville and Chattanooga R. R., Nashville, Tenn.

Harry, P.,

Binghamton, New York.

Holcomb, F. P.,

Southwestern Railroad, Macon, Ga.

Higgins, B.,

Mansfield and Sandusky Railroad, Sandusky City, O.

Johnson, Edwin F.,

New York and Boston Railroad, Middletown Ct.

Latrobe, B. H.,

Baltimore and Ohio Railroad, Baltimore, Md.

Sours, Peter,

Dauphin und Susquehanna Coal Co., Dauphin, Pa.

Miller, J. F.,

Worcester and Nashua Railroad, Worcester, Mass.

Morris, Elwood,

Schuylkill Navigation, Schuylkill Haven, Pa.

Morton, A. C.,

Atlantic and St. Lawrence Railroad, Portland, Me.

McRae, John,

South Carolina Railroad, Charleston, S. C.

Nott, Samuel,

Lawrence and Manchester Railroad, Boston,

Prichard, M. B.,

East Tennessee and Georgia R. R., Cleveland, Tenn.

Reynolds, L. O.,

Central Railroad, Savannah, Ga.

Roebbling, John A.,

Trenton, N. J.

Roberts, Solomon W.,

Ohio and Pennsylvania Railroad, Pittsburg, Pa.

Robinson, James P.,

Androscoggin & Kennebec Railroad, Waterville, Me.

Schlatter, Charles L.,

Northern Railroad (Ogdensburg), Malone, N. Y.

Stark, George.,

Bost., Con. and Mont. R. R., Meredith Bridge, N. H.

Steele, J. Dutton,

Pottstown, Pa.

Trimble, Isaac R.,

Philad., Wil. & Baltimore Railroad, Wilmington, Del.

Tinkham, A. W.,

United States Fort, Bucksport, Me.

Thomson, J. Edgar.,

Pennsylvania (Central) Railroad, Philadelphia.

Whipple, S.,

Civil Engineer and Bridge Builder, Utica, N. Y.

Williams, E. P.,

Auburn and Schenectady Railroad, Auburn, N. Y.

Williams, Charles H.,

Milwaukee, Wisconsin.

Wormeley, Preble,

Central Ohio Railroad, Zanesville, Ohio.

BUSINESS CARDS.

Cumberland, (Md.) Coals for Steaming, etc.

ORDERS RECEIVED FOR AND FILLED
by J. COWLES, 37 Wall St., N. Y.

George O. Robertson,

Broker in Scotch and American Pig Iron; Bar Iron,

Lead, Spelter, Tin, Copper, etc.,

NO. 4 LIBERTY PLACE, MAIDEN LANE,

(Near Broadway.)

NEW YORK

DUNLAP'S HOTEL,

On the European Plan,

NO. 135 FULTON STREET,

Between Broadway and Nassau St.,

NEW YORK.

Manufacture of Patent Wire ROPE AND CABLES,

For Inclined Planes, Suspension Bridges, Standing

Rigging, Mines, Cranes, Derrick, Tilters, &c., by

JOHN A. ROEBLING, Civil Engineer,

TRENTON, N. J.

Samuel D. Willmott,

MERCHANT, AND MANUFACTURER OF

CAST STEEL WARRANTED SAWS,

IMPORTER OF THE

GENUINE WICKESRLY GRINDSTONES,

NO. 8 LIBERTY STREET,

NEW YORK.

Doremus & Harris,

ANALYTICAL & CONSULTING CHEMISTS,

179 BROADWAY, NEW YORK.

SCHOOL OF CHEMISTRY.**Dudley B. Fuller & Co.,**

IRON COMMISSION MERCHANTS,

No. 139 GREENWICH STREET,

NEW YORK.

Manning & Lee,

GENERAL COMMISSION MERCHANTS,

NO. 51 EXCHANGE PLACE,

BALTIMORE.

Agents for Avalon Railroad Iron and Nail Works,
Maryland Mining Company's Cumberland Coal 'CED'
—'Potomac' and other good brands of Pig Iron.

**Railroad Car Manufacturer's
Furnishing Store.****[F. S. & S. A. MARTINE,**

IMPORTERS AND MANUFACTURERS OF

**RAIL ROAD CAR &
CARRIAGE LININGS,
PLUSHES, CURTAIN MATERIALS, ETC.,
113 WILLIAM ST., NEAR JOHN.**3-4 and 6-4 Damasks, Union and Worsted; Mo-
reens, Rattinets, Cloths, Silk and Cotton Velvets,
English Buntings**Walter R. Johnson,****CIVIL AND MINING ENGINEER AND AT-
torney for Patents. Office and Laboratory, F St.,
opposite the Patent office, Washington, D. C.****S. W. Hill,**Mining Engineer and Surveyor, Eagle River,
Lake Superior.**Starks & Pruyn,****MANUFACTURERS OF ALL KINDS OF
STEAM BOILERS,**

52 and 54 Liberty, corner of Pruyn street

Nathan Starks, **ALBANY** Special Partner
Wm. F. Pruyn, R. H. Pruyn.
Iron Railing, Bank and Vault Doors, Iron Shutters
Bridge and Roof Bolts, Heavy Jobbing and Forging
of all kinds.

For particulars see Adv. in another column.

To Engineers and Surveyors.E. BROWN AND SON Mathematical inst. ma-
kers No. 27 Fulton Slip, New York, make and keep
for sale, Theodolites, Levelling inst., Levelling rods,
Surveyors Compasses, and Chains, Cases of Mathe-
matical drawing insts. various qualities, together with
a general assortment of Ivory Scales and small insts.
generally used by Engineers.**Samuel Kinter & Co.,
COMMISSION MERCHANTS**

WILLOW ST. WHARVES, PHILADELPHIA.

AGENTS for the sale of Charcoal and Anthracite
A Pig Iron, Hammered Railroad Car and Locomo-
tive Axles, Force Pumps of the most approved con-
struction for Railroad Water Stations and Hydraulic
Rams, etc., etc.
July, 27, 1849.**James Herron, Civil Engineer,**OF THE UNITED STATES NAVY YARD,
PENSACOLA, FLORIDA.,

PATENTEE OF THE

HERRON RAILWAY TRACK.Models of this Track, on the most improved plans,
may be seen at the Engineer's office of the New York
and Erie Railroad.**To Railroad Companies.****—WROUGHT IRON WHEELS—
SAFETY AND ECONOMY.****NORRIS' LOCOMOTIVE WORKS,
SCHENECTADY, NEW YORK,**Are Manufacturing Wrought Iron Driving, Truck,
Tender, and Car Wheels—made from the best Ameri-
can Iron. Address E. S. NORRIS.
May 16, 1849.**Machinery Warehouse.**S. C. HILLS, No. 43 Fulton street, New York, has
constantly for sale Steam Engines, Boilers, Lathes,
Chucks, Drills, Planers, Force and Suction Pumps;
Tenoning, Morticing and Boring Machines, Shingle
Machines, Bolt and Nut Machines, Belting, Oil, Iron
and Lead Pipe; Rubber, Percha and Leather Hose,
&c., &c.S. C. H.'s arrangements with several machine shops
are such that he can supply, at very short notice, large
quantities of machinery.
November 23, 1849.**Cruse & Burke,****Civil Engineers, Architects and Surveyors,
Office, New York State Institution of Civil Engineers,
STATE HALL, ALBANY., N. Y.**Drawings, specifications and surveys accurately ex-
ecuted. Pupils instructed theoretically and practical-
ly at a moderate premium.
May 26, 1849.**Eaton, Gilbert & Co.,**Railroad Car, Coach and Omnibus Builders,
TROY, N. Y.**Hudson River Foundry,
THOMAS & COLLINS,**

130 Quay Street, Albany.

To Railroad & Navigation Cos.Mr. M. BUTT HEWSON, *Civil Engineer*, offers his
services to Companies about to carry out the surveys
or works of a line of Navigation or Railroad. He can
give satisfactory references in New York City as to his
professional qualifications; and will therefore merely
refer here to the fact of his having been engaged for
upwards of two years conducting important Public
Works for the British Government.Communications will find Mr. Hewson at the office
of the Railroad Journal, 54 Wall Street, New York.**Alfred W. Craven,**

Chief Engineer Croton Aqueduct, New York.

Cop Waste.**CLEAN COP WASTE**, suitable for cleaning Rail-
road, Steam and Stationary Engines, constan-
tly on hand and for sale by**KENNEDY & GELSTON,**
54 Pine St., New York.

October 27, 1849,

3m

IRON.**Iron.**Pig Iron, Anthracite and Charcoal; Boiler and Flue
Iron, Spring and Blistered Steel, Nail Rods, Best Re-
fined Bar Iron, Railroad Iron, Car Axles, Nails, Stove
Castings, Cast Iron Pipes of all sizes, Railway Chairs
of approved patterns for sale by**COLEMAN, KELTON & CAMBELL,**
109 N. Water St., Philadelphia.**IRONDALE PIG METAL, MANUFACTURED**and for sale by the Bloomsburg Railroad Iron Co.
DUDLEY FISHER, Treasurer.
75 N. Water St., Philadelphia.**Railroad Iron.****500** Tons, afloat, weighing 57 pounds per lineal
yard, for sale by**COLLINS, VOSE & CO.,**
158 South St.

New York, November 17, 1849.

Railroad Iron.**THE** Undersigned, Agents for Manufacturers, are
prepared to contract to deliver Rails of superior
quality, and of any size or pattern, to any ports of dis-
charge in the United States.**COLLINS, VOSE & CO.,**
158 South St.

New York, November 17, 1849.

Railroad Iron.1600 Tons, weighing 60½ lbs. per yard.
185 " " 57½ " "
530 " " 53 " "

of the latest and most approved patterns. For sale by

BOORMAN, JOHNSTON & CO.,
119 Greenwich street.

New York, Oct. 13, 1849.

Railroad Iron.**THE** Undersigned have on hand, ready for immedi-
ate delivery, various patterns of Iron Rails, of
best English make, and manufactured in conformity
with special specifications.
They offer also to import and contract to deliver
ahead—on favorable terms.**DAVIS, BROOKS, & CO.,**
68 Broad street.

New York, Oct. 11, 1849.

Drawings and Patterns of the most approved
Rail—and specifications of quality and make of same,
are on hand at their office, for examination of parties
who may desire to inspect the same. D., B. & Co.
Oct. 11, 1849.**CUT NAILS OF BEST QUALITY, BAR IRON**(including Flat Rails) manufactured and for sale
by **FISHER, MORGAN & CO.,**
75 N. Water St., Philadelphia.**Glendon Refined Iron.**Round Iron, Band Iron, Hoop Iron,
Square " Flat " Scroll "Axles, Locomotive Tyres,
Manufactured at the Glendon Mills, East Boston, for
sale by **GEORGE GARDNER & CO.,**
5 Liberty Square, Boston, Mass.
Sept. 15, 1849. 3m37**PATENT HAMMERED RAILROAD, SHIP &
BOAT SPIKES.**—The Albany Iron Works
have always on hand, of their own manufacture, a
large assortment of Railroad, Ship and Boat Spikes
from 2 to 12 inches in length, and of any form of head.
From the excellence of the material always used in
their manufacture, and their very general use for rail-
roads and other purposes in this country, the manu-
facturers have no hesitation in warranting them fully
equal to the best spikes in market, both as to quality
and appearance. All orders addressed to the subscrib-
ers at the works will be promptly executed.**JOHN F. WINSLOW, Agent.**Albany Iron and Nail Works, Troy, N. Y.
The above Spikes may be had at fact prices, of
Erastus Corning & Co. Albany; Menitt & Co., New
York; E. Pratt & B. 100 E. 2nd St. Md**LAP—WELDED
WROUGHT IRON TUBES**

FOR

TUBULAR BOILERS,

FROM 1 1-2 TO 8 INCHES DIAMETER.

These are the ONLY Tubes of the same quality
and manufacture as those so extensively used in
England, Scotland, France and Germany, for Lo-
comotive, Marine and other Steam Engine Boilers**THOMAS PROSSER,**

Patentee.

28 Platt street, New York.

Railroad Iron.**THE** UNDERSIGNED ARE PREPARED TO
contract for the delivery of English Railroad Iron
of favorite brands, during the Spring. They also re-
ceive orders for the importation of Pig, Bar, Sheet, etc.
Iron.**THOMAS B. SANDS & CO.,**22 South William street,
New York.

February 3, 1849.

Iron Store.**THE** Subscribers, having the selling agency of the
following named Rolling Mills, viz: Norristown,
Rough and Ready, Kensington, Philadelphia, Potts-
grove and Thorndale, can supply Railroad Companies,
Merchants and others, at the wholesale mill prices for
bars of all sizes, sheets cut to order as large as 58 in.
diameter; Railroad Iron, domestic and foreign; Loco-
motive tire welded to given size; Chains and Spikes;
Iron for shafting, locomotive and general machinery
purposes; Cast, Shear, Blister and Spring Steel; Bol-
der rivets; Copper; Pig iron, etc., etc.**MORRIS, JONES & CO.,**

Iron Merchants,

Schuylkill 7th and Market Sts., Philadelphia.
August 16, 1849. 1y33**Railroad Iron.****THE** MOUNT SAVAGE IRON WORKS, AL-
legany county, Maryland, having recently pass-
ed into the hands of new proprietors, are now prepar-
ed, with increased facilities, to execute orders for any
of the various patterns of Railroad Iron. Communi-
cations addressed to either of the subscribers will have
prompt attention. **J. F. WINSLOW, President**

Troy, N. Y.

ERASTUS CORNING, Albany.**WARREN DELANO, Jr., N. Y.****JOHN M. FORBES, Boston.****ENOCH PRATT, Baltimore, Md.**

November 6, 1848.

Railroad Iron.**THE** SUBSCRIBERS ARE PREPARED TO
take orders for Railroad Iron to be made at their
Phoenix Iron Works, situated on the Schuylkill Riv-
er, near this city, and at their Safe Harbor Iron Works,
situated in Lancaster County, on the Susquehanna
river; which two establishments are now turning out
upwards of 1800 tons of finished rails per month.
Companies desirous of contracting will be promptly
supplied with rails of any required pattern, and of the
very best quality.**REEVES, BUCK & CO.,**

45 North Water St., Philadelphia.

March 15, 1849.

Monument Foundry.

A. & W. DENMEAD & SON,
Corner of North and Monument Sts.,—Baltimore,
HAVING THEIR

IRON FOUNDRY AND MACHINE SHOP

In complete operation, are prepared to execute faithfully and promptly, orders for Locomotive or Stationary Steam Engines, Woolen, Cotton, Flour, Rice, Sugar Grist, or Saw Mills, Slide, Hand or Chuck Lathes, Machinery for cutting all kinds of Gearing, Hydraulic, Tobacco and other Presses, Car and Locomotive patent Ring Wheels, warranted, Bridge and Mill Castings of every description, Gas and Water Pipes of all sizes, warranted, Railroad Wheels with best faggotted axle, furnished and fitted up for use, complete

Being provided with Heavy Lathes for Boring and Turning Screws, Cylinders, etc., we can furnish them of any pitch, length or pattern.

Old Machinery Renewed or Repaired—and Estimates for Work in any part of the United States furnished at short notice.

June 8, 1849.

Iron Wire.

REFINED IRON WIRE OF ALL KINDS,
Card, Reed, Cotton-flyer, Annealed, Broom, Buckle, and Spring Wire. Also all kinds of Round, Flat or Oval Wire, best adapted to various machine purposes, annealed and tempered, straightened and cut any length, manufactured and sold by

ICHABOD WASHBURN.

Worcester, Mass., May 25, 1849.

American and Foreign Iron.**FOR SALE,**

300 Tons A 1, Iron Dale Foundry Iron.

100	"	1,	"	"	"
100	"	2,	"	"	"
100	"	"	"	"	"
100	"	"	"	Forge	"
400	"	"	"	Wilkesbarre	"
100	"	"	"	"	"
100	"	"	"	"	"
300	"	"	"	"	"
50	"	"	"	"	"
250	"	"	"	"	"
50	"	"	"	"	"
75	"	"	"	"	"
30	"	"	"	"	"
50	"	"	"	"	"
50	"	"	"	"	"
50	"	"	"	"	"
50	"	"	"	"	"
50	"	"	"	"	"

Locomotive and other boiler iron furnished to order.

GOODHUE & CO.,

New York. 64 South street

American Pig, Bloom and Boiler Iron.

HENRY THOMPSON & SON,
No 57 South Gay St., Baltimore, Md.,
Offer for sale, *Hot Blast Charcoal Pig Iron* made at the *Catoctin* (Maryland), and *Taylor* (Virginia), *Furnaces*; *Cold Blast Charcoal Pig Iron* from the *Cloverdale* and *Catawba*, Va., *Furnaces*, suitable for *Wheels* or *Machinery* requiring extra strength; also *Boiler and Flue Iron* from the mills of *Edge & Hilles* in Delaware, and best quality *Boiler Blooms* made from *Cold Blast Pig Iron* at the *Shenandoah Works*, Va. The productions of the above establishments can always be had at the lowest market prices for approved paper.

American Pig Iron of other brands, and *Rolled and Hammered Bar Iron* furnished at lowest prices. Agents for *Watson's Perth Amboy Fire Bricks*, and *Rich & Cos. New York Salamander Iron Chests*.
Baltimore, June 14, 1849. 6 mos

LAP-WELDED WROUGHT IRON TUBES
for Tubular Boilers, from 1½ to 15 inches diameter, and any length not exceeding 17 feet—manufactured by the *Caledonian Tube Company*, Glasgow, and for sale by
IRVING VAN WART,
12 Platt street, New York.

JOB CUTLER, Patentee.

These Tubes are extensively used by the British Government, and by the principal Engineers and Steam Marine and Railway Companies in the Kingdom.

Railroad Iron.

THE TRENTON IRON COMPANY ARE NOW
turning out one thousand tons of rails per month, at their works at Trenton, N. J. They are prepared to enter into contract to furnish rails of any pattern, and of the very best quality, made exclusively from the famous *Andover Iron*. The position of the works on the Delaware river, the Delaware and Raritan canal, and the Camden and Amboy railroad, enables them to ship rails at all seasons of the year. Apply to
COOPER & HEWITT, Agents.

October 30, 1848. 17 Burling Slip, New York.

Pig and Bloom Iron.

THE SUBSCRIBERS ARE AGENTS for the sale of numerous brands of Charcoal and Anthracite Pig Iron, suitable for Machinery, Railroad Wheels, Chains, Hollowware, etc. Also several brands of the best Puddling Iron, Juniata Blooms suitable for Wire, Boiler Plate, Axe Iron, Shovels, etc. The attention of those engaged in the manufacture of Iron is solicited by
A. WRIGHT & NEPHEW,
Vine Street Wharf, Philadelphia.

Iron.

THE SUBSCRIBERS HAVING resumed the agency of the New-Jersey Iron Company, are prepared to execute orders for the different kinds and sizes of Iron usually made at the works of the company, and offer for sale on advantageous terms.—

150 tons	No. 1	Buonton Foundry Pig Iron.
100	"	No. 2 do. do. do.
300	"	Nos. 2 & 3 Forge do. do.
100	"	No. 2 Glendon do. do.
140	"	Nos. 2 & 3 Lehigh Crane do do.
100	"	No. 1 Pointon Charcoal do.
100	"	New-Jersey Blooms
50	"	New-Jersey Faggoting Iron, for shafts
		Best Bars, ½ to 4 inch by ½ to 1 inch thick.
		Do do Rounds and Squares, ½ to 3 inch.
		Rounds and Squares, 3-16 to 1 inch.
		Half Rounds, ½ to 1 in. Ovals & Half Ovals ½ to 1½ in.
		Bands, 1½ to 4 inch. Hoops, ½ to 2 inch.
		Trunk Hoops, ½ to 1½ in. Horse Shoe & Nut Iron.
		Nail Plates. Railroad Spikes.

DUDLEY B. FULLER & Co., 139 Greenwich-st. and 85 Broad-st.

WILLIAM JESSOP & SONS' CELEBRATED CAST-STEEL.

The subscribers have on hand, and are constantly receiving from their manufactory,

PARK WORKS, SHEFFIELD,
Double Refined Cast Steel—square, flat and octagon. Best warranted Cast Steel—square, flat and octagon. Best double and single Shear Steel—warranted. Machinery Steel—round.

Best and 2d gy. Sheet Steel—for saws and other purposes. German Steel—flat and square, "W. I. & S." "Eagle" and "Goat" stamps.

Genuine "Sykes," L Blister Steel. Best English Blister Steel, etc., etc., etc.

All of which are offered for sale on the most favorable terms by
WM. JESSOP & SONS,
91 John street, New York.

Also by their Agents—
Curtis & Hand, 47 Commerce street, Philadelphia.
Alex'r Fullerton & Co., 119 Milk street, Boston.

Stickney & Beatty, South Charles street, Baltimore.
May 6, 1848.

SPRING STEEL FOR LOCOMOTIVES, TENDERS AND CARS.—The subscriber is engaged in manufacturing spring steel from 1½ to 6 inches in width, and of any thickness required: large quantities are yearly furnished for railroad purposes, and wherever used its quality has been approved of. The establishment being large, can execute orders with great promptitude, at reasonable prices, and the quality warranted. Address
J. F. WINSLOW, Agent,
Albany Iron and Nail Works.

JOHNSON, CAMMELL & Co's Celebrated Cast Steel,

AND ENGINEERING AND MACHINE FILES,
which for quality and adaptation to mechanical uses, have been proved superior to any in the United States. Every description of square, octagon, flat and round cast steel, sheet, shovel and railway spring steel, best double and single shear steel, German steel, flat and square, goat stamps, etc. Saw and file steel, and steel to order for any purposes, manufactured at their *Cyclops Steel Works* Sheffield.

JOHNSON, CAMMELL & CO.,
100 William St., New York.

November 23 1849.

American Cast Steel.

THE ADIRONDAC STEEL MANUFACTURING CO. is now producing, from American iron, at their works at Jersey City, N. J., Cast Steel of extraordinary quality, and is prepared to supply orders for the same at prices below that of the imported article of like quality. Consumers will find it to their interest to give this a trial. Orders for all sizes of hammered cast steel, directed as above, will meet with prompt attention.
May 28, 1849.

To Steam Engine Builders.

THE Undersigned offer for sale, at less than half its cost, the following new machinery, calculated for an engine of 62 inches cylinder and 10 feet stroke, viz:

- 2 Wrought Iron Cranks, 60 inches from centre to centre.
- 1 Do. do. Connecting Rod Strap.
- 2 Do. do. Crank Pins.
- 1 Eccentric Strap.
- 1 Diagonal Link with Brasses.
- 1 Cast Iron Lever Beam (forked).

The above machinery was made at the West Point Foundry for the U. S. Steamer Missouri, without regard to expense, is all finished complete for putting together, and has never been used. Drawings of the cranks can be seen on application to

HENRY THOMPSON & SON,
No. 67 South Gay St., Baltimore, Md.
Sept. 12, 1849.

Railroad Instruments.

THEODOLITES, TRANSIT COMPASSES,
and Levels, with Franckhoffs Munich Glasses, Surveyor's Compasses, Chains, Drawing Instruments, Barometers, etc., all of the best quality and workmanship, for sale at unusually low prices, by
E. & G. W. BLUNT,
No. 179 Water St., cor. Burling Slip.

New York, May 19, 1849.

Mattewan Machine Works.

THE Mattewan Company have added to their Machine Works an extensive LOCOMOTIVE ENGINE department, and are prepared to execute orders for Locomotive Engines of every size and pattern—also Tenders, Wheels, Axles, and other railroad machinery, to which they ask the attention of those who wish such articles, before they purchase elsewhere.

STATIONARY ENGINES, BOILERS, ETC.,
Of any required size or pattern, arranged for driving Cotton, Woollen, or other Mills, can be had on favorable terms, and at short notice.

COTTON AND WOOLLEN MACHINERY,
Of every description, embodying all the modern improvements, second in quality to none in this or any other country, made to order.

MILL GEARING,

Of every description, may be had at short notice, as this company has probably the most extensive assortment of patterns in this line, in any section of the country, and are constantly adding to them.

TOOLS.

Turning Lathes, Slabbing, Planing, Cutting and Drilling Machines, of the most approved patterns, together with all other tools required in machine shops, may be had at the *Mattewan Company's* Shops, Fish-kill Landing, or at 39 Pine street, New York.

WM. B. LEONARD, Agent.

NOTICE.

TO BRIDGE BUILDERS, BRIDGE COMPANIES, and Other Individuals and Associations, who have constructed or used Bridges involving the combined principle of *Bracing, Counter-bracing and Trussing* by means of counteracting braces, keys, wedges, screws, etc., as set forth and explained in my Bridge Patent of 1830, in the words following, to wit: "A system of Counter-bracing, by means of which the truss frames are rendered stiff and unyielding, and the bridge kept in uniform action whether loaded or unloaded"—NOTICE is hereby given, that in all cases in which said combined principle has been introduced into bridges, without due license or authority from me, and without my having been duly remunerated therefor, will be regarded as infringements upon my rights and privileges, and that an amicable adjustment and settlement of all my claims in the premises may be effected by prompt application to my duly authorized Agents therefor, viz: Messrs. Clinton, Knight and Brother, of Cincinnati, Ohio, or Daniel A. Webster, Esq., 8 Pell street of the city of New York.

STEPHEN H. LONG, Patentee.
Louisville, December 10, 1849.

To Railroad Companies.

FOR SALE—A Second-hand Locomotive Engine and Tender, of about 10 tons weight, in good order, and warranted to perform well. Any company wanting a cheap engine for a passenger or light burden train, will rarely meet with an opportunity so favorable as the present. The engine and tender are in perfect running order, and will be tested to the satisfaction of any one wishing to purchase. Price \$1,500.

Address **J. B. MOORHEAD,**
Frazer P.O., Chester county, Pa.

P.S.—The Engine can be seen by calling on H. Omond & Co., Car-builders, Broad st., Philadelphia.
September 6, 1849.

India-rubber for Railroad Cos.

RUBBER SPRINGS—Bearing and Buffer—Fuller's Patent—Hose from 1 to 12 inches diameter. Suction Hose. Steam Packing—from 1-16 to 2 in. thick. Rubber and Gutta Percha Bands. These articles are all warranted to give satisfaction, made under Tyer & Helm's patent, issued January, 1849.—No lead used in the composition. Will stand much higher heat than that called "Goodyear's," and is in all respects better than any in use. Proprietors of railroads do not be overcharged by pretenders.

HORACE H. DAY,
Warehouse 23 Courtlandt street.
New York, May 21, 1849.

Fire Brick.

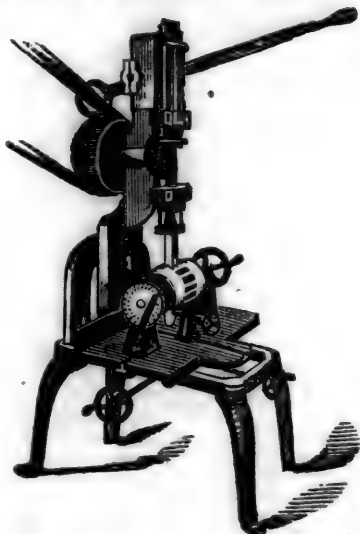
THE Subscribers have constantly on hand Rafford's Stourbridge, Oak Farms Stourbridge, Lister, Wortley, Red and White Welsh Fire Bricks, common and fancy shapes. Also,

ROOFING SLATES,
from the best Welch quarries, and of all sizes. Also,
COAL,

of all kinds—Liverpool Orrell and Cannel, Scotch, New Castle, Pictou, Sidney, Cumberland, Virginia, and all kinds of Anthracite coals. Also,
Pig Iron, Salt, etc., etc., for sale at the lowest market price. Apply to

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November, 23, 1849.

**Capt. Alfred Swingle's
PATENT BORING
& MORTISING MACHINE.**



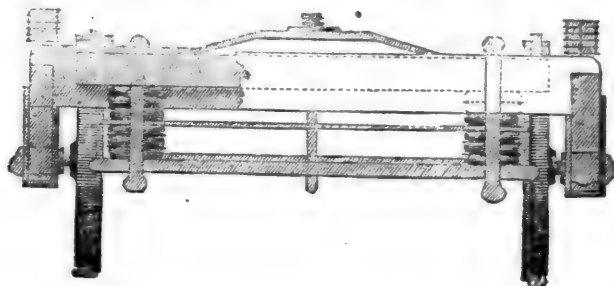
The above Machine was invented by A. SWINGLE, of Texas, in 1846, and Letters Patent were taken out in July, 1848. As a labor saving Machine it stands unrivalled even in these days of improvements. Its uses are innumerable; it may be successfully applied to Doors, Sashes, Carriages, Wheel-Hubs, and in fact to all kinds of work where the Auger and Chisel can be brought to bear.

The only limit to the speed of the working of this machine is the heating of the tools used. It will perform at least the labor of twelve men, and in vastly better manner, and can be worked equally well by steam power or by hand. It has been used and has given universal satisfaction.

For further information apply to **H. B. TEBBETTS,**
40 Wall St., New York, to whom all orders are to be addressed.

New York, December 15, 1849.

**FULLER'S PATENT
INDIA RUBBER CAR SPRINGS.**



RAILROAD COMPANIES are cautioned, before purchasing Springs, to examine the actual patents and judge for themselves.

Persons, under the Title of the New England Car Company, seeking fraudulently to invade Fuller's rights have put forth so many statements for the purpose of misleading the public, that an enumeration of some facts is absolutely necessary, for the purpose of putting persons interested upon their guard.

Fuller's patent is for the application of Discs of India-rubber with Metal Plates, for forming Springs for Railway Cars and Carriages—either one disc and two plates, or ten discs and plates, or any other number, are equally covered by the patent. Fuller is not bound to the use of short discs—he may use long discs and plates.

Ray's patent is simply and wholly the forming of air-tight rubber cylinders, with hoops or bands round the outside, and the combination of elasticity of India rubber, with the elasticity of atmospheric air confined in the cylinder, and in no part of his patent is he authorized to use the form of spring which he is now fraudulently supplying to Railroad Companies. Such springs are direct and positive infringements of the very letter of Fuller's patent.

Fuller's patent is dated October, 1845, Ray's patent, August, 1848.

The spring patented by Ray never has been put in operation, and never can be made useful for Railroad cars.

A mere experiment, even if made, it is well known does not prove an invention; and it is ridiculous for such parties to hope to mislead the Presidents and Superintendents of Railroad companies, by claiming the invention because Ray alleges he made an experiment—which Fuller had made before him—had actually brought into working order, and obtained a patent for—and this too before Mr. Ray states he made his experiment—and that experiment not claimed to have been applied to a car or carriage.

Besides, the invention could not have been developed until India rubber, properly Vulcanised, could be made of a sufficient thickness. In the United States the art of vulcanising rubber by steam heat, (by which

means only can a body of rubber having any considerable thickness be vulcanised,) was not introduced until after the grant by the American government of the patent for springs to Fuller—whereas the process of vulcanising rubber by steam heat was invented in England about three years previously, and was used by Fuller there. This fact refutes entirely the claim of invention put forth by Mr. Ray, and proves the impossibility of his pretensions being true.

Fuller was the first and only inventor of the spring. A Mr. Dorr, whose connection with Mr. Goodyear is well known in this country, applied in England to Mr. Fuller, after he had published and patented his invention, and introduced another party for the purpose of obtaining the agency for the United States. They were furnished with a complete set of drawings and models, and with instructions to make arrangements for the supply of material of American manufacture—from that hour to the present not a single communication has been received from them. Some of these identical models have been traced into the hands of parties now seeking to invade Fuller's rights, and who have exhibited them as specimens of their own invention.

After this, the conveyance was made by Goodyear to certain parties here for the use for railroad springs of what he calls his Metallic rubber. Comment is unnecessary.

There are 5 or 6 different processes for the manufacture of vulcanised rubber, patented by as many different parties, some here, some in England, either of which would probably make good springs.

A large and powerful company has been organized under Fuller's patent, the particulars of which shall be given very shortly.

An action has been commenced against three railroad companies for infringement; and all other parties will assuredly be prosecuted if they continue farther to infringe upon Fuller's patent.

W. C. FULLER,

The only persons authorised to supply the Springs are **G. M. KNEVITT**, 38 Broadway, N. York,
General Agent for the U. S.; and
JAS. LEE & Co., 18 India Wharf, Boston.
JOHN THORNLEY, Chestnut st., Philad.

**Arch St. Machine Shop.
BIRKENBINE, MARTIN & TROTTER,**

Makers of
STEAM ENGINES,

and
HYDRAULIC MACHINERY,
NO. 16 ARCH STREET,
PHILADELPHIA,

Will construct Steam Engines, Pumps, for Draining Mines and Land; supplying Water to Towns, Factories, Farms, etc;

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B., M. & T. contract for, Warming and Ventilating Buildings by Steam or Warm Water.

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New Castle	{	Grindstones, of all sizes and grits.
Nova Scotia		
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American and	{	Burr Blocks, Bolting Cloths, Mill Irons, etc.
Patent compressed		
Garnkirk		

**To the Proprietors of Rolling
Mills and Iron Works.**

THE Undersigned—Proprietors of Townsend's Furnace and Machine Shop, Albany—are extensively engaged in the manufacture of Machinery and fixtures for Iron, and Copper Rolling Mills, and Iron Works. Having paid particular attention to the manufacture of *Rolls* (Rollers), both *chilled* and *dry-sand*, they feel confident that they can execute orders for such castings in a satisfactory manner. And to give assurance of this, they beg leave to refer to the following named persons, proprietors and managers of some of the most extensive rolling mills in the country, viz: Jno. F. Winslow, J. Tuckerman, H. Burden, W. Burt, J. & J. Rogers, Saltus & Co., J. B. Bailey, L. G. B. Cannon, Hawkins & Atwater, etc., etc.

F. & T. TOWNSEND.

Albany, August 18, 1849.

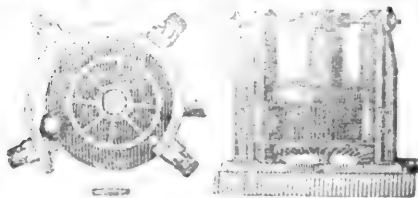
Steam Boiler Explosions.

THE Subscriber having been appointed sole Agent for Faber's Magnetic Water Gauge, is now ready to supply the trade, and also individuals with this celebrated instrument. Besides the greatest safety from explosion resulting from its use, it is a thorough check against careless stoking and feeding. In marine engines it will regulate the exact quantity required in the "blow off." Pamphlets containing full information, can be had free on application to the Agent

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Civil Engineer, 5 Wall st.

MACHINERY.

Henry Burden's Patent Revolving Shingling Machine.



THE Subscriber having recently purchased the right of this machine for the United States, now offers to make transfers of the right to run said machine, or sell to those who may be desirous to purchase the right for one or more of the States.

This machine is now in successful operation in ten or twelve iron works in and about the vicinity of Pittsburgh, also at Phoenixville and Reading, Pa., Covington Iron Works, Md., Troy Rolling Mills, and Troy Iron and Nail Factory, Troy, N. Y., where it has given universal satisfaction.

Its advantages over the ordinary Forge Hammer are numerous: considerable saving in first cost; saving in power; the entire saving of shingler's, or hammerman's wages, as no attendance whatever is necessary, it being entirely self-acting; saving in time from the quantity of work done, as one machine is capable of working the iron from sixty puddling furnaces; saving of waste, as nothing but the scoria is thrown off, and that most effectually; saving of staffs, as none are used or required. The time required to furnish a bloom being only about six seconds, the scoria has no time to set, consequently is got rid of much easier than when allowed to congeal as under the hammer. The iron being discharged from the machine so hot, rolls better and is much easier on the rollers and machinery. The bars roll rounder, and are much better finished. The subscriber feels confident that persons who will examine for themselves the machinery in operation, will find it possesses more advantages than have been enumerated. For further particulars address the subscriber at Troy, N. Y. P. A. BURDEN.

Railroad Spikes and Wrought Iron Fastenings.

THE TROY IRON AND NAIL FACTORY, exclusive owner of all Henry Burden's Patented Machinery for making Spikes, have facilities for manufacturing large quantities upon short notice, and of a quality unsurpassed.

Wrought Iron Chairs, Clamps, Keys and Bolts for Railroad fastenings, also made to order. A full assortment of Ship and Boat Spikes always on hand.

All orders addressed to the Agent at the Factory will receive immediate attention.

P. A. BURDEN, Agent,
Troy Iron and Nail Factory, Troy, N. Y.

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CHILLED RAILROAD WHEELS.—THE UNDERSIGNED are now prepared to manufacture their Improved Corrugated Car Wheels, or Wheels with any form of spokes or discs, by a new process which prevents all strain on the metal, such as is produced in all other chilled wheels, by the manner of casting and cooling. By this new method of manufacture, the hubs of all kinds of wheels may be made whole—that is, without dividing them into sections—thus rendering the expense of banding unnecessary; and the wheels subjected to this process will be much stronger than those of the same size and weight, when made in the ordinary way.

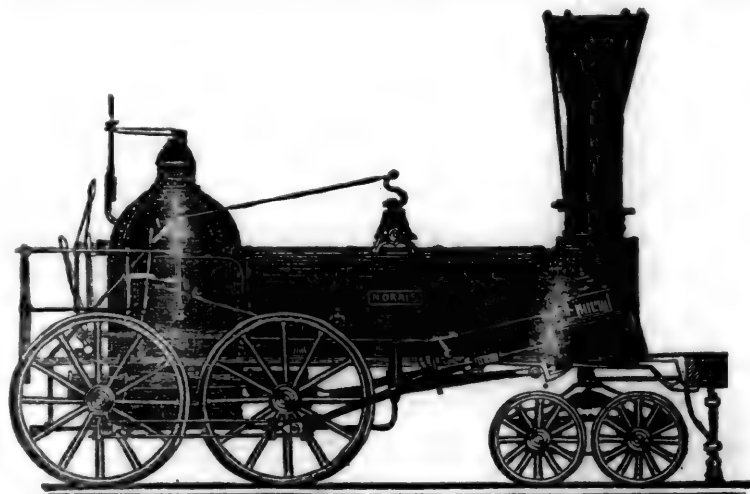
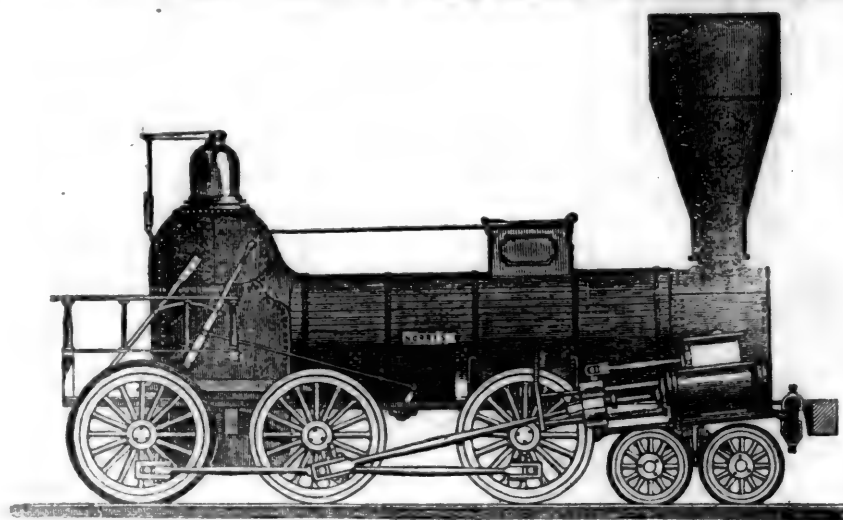
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Willow St., below 13th,
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Kensington, Philadelphia Co., }
March 12, 1848. }

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THE UNDERSIGNED Manufacture to order Locomotive Steam Engines of any plan or size. Their shops being enlarged, and their arrangements considerably extended to facilitate the speedy execution of work in this branch, they can offer to Railway Companies unusual advantages for prompt delivery of Machinery of superior workmanship and finish.

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The Troy Iron and Nail Factory have all ways on hand a general assortment of Horse Shoes, made from Refined American Iron.

Four sizes being made, it will be well for those ordering to remember that the size of the shoe increases as the numbers—No. 1 being the smallest.

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AMERICAN RAILROAD JOURNAL.

STEAM NAVIGATION, COMMERCE, MINING, MANUFACTURES.

HENRY V. POOR, Editor.

ESTABLISHED 1831.

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ASSISTANT EDITORS,

J. T. HODGE, *For Mining and Metallurgy.*
GEN. CHAS. T. JAMES, *For Manufactures and the Mechanic Arts.*
M. BUTT HEWSON, C. E., *For Civil Engineering.*

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American Railroad Journal.

PUBLISHED BY J. H. SCHULTZ & Co., 136 NASSAU ST.

Saturday, January 26, 1850.

Lead Ores.

ROSSIE LEAD MINE—ST. LAWRENCE COUNTY, N. Y.

The Reports of Dr. Beck and Dr. Emmons, State Geologists, contain minute descriptions and illustrations of the mines of Rossie, examined by the latter at different times in the course of the survey. And an anonymous article in Silliman's Journal, vol. XLII., contains farther details. From the style and character of this article it seems entitled to more credit, than ought as a general rule to be given to anonymous articles on mines.

Several veins have been discovered in the vicinity of the one known by the name of the Rossie Lead Mine or the Coal Hill Mine. I shall, however, confine my remarks to this, which is the principal one. The locality is about six miles from the River St. Lawrence, and eighty rods from Indian river, two miles from its entrance into Black Lake. The village of Rossie is $2\frac{1}{2}$ miles north of the mine. The rock formation is gneiss containing much horn

blende; over this comes in the Potsdam sandstone within no great distance to the North. The veins however appear to be confined to the gneiss rock. "This is distinctly stratified, but its strata are remarkably contorted and twisted. The surface is quite uneven and broken by protruding ledges, whose ranges vary from northeast to northwest; it is in a line nearly perpendicular to these ranges that the veins of lead are found. The Coal Hill mine was first discovered upon the face of one of those ledges, which was between sixty and seventy feet in height. When first uncovered, it presented the appearance represented in the cut.* The whole vein in the face of the ledge was thus laid bare, the galena appearing in the central part of the calcareous spar in a white or silvery stripe, being coated with disintegrated carb. lime, mixed, it is said, with a small quantity of carb. lead." "The vein is four feet wide, and is filled with calcareous spar and galena, the latter having only a width varying from two or three inches to eighteen; probably the average width is about 10 inches. Its direction is south 82° east, (or according to Dr. Beck, SSE, NNW), and its dip about 85° north. The galena is distributed through the gangue of spar rather sparsely at some points of the vein, but generally it is disposed in nearly parallel lines in the form of subordinate veins. Large masses of lead are occasionally met with weighing several hundred pounds."

"The Coal Hill mine has been worked to the depth of 200 feet. The mining has been carried on by two distinct companies—the eastern division or section by the Rossie Lead Mining Company, and the western section by the Rossie Galena company. Of the profits which have accrued to either of these companies, the public have never been furnished with official reports. There is no doubt, however, but losses have been sustained by both companies. The pressure of the times, the fall of the price of lead, but more than all, the interest upon the capital of the purchase money, not only must have been a great drawback on immediate profits, but must have rendered the prospects in future hopeless. That the owners may succeed in working this vein at a profit is highly probable."†

The situation of the mine does not appear to be very favorable for working. The country around

* The cut referred to will be given in our next number.

† Prof. Emmon's State Report, p. 355.

it is low and swampy, and though six miles from the St. Lawrence, and in the midst of hills, their bases are only 150 to 200 feet above its level. The rock however is described in Silliman's Journal as having few fissures, through which water is discharged, and hence is kept easily dry. He considers that the mine must eventually be wrought to profit, and that the ore is inexhaustible. But besides the trouble of water, it has another to contend with, from which the great western mines are principally free. The ore occurs so intimately mixed with the gangue, that it cannot be taken directly from the mine to the furnace, but must first be subjected to an expensive process of crushing and jigging and washing. And as at the greatest depth attained, the proportions of ore to the gangue did not seem to increase, there is little hope that this labor may be in any wise diminished. The operations both of mining and smelting appear to have been conducted at these works with more liberality and skill than is found at the western lead mines.

The furnace operations, to which I shall refer again in the account of the Wisconsin mines, were well managed, as the piles of slag now lying around them fully testify, being as I am informed by an intelligent smelter from Wisconsin, who has carefully examined them, apparently quite clean of lead, strikingly different from the slags at the west. "The amount of lead smelted from the mines in 1837 and 1838 was 4,137,871 lbs.; in 1839 about 1,200,000 lbs.; in 1840 about 400,000 lbs."—*Silliman's Journal*.

The ore occurred for the most part crystallized in large cubes, and in a variety of modifications derived from this form. A portion was fine granular ore like that known at the west as "steel-grained." Few localities in the United States have furnished more splendid crystals and a greater variety than this vein. The crystals of galena were usually found in groups lying in the calcareous spar, precisely it appears like the groups of crystals of native copper in the calc. spar veins of Lake Superior. Single crystals sometimes weighed thirty-five pounds; and in their forms they presented many of the numerous modifications belonging to the passage of the cube into the regular octahedron. The calc. spar gangue was also itself highly crystallized and in a variety of the modifications of its common form. The finest specimens of double refractive carb. lime probably ever found in the country, are from this vein. The crystals of sulphuret of

iron in forms between the cube and pentagonal dodecahedron are also of singular beauty and perfection. Copper pyrites and blende are associated with these, the latter however of rare occurrence; and some beautiful specimens of crystallised sulphate of strontian of a blue color have been found.

Two analyses were made by Dr. Beck of the galena with nearly the same results—one gave sulphur 13.2, lead 85.4, carb. lime and loss 1.4 per cent. The specimen was part of a cubical fragment, its specific gravity 7.5; a minute proportion of silver was found, but too little to be of any practical importance.

This no doubt is one of the most promising lead mines of all those opened in the Eastern States north of Virginia. From the number of other veins like it in the same vicinity, it would seem that nature might have intended this originally for a lead district, and that it is still possible it may yet prove of this character. But as it is not found to be sufficiently productive to compete with the western mines, notwithstanding all its favorable features and the skill and enterprise brought to bear upon the development of its resources—the chance of other mines not so promising in their indications is certainly much lessened. H.

Memoranda on Brooklyn Water Works.

Brooklyn, a city of some hundred and twenty thousand people, and situated at the centre of the commercial activity of this Continent, is up to the present moment dependant on pumps and cisterns for a supply of the first necessary of life—water. With the magnificent example of this city, and also the splendid example of Boston taunting the people of Brooklyn, it is quite time that they should move seriously in a measure for supplying themselves with what, in reference to health and cleanliness, is the best preserver of life, and in reference to accident and incendiarism, is the best preserver of property. The sanitary inquiries in Great Britain and Ireland have brought out medical facts on the subject of water—supplies which may well startle a people of even stupid indifference or sluggish energies, and which amongst a people so active and intelligent as our neighbors of Brooklyn, have already acted as stimulants to exertion. Apart from the consideration of water works as the only means of supplying by proper filtration, to a large city pure water for personal cleanliness and health, we may observe that such works must be the forerunner of all others of sanitary improvement.—The deposit of a city of 120,000 people might be estimated at some 300,000 tons; and without a sufficient supply of water to sweep this deposit, through proper sewers into the natural outlet, the citizens must inhale an atmosphere poisoned with the gases evolved from the decomposition of some eight tons of foetid animal and vegetable matter per hour.—The effects of such an atmosphere are not observed by individual experience: but extended observation traces most distinctly to this and such local causes, the variations of longevity and the prevalence of disease. Further, as a matter of commercial economy to a community, water-works are a decided saving: besides the increased supply, the saving of money in cisterns, pumps, carriage, they will in a large city almost liquidate their cost by the saving effected under the head of insurance. Insurance on house property in New York fell on the opening of the Croton aqueduct fully 25 per cent., and is at this moment lower by that per centage than the insurance on property of the same kind in the city of Brooklyn.

Major Douglass, the able Engineer of the Cro-

ton aqueduct has published a report on the means of supplying Brooklyn with water. He discusses 3 propositions that had been mooted in the case; and in the outset condemns the first of these—that for drawing the supply from the Croton aqueduct. We quite agree that such a course as this would be highly injudicious, seeing that independent of any other objection we must expect that in the ordinary course of its progress, New York will soon require for its own people the undivided supply of the Croton aqueduct. The two other suggestions discussed are: the one that the city be supplied by regularly graduated catchment-drains, contoured for the necessary distance a little above the level of the sea; the other that it be supplied by large wells sunk to such a level as to collect the waters supposed to be held at present within the loose material of Long Island. The Major supports this last proposition. He grounds his decision in the case on the supposition that the Island being generally a loose gravel formation, the rain falling on it is held in suspension within the strata until such time as it can by hydrostatic pressure percolate into the river on the one side or into the ocean on the other. In support of this premiss the Major remarks that a glance at the map of Long Island will show in the fewness of its ponds and water-courses the absorbing character of its strata generally, and that when a pond or a water-course does occur, it always indicates a change in the formation. These as well as we can remember them are the views put forward by Major Douglass in his report on the supply of water to Brooklyn.

M. Arago states that only one-third of the water falling in rain on the basin of the Seine passes into the sea through that river; the other 2-3ds being therefore distributed under the heads of evaporation, the support of vegetable life, and subterraneous drainage into the sea. Mr. Rennie's experiments on the discharge of the Thames would go to fix nearly the same proportion between the drainage of that river and the rainfall on its basin; but of the remaining two-thirds in this latter case, a proportion passes off through the apertures of the chalk formation, inasmuch as besides the fact of those apertures being large and numerous the Artesian wells in the valley of the Thames always yield a supply after the boring has passed through a bed of chalk resting on the impervious 'London clay' of the district. Now it is quite uncertain what amount of rain may be held by the strata in either of those cases; but if we were to form an idea of the amount from the supplies furnished by the Artesian wells of London or Paris, we should fix it at a very low figure. The Artesian wells of London require constant deepening, and like those of Paris show a constant falling of the water-line to the extent of from twenty to sixty feet; and yield a supply so very scanty that in London, where with a depth of several hundred feet, they would be expected to command an immense range of basin, the brewers who draw from them have been obliged to make an arrangement that each will draw from his well on different days. But will not the peculiar circumstances of the rain-fall in this country make the quantity absorbed less than in either Paris or London? This would look very likely.—In the latter the rain-gauge shows a series of long continued, drizzling falls: but here the rain falls generally in comparative torrents—to the extent in New York of an inch per hour for the maximum fall, while in London the maximum fall is about one inch in twenty-four hours. On this proportion rain in England would be absorbed as 24, while

here (the strata being alike) it would be absorbed in the proportion of only 1. This is certainly the extreme case: but it may be safely inferred that a much larger proportion of rain is discharged over the surface in the neighborhood of New York than over a like surface in the neighborhood of London or Paris. The question then becomes: How far does the greater absorbing powers of the Long Island formation affect the case? Nobody can tell; and therefore we must wait for further facts before we can pretend to fix the probable limit of supply from wells of the sort recommended by Major Douglass.

It is a well known fact that the wells in the London district are strongly impregnated with the peculiar components of sea water; and we would hesitate therefore to incur such a liability under circumstances so predisposing to that result as the narrowness of Long Island and the looseness of its soil. Besides: it seems likely that the direction of the drainage of the island being from the middle, towards the sound on one side and towards the sea on the other, any water absorbed in a material so loose will pass over the short and rapid incline into the natural outlet very rapidly. In fact it would seem probable that if the soil absorb quickly it must give out quickly; and that therefore the supply would not be constant.

All these remarks are simply speculations in the absence of facts; and are stated here to urge on the Brooklyn people the wisdom of Major Douglass's advice as to the necessity for a careful scientific survey. In the first place, a series of sections at certain intervals should be taken across such portion of the Island as may be necessary to furnish the proper supply of water; and from the levels (above high water) so obtained a set of contour lines should be laid down on the map in order to ascertain the number of acres situated above the several levels of the several contours. Along the several lines of section, boring should be made with (for ordinary depths) the borings rod described in the number of this Journal for the 4th of August, 1849, and the result of these borings, including also the level at which water was met (and if possible whether the same were fresh or salt), should be registered on the section. Every spring and stream within the limit of inquiry should be shown on the map, and each made a subject of the strictest inquiry with a view of ascertaining: 1st, for springs, the level at which each issues, the amount and variations of its discharge in dry and in wet weather, etc.: 2d, for streams, the average grade, the minimum and the maximum section, the continuance of floods, etc. By means of the borings, the lie of the strata might be laid down, and the area of any impervious bed calculated. When these and such other facts as might arise in the course of the inquiry shall have been ascertained satisfactorily an intelligent engineer will be in a position to make up his mind as to the best means of supplying the city of Brooklyn with water; but in the face of the many grounds of apprehension suggested above, we would earnestly caution the people of Brooklyn against running into any outlay for water-works until such information shall have been collected to the fullest extent, and collected too under enlightened direction. M. B. H.

Our Virginia exchanges state that the house of delegates passed a bill authorizing a subscription by the State of forty two thousand dollars to the stock for constructing a railroad from Staunton to Covington; and also a bill guaranteeing the bonds issued by the town of Petersburg as subscription

to the Southside railroad. In discussing the former bill in the house of delegates Mr. Segar made a speech of which we extract the following portions from the Norfolk Whig:—

The third impediment to the cause of internal improvement, whose operation will be more disastrous for the future, and end unless removed, in the entire destruction of the system, is the loose and disjointed policy we have hitherto pursued. Our plan has been that of local appropriations—of local improvements. Made as they have been, and as they must, without a change continue to be, without reference to a fixed system, composed of leading lines of improvement, the aggregate debt of the state is rapidly enlarging, and without any prospect of returning profit. Gentlemen know well the operation of this policy. One county asks an appropriation for a mere neighborhood work—a road, perhaps, from one court-house to another: a second asks another, and a third, and a fourth, and so on, until the amount is prodigiously swelled by the aggregate of these many appropriations. Look at your table, groaning under the weight of petitions coming from all quarters of the state for grants of money. What is the result? That no discrimination is made between those works which promise to be profitable and those which do not. The resources of the state are frittered away on local and unprofitable works, instead of being expended on great central lines that will return the interest and principal of investment. The ultimate consequence will be, that the whole policy of internal improvement will be cast into disrepute. The fund for internal improvement becomes charged with unavailable works.—As the evil progresses taxation is increased to sustain this loose system—and finally, the people, looking to the profuse expenditure and seeing nothing coming in, will become dissatisfied with the whole policy of improvement, and in disgust abandon it forever.

Now this evil must be eradicated, and it can only be done by adopting a *system*, in contradistinction to the lax policy of our past legislation. The wound upon the body politic is them cut off with a sword, for both systems cannot co-exist, while the local plan would, of itself bankrupt the commonwealth by creating a perpetual charge upon the treasury. The moment we adopt a *system*, applications for local appropriations either cease to come to this body or they will lie unheeded on the table. When they reach us, we have the ready reply—"The faith of the state is already pledged to the full amount of her means, to certain central and general improvements—you must wait until these are completed—when completed, they will yield us profit, and then we shall be ready—for we shall have the greater means—to supply the wants of every section of the commonwealth.

Let not western gentlemen imagine that by this plan their local demands are indefinitely postponed—the postponement will be temporary only. Nor on the other hand, let eastern delegates suppose that the change of policy recommended by the committee, will increase the burthens of taxation. It can be shown, that it is the peculiar interests of the eastern people, to repudiate the plan of local appropriations, as it is peculiarly the interest of the western to except in exchange the system of general improvements. First, with respect to the east: The internal improvement fund is already charged with many unprofitable works—unprofitable, because of their local character. The aggregate is increasing and must increase, unless arrested in the mode now recommended. A debt of principle will therefore be constantly accumulating, which will make little or no return of interest. Substitute the general for the local, and an unprofitable is exchanged for a profitable system—for it will be shown in the sequel, that the routes recommended will yield a fair income. If, then, economy be the object of gentlemen, and they really wish that expenditures contributed by them for the outlay, they can only attain their object in one of two ways—either by stopping all public works, or adopting a system of general improvements.

And, for the like reason, it is the peculiar concern of the west to make the exchange advised by the committee. Let her not persist in a system which, while it dispenses but little good, will lose her friends in the east, and fix in the public mind

insuperable distaste to all improvement. How much more, said Mr. S., are the citizens of middle and western Virginia interested in works of a general character? Let the great central lines or stems be constructed, and local or lateral improvements follow necessarily. Then, to the latter, communicating with the former, cease to be mere neighborhood works, ensuring profit and promoting accommodation; whereas now they do neither to any available extent. Open their grand reservoirs and innumerable streams will glide to their bosoms, swelling by their tribute, their recipient channels into broad volumes, whose strong current enriching wherever it passes, shall roll into the Atlantic cities exhaustless stores of wealth.

These observations are full of good sense. A desultory system of railroad improvements must necessarily be inefficient and wasteful. We regret that Mr. Segar did not reduce his views to a practical application by urging on the House of Delegates some specific measure of remedy. There can be no doubt that a local improvement can have no claim to State support: and as in the confusion of desultory works it is quite impossible to say absolutely what is local and what is not, it becomes a matter of conscience with the representatives of the people at large to decline an appropriation for almost any road in the absence of a general design. There are points which are defined by the economic conditions of a general carrying trade as absolute centres for that trade; and until these points are established and wrought into an economic system of intercommunication we remain in quite as much doubt as to what is local as we do in reference to what is general. Let therefore a state legislature who would disburse the public money with business-like prudence—who would in fact apply it to works that must of a certainty yield the public not only a return, but the highest return on the monies by a development of industrial resources—lay down from the fullest information a map fixing absolutely for their State those lines of transit defined by the position of the State in reference to other States, and by the agricultural, geological, and other statistics of the State itself as lines of public importance. These should be comprehensive in their range, and being as it were the arteries of a system, might be made to control—in fact to define the whole system of minor channels. A map of this sort will show people what is to be done, and where to begin; it will give point and purpose to public improvements, will give a healthy impetus to railroad enterprise, by pointing out from the fullest information the particular work that must be the forerunner of improvement in any given direction; and will enable private associations to know at the very starting, whether and how far they may count on the support of the public in the object of their particular association.

IMPENETRABILITY AND COMPRESSION OF AIR.

Let a small piece of cork be placed floating on the surface of water in a basin or other vessel, and an empty glass goblet be inverted over the cork, so that its edge just meets the water. A portion of air will then be confined in the goblet, and detached from the remainder of the atmosphere. If the goblet be now pressed downwards, so as to be entirely immersed, it will be observed that the water will not fill it, being excluded by the impenetrability of the air enclosed in it. This experiment, therefore, is decisive of the fact, that air, one of the most subtle and attenuated substances we know of, possesses the quality of impenetrability. It absolutely excludes any other body from the space which it occupies at any given moment.

But although the water does not fill the goblet, yet if the position of the cork which floats upon the surface be noticed, it will be found that the level of the water within has risen above its edge or rim. In fact, the water has partially filled the gob-

let, and the air has been forced to contract its dimensions. This effect is produced by the pressure of the incumbent water forcing the surface in the goblet against the air, which yields until it is so far compressed that it acquires a force able to withstand this pressure. Thus it appears that air is capable of being reduced in its dimensions by mechanical pressure, independently of the agency of heat. It is compressible.

That this effect is the consequence of the pressure of the liquid, will be easily made manifest by showing that, as the pressure is increased, the air is proportionally contracted in its dimensions; and as it is diminished, the dimensions are, on the other hand, enlarged. If the depth of the goblet in the water be increased, the cork will be seen to rise in it, showing that the increased pressure, at the greater depth, causes the air in the goblet to be more condensed. If, on the other hand, the goblet be raised toward the surface, the cork will be observed to descend towards the edge, showing that as it is relieved from the pressure of the liquid, the air gradually approaches to its primitive dimensions. —*Magazine of Useful Knowledge.*

Case-Hardening.

Is the name of the process by which iron tools, keys, &c., have their surfaces converted into steel.

Steel when very hard is brittle, and iron alone is for many purposes, as for fine keys, far too soft. It is therefore an important desideratum to combine the hardness of a steel surface with the toughness of an iron body. These requisites are united by the process of case-hardening, which does not differ from the making of steel, except in the shorter duration of the process. Tools, utensils, or ornaments intended to be polished, are first manufactured in iron and nearly finished, after which they are put into an iron box, together with vegetable or animal charcoal in powder, and cemented for a certain time. This treatment converts the external part into a coating of steel, which is usually thin, because the time allowed for the cementation is much shorter than when the whole substance is intended to be converted. Immersion of the heated pieces into water hardens the surface, which is afterwards polished by the usual methods. Moxon, in his *Mechanic Exercises*, p. 56, gives the following receipt for case-hardening:—"Cow's horn or hoof is to be baked or thoroughly dried and pulverized. To this add an equal quantity of bay salt; mix them with stale chamber-ley or white wine vinegar: cover the iron with this mixture, and bed it with the same in loam, or enclose it in an iron box; lay it on the hearth of the forge to dry and harden: then put it into the fire, and blow till the lumps have a blood-red heat, and no higher, lest the mixture be burnt too much. Take the iron out, and immerse it in water to harden." I consider the vinegar to be quite superfluous.

I shall now describe the recent application of prussiate (ferrocyanate) of potash to this purpose. The piece of iron, after being polished, is to be made brightly red-hot, and then rubbed or sprinkled over with the above salt in fine powder, upon the part intended to be hardened. The prussiate being decomposed, and apparently dissipated, the iron is to be quenched in cold water. If the process has been well managed, the surface of the metal will have become so hard as to resist the file.

Others propose to smear over the surface of the iron with loam made into a thin paste with a strong solution of the prussiate, to dry it slowly, then expose the whole to a nearly white heat, and finally plunge the iron into cold water, when the heat has fallen to dull redness. —*Magazine of Useful Knowledge.*

Institution of Mechanical Engineers.

At a meeting of the above institution held at Birmingham, November 24th, R. Stephenson, Esq., M. P., in the chair, the following papers were read: *On the Construction of Railway Axles.*—By J. E. McConnell.

Continued from page 40.

It has always been considered that having first ascertained, from example and experience, the strength of sectional area necessary, under every circumstance, to sustain the load which the journal has to carry, the length of it was determined by the velocity or amount of friction to which it is liable. Judging from axles at present in use in

carriages and waggons, the length of bearing is twice the diameter of the journal: but on this, as well as other points on strength of material, there exists a great variety of opinion. Even the forms of journals are found to differ very much. Without attempting to decide on the merits of any of them I shall in the present instance content myself with stating that all my experience has proved the desirableness of maintaining rubbing or wearing surfaces of bearings as free as possible from sharp abrupt corners, sudden alterations in diameter, or sectional strength. Having thus treated the journals as regards the load and the friction upon them, I now proceed to estimate the various strains to which the axle is exposed whilst in motion.

The first strain to which the axle is subject is that arising from the weight of the wagon and load, which being received or resting on the journal, produces the greatest effect upon the axle at the outer face of the wheel-boss, and to which is to be added the momentum of the load in falling through spaces caused by inequalities or joints of rails. The injurious consequences of inequalities on the road, surface, and flat places on the surface of the wheel-tyre, upon the axle, by the jolting or perpendicular motion which they produce, cannot be accurately estimated, and these are very much increased when the bearing springs of the wagon or carriage are not sufficiently elastic, and do not yield to the shock or blow downwards, so as (to use the expression) to cushion its effect. As an instance of the imperfect action of the springs, I would allude to those in use on many wagons, in which the form and construction cause them to be so rigid that the downward blow is more like a hammer upon an anvil. To obviate this strain as much as possible, it is necessary to proportion the spring so as to sustain the load properly, and yet to be of sufficient elasticity to absorb the effect of the load oscillation. The strain arising from the oscillation of the wagon on curves from imperfect coupling, and increased by the lateral freedom or space on the bearings or play between the rails and flanges of the wheels which, when an irregularity occurs on the side of the rail, or any sudden cause disturbs the direct motion of the wagon onwards, is in effect the same as a blow upon the flange of the wheel, the radius of the wheel tending to act as a lever to break the axle at the inner face of the boss of the wheel. This strain is the compound ratio of the momentum of the load, the angle at which the wheel strikes the rail, and the distance from the centre of the axle to the point of impact: producing an effective strain upon the axle at the inner face of the wheel boss, which extends proportionately over the whole axle between the wheels. To lessen in practice as much as possible the deteriorating effect of these descriptions of strains upon the axle, the following conditions are important:—

That the bearings or journals of the axle fit as closely to the brasses as is consistent with freedom, the allowance of flange gauge of wheel being quite sufficient for the carriage to move freely round curves and meet any irregularity in the gauge of the rails. That the wagons or carriages be as equally loaded as possible, and the draw-chains be exactly in the centre; and as side chains are dangerous, they should be completely removed, provision being made for a duplicate centre draw-chain should a failure occur. As the damage to the loading of wagons is in proportion to the oscillation, they should all be screwed together by means of screw-couplings having spring buffers upon both ends of every wagon. It is well known that the injury to the wagon, to the load which it conveys, to the axle which carries it and to the road over which it runs, is very much aggravated if the wagons are allowed to oscillate from side to side, and become like so many battering-rams, injuring themselves and all substances in contact with them. A train of wagons or carriages should be jointed together similar to the vertebrae of an animal, by which means any sudden lateral action would be neutralised by the support derived from the neighbouring vehicle. The road to be kept as accurate as possible to gauge and line. The third class of strains to which axles are liable are the shocks produced by starting and stopping a train, and which are in proportion to the momentum of the wheel and axle at the time of collision when stopping, and to the velocity of the impelling force and the inertia of the wheel and

axle when starting these strains are felt principally on the neck of the journal. Fourth strain, the torsion or twisting produced owing to wheels travelling over curves of the line; the difference in length of surface of the inner and outer rail compels the one wheel to grind or slide upon the rail, while the other is free to roll. This strain is proportionate to the load on the wheel, determining the amount of friction upon the rails, and the length of axle between the wheels; a slight amount of torsion is also produced from any variation in the diameter of the wheels on the same axle, by any inequality of load upon each journal, the quality of the brasses, or the amount of lubrication proportionately, and the strain of the break-block on one side, because when any of these occur separately or jointly, one half of the extra strain on one journal is transmitted through the axle to the other, and twisting or weakening the axle is necessarily produced. To lessen the amount of the above strain, it is obvious that the wheels should be kept in the best possible state of repair, so far as equal diameters and true circular surfaces are concerned, the wagons or carriages should be loaded equally on each side, the journals carefully lubricated, and all break blocks to bear the same pressure on both wheels of the same axle. Fifth strain, the constant vibration of the whole axle. This is more particularly the case, and is accelerated when the axle is fixed in a rigid, unyielding wheel. My experience has proved that the axles fixed in cast iron wheels are very much more liable to deterioration than those in wrought iron wheels, and the jar or vibration tending to deteriorate the quality of the iron, by altering its texture from fibrous to crystalline, is clearly visible in its effects in several fractures which I have seen. It would appear that the cast iron wheel acted more like a hammer on the axle, and as in the cold-swaging process a gradual breaking up of the fibre at the back of the wheel goes on, which is shown by an annular ring, varying from $\frac{1}{8}$ inch to $\frac{1}{4}$ inch in breadth, the strength is completely destroyed of this outer portion, and a sudden shock of the wheel upon some point of the road completes the fracture.

Among other causes which contribute to the deterioration of axles may be mentioned—the practice of throwing cold water on the axle to cool it, when it has become nearly red hot for want of proper lubrication in the journal. With regard to the strain to which the portion of the axle between the wheels is subject, there can be no doubt if the form of the axle is so proportioned that any blow transmitted through the wheel is received equally along the whole body of the axle, and the sectional strength at each point is fairly balanced to resist the effect of the blow, the axle will then be best suited to prevent deterioration at any particular place. With the view of determining the weakest point of a common wagon axle under different circumstances, I made a few experiments, as follows:

In the first experiment the power was applied to the flange of the wheel, and the resistance (as in the case of a railway axle when running) at the centre of the opposite wheel; the result was that the axle began to bend from a straight line $12\frac{1}{2}$ in. from the boss of that wheel to which the power was applied, and there is no doubt that if the power had been continued the fracture would have taken place within the $12\frac{1}{2}$ inches.

As a proof of this, in the second experiment, an axle of precisely the same dimensions and form, on being bent alternately backwards and forwards (the power being always applied on the same wheel at opposite points) was broken at the twelfth time of bending, within 6 inches of the back of the wheel.

In the third experiment the power and resistance were exactly in a parallel line to the centre of the axle, and the result, as might be expected, was a curve of a nearly uniform radius; proving that although the form of this axle was adapted to receive the blows of both wheels at precisely the same instant, and to the same extent (an impossible circumstance in practice), it was not suited to receive alternate strains or shocks, to which all axles are subject in ordinary use. The sizes of the axles in the above three experiments were precisely alike.

In the fourth experiment another axle of the same dimensions was taken, and reduced at the centre in a lathe to the following dimensions: The axle was divided into eight equal spaces from the

back of the wheel to the centre of the axle. Immediately at the back of the wheel the axle was 4 inches diameter, and the deflection was $9\frac{1}{4}$ inches; at the first space the diameter was $3\frac{1}{4}$ inches, and the deflection $8\frac{1}{4}$ inches; at the second space the diameter $3\frac{3}{16}$ inches, and deflection 7 inches; at the third space the diameter $3\frac{1}{16}$ inches, and deflection $5\frac{1}{4}$ inches; at the fourth space the diameter $2\frac{15}{16}$ inches, and deflection $4\frac{1}{4}$ inches. Up to this point the axle maintained a straight form from the back of the wheel: and from this point to the centre of the axle, as shown by the deflections, it assumed a fair curve, proving that the axle was weaker towards the centre than it ought to have been, and that the first 12 or 14 inches from the wheel having maintained the straight form was stronger in proportion.

In the fifth experiment the axle was reduced to $2\frac{1}{4}$ inches in the centre, and with power applied similar, as in the last case, the weakness at the centre was more perceptible.

In the sixth experiment the axle was made of another form, weaker immediately at the back of the wheel and at the centre. We had here two bends or curves, with a straight portion between them.

In the seventh there was an improvement upon the sixth, but it did not realise a perfect balance of strength at the different points.

In the eighth experiment, this was fairly accomplished, the proportion being as follows: From the back of the wheel to the centre of the axle, the sizes were 4 1-16 inches diameter, $3\frac{1}{4}$ inches diameter, 3 inches diameter, $2\frac{1}{2}$ inches diameter, 2 13-16 inches diameter, $2\frac{1}{4}$ inches diameter, 2 11-16 inches diameter, 5 11-16 inches diameter, $2\frac{1}{4}$ inches diameter; the half-length of the axle being divided as before, into eight equal spaces.

To be continued.

Finances of Maryland.

Treasurer's Report.

We copy below, from the Baltimore American, the following abstract of the annual report of the Treasurer of the State of Maryland, for the fiscal year ending 1st December, 1849. The receipts and disbursements for the year are thus recapitulated in the report:—

Balance in the Treasury on the 1st December, 1848.....	\$315,495 32
Receipts in the year ended 1st December, 1849.....	1,315,439 80
Derived from the following sources, viz:	
\$403,270 12 from direct taxes which accrued in the year.	
154,744 27 from direct taxes of former years.	
192,010 87 from other than direct taxes (which accrued in the year) and were levied under acts to aid in paying interest on the public debt.	
12,759 71 from like taxes of former years.	
228,569 77 from internal improvement companies.	
1,705 52 from loans on account of Tobacco Inspection.	
1,539 35 from bank bonus, and a sale by Deputy Attorney General.	
260,146 23 from ordinary revenue (which accrued in the year.)	
9,672 78 from like revenue (which accrued before.)	
1,273 69 from repayments.	
12,356 71 from tax for colonization.	
37,590 78 from State Tobacco Inspection.	
\$1,315,439 80 making an aggregate of.....	\$1,631,385 12
The disbursements in the same year amounted to.....	1,146,492 16
And were on the following accounts, viz:	

Interest on the public debt.....	\$715,555 95
Redemption of funded arrear interest.....	260,307 81
Annapolis & Elk Ridge railroad.....	3,935 56
Maryland Penitentiary.....	3,750 00
Public buildings at seat of government.....	28 62
State Colonization and Colonization Society.....	10,631 11
State Tobacco Warehouses and Inspect'n.....	24,263 91
Ordinary expenses.....	128,019 20

\$1,146,492 16

Leaving in the treasury 1st December, 1849, a balance of..... 484,892 96
The estimated receipts for the current year are set down at \$1,218,580 68.

The expenditures for the current year are estimated at \$912,036 09.

The Treasurer goes on to say—

The foregoing report exhibits a state of prosperity in the fiscal condition of the state, surpassing the anticipations of the most sanguine; and highly creditable to the wisdom and firmness of those who originated and consummated the measures which have led to such auspicious results.

The annual reports for the last five years show a progressive improvement in the receipts from internal improvement companies, and from those sources of revenue which have been provided to aid in paying the interest on the public debt.

This increased revenue, besides meeting all demands on, and leaving a large balance in the treasury, has enabled the Treasurer, in pursuance of the authority vested in him by chapter 238 of 1847; to purchase and redeem, in the course of the year, two hundred and sixty thousand one hundred and eighteen dollars and ninety-eight cents of the funded arrears of interest.

The capital of the sinking fund is now one million eight hundred and ninety thousand three hundred and eighty-seven dollars and fifty-nine cents.

Those data authorize the inference, (provided the present revenue system be undisturbed, and no additional burdens be imposed upon the treasury;) that the means which have been provided to relieve the state from her financial embarrassments, and place her in the elevated position she ever before occupied among her sister states, will be adequate not only to accomplish these paramount objects, but also, in about fifteen years, to extinguish the entire public debt.

That accomplished, the ordinary revenue, with that derived from her internal improvements, will be sufficient to defray all the ordinary expenses of the government, and will leave a handsome surplus to be applied to the purposes of education or such other objects of general interest as may be deemed worthy of state patronage.

D. CLAUDE, Treasurer, Md.

Treasury, Annapolis, 1st Dec. 1849.

Singular Accident on the Portsmouth, Saco and Portland Railroad.

We have the following particulars of the accident on the eastern route on Wednesday, from Longley and Co.'s Express. When the train was within about half a mile of N. Berwick, and going at a rapid rate, one of the wheels of the last car, belong to the Boston and Maine railroad train, which was full of passengers, suddenly broke, falling upon the track. The car was instantly thrown upon one side, and uncoupled from the remainder of the train. Every exertion was used by the conductor and others upon this train to stop the cars, and hasten to the assistance of those in the one overturned. They found that the stove had been thrown to one side, the coals scattered about, and that the inside was all in a blaze. A part of the passengers had succeeded in getting out, but the remainder were in rather a dangerous position, it being difficult, from the position of the car, to get through the doors or windows. With the assistance of the other passengers, they were all however, rescued without any having suffered serious injury, though many were badly burned, some bruised, and almost all lost cloaks, hats, muffs, or

umbrellas. Within 15 or 20 minutes after the breakage, the car was reduced to ashes. It was almost unaccountable that no lives should have been lost, either from the shock of the first overturn, or from the fire. A passenger in the train describes the scene as thrilling in the extreme. Every seat in the car was occupied, at the time of the accident, by men, women and children. From its windows proceeded volumes of smoke, and the cries and frantic attempts of those imprisoned within were quite appalling.—*Boston Traveller.*

NAUMKEAG STEAM COTTON COMPANY.

From the Treasurer's report at the annual meeting of the stockholders, held on Wednesday, we learn that the affairs of this corporation are in a most flourishing condition. The net earnings for the year past, after paying upwards of \$28,000 for interest, repairs, and new machinery, have amounted to \$82,390—not one dollar has been charged to "construction" account for the year's operations. A dividend of 4 per cent. has been declared for the past six months, and a surplus reserved fund is left, amounting to \$48,500. The last year's dividend has been 8 per cent.

The aggregate amount of goods manufactured in 1849 was 5,394,100 yards. The mills have used 3789 bales of cotton. The stock of cotton now on hand consists of 2063 bales, all of which was purchased previous to the recent advance in the price. This is expected to be sufficient to keep the mill in operation till next August.—*Salem Observer.*

Commercial.

Commerce with California.—The whole number of clearances at different ports in the United States for California, since Jan. 1, 1849, has been 707 as follows viz:

New York.....	214	Belfast, Me.....	3
Boston.....	151	Mobile.....	3
New Bedford.....	42	Newport R. I.....	2
Baltimore.....	38	Bristol.....	2
New Orleans.....	33	Holmes' Hole.....	2
Philadelphia.....	31	Saco, Me.....	2
Salem.....	23	Thomaston, Me.....	2
Bath, Me.....	19	Wilmington, N. C.....	2
Portland, Me.....	13	Stonington.....	2
Bangor.....	13	Plymouth.....	1
New London.....	17	Barnstable.....	1
Providence.....	11	Mystic, Conn.....	1
Eastport, Me.....	10	East Machias, Me.....	1
Nantucket.....	8	Frankfort.....	1
Fall River.....	7	Cherryfield.....	1
Charleston, S. C.....	7	Bridgeport, Conn.....	1
Newburyport.....	6	Newcastle, Me.....	1
Gloucester.....	6	Portsmouth, N. H.....	1
Warren, R. I.....	6	Searsport, Me.....	1
Sag Harbor.....	6	Hyannis.....	1
Norfolk.....	5	Norwich, Conn.....	1
New Haven.....	5		
Edgarton.....	4		707

Of the above clearances, 368 were from New England, and 339 from all the other States. The proportion of North and South is as 619 is to 88.

Connecticut.

Canal Railroad.—At the annual meeting of the Canal railroad company, held this morning, the following gentlemen were appointed Directors for the year ensuing: Joseph E. Sheffield, Harvey S. Hoadley, Henry Whitney, Gouverneur Morris, J. T. Gerry, William Johnson, Wm. H. Ellis, Wm. A. Larned, Russel Hotchkiss.

At a meeting of the directors, subsequently, Jos. E. Sheffield was elected President; Jas. S. Redfield Secretary; Stephen D. Pardee, Treasurer; and Henry Farnham, Superintendent.

Boston and Maine Railroad.

To the Honorable Senate and House of Representatives:

In presenting the fifteenth annual report of the Boston and Maine railroad, the directors beg leave to remark that the past year has been one of vicissitude and trial for this road, inasmuch as, in addition to fluctuations of business, occasioned by the monetary condition of the country, and by the vis-

tation of that pestilence which has traversed our land and diminished materially the public travel, conflagrations have repeatedly reached the property of the corporation, and destroyed a costly bridge at Salmon Falls, and all the extensive repair shops at Lawrence, involving the company in heavy losses, which, with the destruction previously experienced of a freight house and a large amount of merchandise at Dover, have caused an actual annihilation of property exceeding seventy thousand dollars in amount. These accumulated losses to the company, have proved a serious drawback upon its earnings, and thus curtailed the dividend.

The usual July dividend has been delayed to the end of the year by the action of the stockholders in the protracted inquiry and severe scrutiny which they caused to be instituted through their committee of investigation. The result of this examination into the company, proves the unquestionable soundness of the enterprise, and calls for renewed diligence on the part of the directors; and must give to the stockholders and the public the fullest confidence in the future prosperity of the road.

The following statement shows the business of the past year:

The reserve fund by the last annual report amounted to.....	\$48,272 45
Income for the year ending Nov. 30th	
from passengers.....	332,214 00
For freight.....	168,974 21
Mails, rents, and use of road.....	21,147 30

\$570,607 96

The expenditures, properly chargeable to the operating of the road, and for depreciation of engines and cars..... 276,199 42

294,408 54

* From which, is to be deducted, as extraordinary charges for this year, the items for loss of Salmon Falls bridge, car shop at Lawrence, committee of investigation, and interest..... 53,491 19

\$240,917 35

A dividend has been paid on 35,568 shares of 5½ per cent..... 195,634 00

Leaving as a present reserve..... \$45,293 35

Capital Stock..... \$4,140,000

Increase of capital since last report..... 600,000

Capital paid in per last report..... 3,249,804 52

Capital paid in since last report, (362,305 are due and payable Jan. 1, in addition)..... 466,065 00

Total amount of capital stock paid in..... 3,715,869 52

Funded debt, per last report..... 176,000

Funded debt paid since last report..... 10,000

Funded debt, increase of, since last report..... nothing.

Total present amount of funded debt..... 166,000 00

Floating debt, per last report..... 121,985 93

Floating debt paid since last report..... 17,949 96

Floating debt, increase of, since last report..... nothing.

Total present amount of floating debt..... 104,035 97

Total present amount of funded and floating debt..... 270,035 97

Average rate of interest per annum, paid during the year..... 5,719 per ct.

Maximum amount of debt for each month during the year, viz: January, \$250,000; February, \$246,000; March, \$243,000; April, \$305,000; May, \$373,000; June, \$380,000; July, \$377,000; August, \$347,000; September, \$420,000; October, \$285,000; November, \$322,000; December, \$270,000.

Cost of Road and Equipments.

For graduation and masonry, per last report.	\$821,488 57
For graduation and masonry paid during the year.....	43,335 87
Total amount expended for graduation and masonry.....	864,824 44
For wooden bridges, per last report.....	354,390 80
For wooden bridges paid during the past year....	9,206 08
Total amount expended for wooden bridges.....	363,596 88
Total amount expended for iron bridges, (if any)....	nothing.
For superstructure, including iron, pr. last report	873,052 57
For superstructure, including iron, paid during the past year.....	145,092 49
Total amount expended for superstructure, including iron.....	1,018,145 06
For stations, buildings and fixtures, per last report.	373,586 82
For stations, buildings and fixtures, paid during the past year.....	71,159 78
Total amount expended for stations, buildings and fixtures.....	444,748 60
For land, land-damages and fences per last report.....	602,071 26
Land, land-damages fences, paid during the past year.....	117,679 07
Total amount expended for land, land-damages and fences.....	719,750 33
For locomotives, per last report.....	115,540 46
For locomotives, paid during the past year.....	13,182 27
Total amount expended for locomotives.....	128,722 73
For passenger and baggage cars, pr last report	60,350 00
For passenger and baggage cars, paid during the past year.....	6,100 00
Total amount expended for passenger and baggage cars.....	66,450 00
For merchandise cars, per last report.....	108,027 80
For merchandise cars, paid during the past year....	nothing.
Total amount expended for merchandise cars.....	108,027 80
For engineering, per last report, and agencies and other expenses.....	263,333 76
For engineering paid during the past year, agencies and other expenses.	6,464 72
Total amount expended for engineering and agencies and other expenses.....	269,793 48
* This amount is obtained by adding interest, and deducting depreciation of engines and cars, as below, under the head of "Estimated depreciation beyond renewals," and may be stated thus:	
Amount at the foot of returns.....	\$46,179 85
Add interest, which is not strictly a running expense.....	25,016 17
	\$71,196 02
Deduct depreciation of engines and cars, which is a running expense..	17,704 83
	\$53,491 19
For agencies and other expenses, per last report.	nothing.
For agencies and other expenses, paid during the past year.....	included above.
Total amount expended for agencies and other ex-	

penses..... 3,984,057 32
Deduct 1200 tons iron not used, a \$42..... 54,000 00

Total cost of the road..... \$3,930,057 32

It may here be remarked that in the expenditures proper, for the last year, is included a considerable amount of charges, incurred in previous years which go to swell the cost of operating the road.—It has been deemed quite important by the present board to reach and liquidate every claim chargeable upon the road, and this has been successfully accomplished, with the exception of certain land damages and demands for personal injury, which were considered too exorbitant to be submitted to, but these, with the exception of the mill pond lands in this city, will not probably exceed fifty thousand dollars, while the property on hand, not required for the use of the road, which may be made available at some future time, will fully provide for these contingencies.

A careful appraisal has been made of all the stock and materials on hand for repairs, and of the wood for the use of the road, so that its position is known with a good degree of accuracy.

A considerable outlay will be required the coming year, for new depot buildings at Andover, Lawrence and North Andover, as provided for by the stockholders, and also for new engines, passenger and merchandise cars, and repair shop at Lawrence, to meet the growing demands upon the company.

The capital stock of the company being increased by the sum of \$600,000 at this time, and additional facilities being furnished to the public, it has become necessary to raise the fares to an average of about two and a half cents per mile. This increase, however, will not exceed that of most of the costly roads terminating in Boston, and will still be below that of some of them, and cannot, it is believed, be considered burdensome by a reasonable public.

New avenues of ingress and egress are extended to this road, and since the last annual report, arrangements, mutually satisfactory, have been made with the following roads for the conveyance of freight and passengers, viz:—the Great Falls and Conway, the Cohecho, the Essex, the Lowell and Lawrence, and Manchester and Lawrence railroads, already in operation, and the South Reading Branch road, about to be constructed.

Ohio.*Scioto and Hocking Valley Railroad.*

We find in the Scioto Gazette a synopsis of the report of the Engineer, Mr. Webb, of this road, the material part of which we give below:

The starting point of leveling was low water mark on the Ohio—the line of measurement begins on the north line of Portsmouth. Thence, the course of the river was followed, keeping on ground not likely to overflow, to Piketon; thence, on the east side of Scioto, to Richmond; thence across the table land, to Chillicothe; thence, in a direct line, to Circleville; thence, to Lancaster; thence, near Baltimore, to Newark. Chillicothe is 158 feet above low water mark in the Ohio; Circleville, 221 feet; Dividing Ridge, between waters of Scioto and Hocking, 586 feet, and 365 feet above the town of Circleville; Lancaster is 365 feet above Ohio low water mark; and Newark, 363. The highest grades, it is perceived, are between Circleville and Lancaster.

Mr. Webb divided the whole line into four divisions, for the purpose of measurement, graduation, estimation, &c. The whole distance is 116½ miles. All the estimates are made on a scale which the engineer deems fully adequate to the completion of the line, in the most substantial manner, on the plan proposed. These include the use of the heavy T or H rail—after the necessary clearing, grubbing, excavation, &c., and the ballasting of the road one foot thick and ten feet wide, with good gravel. Cross ties 6x10 in., 8 ft. long are to be imbedded every 2½ feet; and on these the rails are to be laid and securely fastened by means of cast iron chains or chairs or spikes. The cost is counted, as follows, viz:

1st Div., 37 miles, from Portsmouth to Richmond, \$387,425 85; or, \$10,471 05 per mile.

2d Div., 31 miles, from Richmond to Circleville, \$337,943 65; or, \$10,900 60 per mile. This includes two wooden bridges, 100 feet span, supported by arched trussings, abutments and piers of range stone work, well grouted, across the Scioto river.

3d Div., 32 miles, from Circleville to Baltimore, \$370,710 70; or, \$11,584 71 per mile. This includes the heaviest grading on the line.

4th Div., 16½ miles, from Baltimore to Newark, \$137,482 22; or, \$8,457 12 per mile.

To the aggregate sum, \$1,233,511 42, is added \$61,675 58, for engineering and contingencies;—making the total cost, not including depots, cars, engines, etc., \$1,141 39 per mile.

In concluding his report, the able and excellent engineer observes:

"The route generally traverses an interesting district of country, unsurpassed in the fertility of its soil in Ohio, not mountainous, but sufficiently undulated to be eminently adapted to agricultural pursuits. Its mineral resources have never been fully developed. The inexhaustible beds of iron ore and coal are alone sufficient to render your investment in the stock of this railroad a profitable one; and all this business, together with the very large amount that would naturally flow in from the east, north and south, this road would do without danger of rivalry."

Massachusetts.

Boston and Lowell Railroad.—The annual report of the Lowell Railroad gives the following as the income derived from the upper roads connecting with that company:

From the Concord, for passengers.....	\$20,022 82
Nashua.....	14,853 96
Boston, Concord and Montreal.....	4,481 41
Northern.....	4,015 36
Passumpsic.....	3,496 48
Vermont Central.....	3,040 64
Concord and Claremont....	345 35
Stoney Brook.....	165 67

Total from passengers..... \$50,421 60

From the Concord, freight.....	\$34,939 71
Nashua.....	15,762 48
Northern.....	12,542 32
Passumpsic.....	11,456 14
Vermont Central.....	9,327 52
Boston, Concord and Montreal.....	7,425 46
Wilton.....	4,269 10
Stoney Brook.....	1,747 47
Concord and Claremont....	1,466 28

Total from freight..... \$98,936 48

Total from passengers and freight from upper roads..... \$149,358 17

Connecticut.

The following is about the length, respectively, of the parts of the railroads mentioned, which lie within the State of Connecticut, and which are now completed and in use:

Of the New Haven, Hartford and Springfield road.....	54 miles.
Middletown Branch.....	6
N. Haven and Northampton.....	41
N. York and N. Haven....	47
Naugatuck.....	62
Housatonic.....	74
Norwich and Worcester....	53
Stonington.....	4
N. London, Willimantic and Palmer.....	46
Hartford and Willimantic..	44

Total miles in use, within the State..... 431

The total length of all these roads, when completed, will be, within and without the State, some 730 miles; but the portion now completed and in use, within the State limits, is, as given above, about 431 miles.

Maine.

Portland and Montreal Railroad.—The receipts from passengers for December, 1849, were \$6,075 92. The freight receipts are not yet fully made out.

The following table exhibits the amount of receipts from passengers and freight respectively for each month in the year, excepting the freight receipts for December:

	Passengers.	Freight.
January.....	\$3,437 11	\$1,931 98
February.....	3,469 89	2,915 04
March.....	5,238 37	4,138 94
April.....	4,274 11	3,000 72
May.....	3,951 13	3,093 64
June.....	4,665 65	5,182 59
July.....	6,763 18	2,021 58
August.....	7,517 55	2,714 97
September.....	7,317 76	2,725 43
October.....	7,525 22	4,696 86
November.....	6,657 35	4,848 22
December.....	6,075 92	

Total.....\$66,893 24 \$37,269 97

Making 104,163 21, as the total receipts of the road for the year 1849, exclusive of the freight receipts for December.—*Advertiser.*

Connecticut River Railroad.—The annual meeting of the stockholders of the Connecticut River railroad company was held in Boston on the 16th inst. The following gentlemen were chosen Directors of the company for the present year, viz: Samuel Henshaw, James K. Mills, Lemuel Pope, N. H. Emmons, Ignatius Sargent, and Graham Brooks, all of Boston; Erastus Hopkins, of Northampton, H. W. Clapp of Greenfield, and J. S. Morgan of Hartford; all being members of the old Board, with the exception of Mr. Brooks, chosen in the place of Dr. E. H. Robbins, deceased.

A dividend of 3 per cent is to be paid to the stockholders on the 1st of February.

—Of the gross receipts of this road for the year 49, \$192,072, \$106,261 were from passengers, \$79,648 from merchandise, \$3,823 from mails, and \$1,250 from the express. The aggregate receipts of the several quarters were as follows; 1st, \$32,331; 2d, \$49,434; 3d, 59,304; 4th, \$50,082. The total expenses of the year, were 95,090, which leaves a net income of \$96,982, or more than the total expenses.

Of the expenses, \$31,923 was incurred in the transportation department; \$16,489 at stations; \$13,948 in repairs on road, 747 ditto on bridges; \$1,362 ditto buildings; \$10,045 ditto engines; \$6,220 passenger cars, \$3,037 ditto freight cars; \$525 for clearing snow; \$1,161 for stationery, printing and advertising; and \$524 for damages. The wood used during the year cost \$16,363; the oil \$2,231.

North Carolina.

Wilmington and Manchester Railroad.—One Hundred Thousand Dollars.—On the 4th instant, General W. W. Harlee, the President of the Wilmington and Manchester railroad company, arrived here, and announced to our citizens, that unless one hundred thousand dollars additional subscription for the stock of the company could be made at once, he feared that operations on the line would have to be suspended, and moreover, that the chances for a re-commencement of the work were doubtful. Here then was presented the great crisis of the enterprise. It was met by our people in a bold, manly, and decisive manner. Meeting after meeting was held, and speech after speech was made, several by General Harlee himself, distinguished by all the intelligence of his mind and all the fervor of his feelings; active and influential citizens carried around subscription lists, public-spirited men of ability came forward and increased the amount of stock already taken by them, and new names were added to the subscription papers; in short, one grand, united effort was made, and by the night of the 10th inst., the required one hundred thousand

dollars had been made up, showing an aggregate of two hundred and eighty thousand dollars subscribed in Wilmington and its vicinity, nearly all in town, to the capital stock of the Manchester road. Enough of its stock has now been taken, [namely, \$750,000.] to entitle the corporation to claim the additional subscription of the state of South Carolina, amounting to \$200,000.

We do not see any very serious obstacle in the way of the success of the company in building the road, and that with all practical dispatch.—*Wilmington Chron.*

Indiana.

Evansville and Princeton Railroad.—The annual election for directors of this road, was held at the Court House on Monday. All the old directors were re-elected, with the exception of two, whose places were filled by Messrs. Willard Carpenter and Nathan Rowley. The board of directors is now composed of the following gentlemen: Sam'l Hall, Willard Carpenter, John Hewson, John S. Hopkins, James Lockhart, James G. Jones, Nathan Rowley, Sam'l Orr and John Ingle, Jr.

Samuel Hall, Esq., is President of the company, and Wm. Rowley, chief engineer.

We see by the Evansville Journal that the company have advertised for proposals for grading and bridging the road from Evansville to Princeton, a distance of 26½ miles. The time for receiving the same will expire February 20, 1850.

Georgia.

Memphis Branch railroad.—The profits of the Memphis branch railroad for the year ending January 1st are, we are pleased to learn, 11½ per cent. A dividend of 8 per cent. has been declared in favor of the stockholders.

Kentucky.

Mr L. L. Robinson, appointed by a meeting of the citizens of Maysville, to examine the route for the proposed railroad between Maysville and Lexington, has made a report. He has examined two routes, both of which he says are entirely practicable. He says: "I am more firmly than ever convinced, (after travelling through the counties to be traversed by the road,) that the road when completed, will be one of the best dividend paying stocks in the West."—*Commonwealth.*

Pennsylvania.

Schuylkill Navigation Company.—We have received the annual report of the President and managers of the Schuylkill Navigation Company. The following are the officers of this company for the ensuing year:

Frederick Fraley, President.

Managers—John R. Worrell, Eli K. Price, Geo. W. Carpenter, Joseph H. Seal, Joshua Lippincott, Nathaniel Lewis Paleske, Philip R. Howard, Benjamin Gerhard, Thomas T. Lea, Richard D. Wood, Charles H. Rogers, Geo. H. Thompson.

Charles W. Bacon, Treasurer and Secretary.

Memphis and Charleston Railroad.

The south seems quite in earnest in the matter of railroads. Already the Memphis and Charleston road, which was in only conception some few weeks ago, is beginning to assume the shape of a reality, and will, by a continuance of the spirit that has sustained it to the present time, be soon a matter of earth and iron. We observe by the Huntsville Dem. that the charter awaits the signature of the Governor of Alabama; and that the bill authorising the corporation of Huntsville to subscribe to the amount of \$100,000 in stock will be passed without opposition. The Legislatures of Tennessee and Mississippi are still to take action in the case of this most important work. By private advices received some short time since from William B. Miller, Esq., a gentleman very much

interested in the road, we are lead to look on the organization of this work as a certainty near at hand. God speed the good cause! Go on, gentlemen of the south: railroads are at once the measure and the agents of progress.

Massachusetts.

Damages.—John B. Patch has recovered of the Vermont and Mass. railroad co., \$2,500 damages received in 1847, by the breaking down of a bridge at Athol, over Miller's River.

Georgia.

Muscogee Railroad.—On the 7th instant, the following gentlemen were re-elected Directors of the Muscogee railroad: Maj. John H. Howard, Maj. R. S. Hardaway, Dr. R. A. Ware, Gen. S. A. Bailey, Hon. R. B. Alexander, H. Hall, Esq., and Col. J. Wimberly.

Macon and Western Railroad.—The annual meeting of the stockholders of this company took place at their office, in this city, on Tuesday last, when the reports of the President, Isaac Scott, Esq., and the superintendent, Mr. Foote, were presented and read. The reports of these officers indicate a high state of financial prosperity, and prove that the affairs of the company have been most ably managed. From these reports it appears the income of the road for the year ending on January 1, amounted to \$198,467 93; the expenses to \$87,698 67—leaving net earnings, \$110,769 26. Of the earnings, 112,270 88 were for freights, \$74,808 59 for passengers, and 10,100 for mail service. The whole number of passengers who travelled upon this road during the year, is put down at 35,517, and the to-distance run by all the engines of the company, in the same time, was 149,184 miles.—*Macon Messenger.*

New Hampshire.

Cochecho Railroad.—At a meeting of the Stockholders of the Cochecho railroad, at Dover, last week, it was voted to extend the road to Alton Bay, and to extend the stock to \$600,000 for that purpose. During the two months the road has been in operation, it has done much better than was expected by its friends. Its cost was \$374,833, of which \$200,885 were received from subscriptions, and \$4,000 from bonds, leaving \$148,314 of debt, of which \$52,314 are due to the company on unpaid subscriptions.—*Boston. Cour.*

ROADS AND RAILROADS.

BY W. M. GILLESPIE, A.M., C.E.

The Engineering profession, above all others, is that on which the progress of this country depends; and as our capital falls short of the rich resources which present themselves for development on every side, the husbanding of the national capital is so strong a necessity with us that, with a view to that end, we cheer on gladly all who endeavor to raise the Engineering profession to its true standard of science and practise. Science and observation are evidently necessary to the proper economy in mechanical construction: if an Engineer content himself within the narrow limit of his own experience he might as well have lived before the days of Rennie. "What has been done?" should be the question of every spare moment of an Engineer; and in the absence of an answer in strict conformity with a particular case, the only light to guide him is the light of science. A false step in an engineering work may cost thousands of dollars;—and therefore do we repeat emphatically that an Engineer must be not merely a working, but a reading man—a man read in principles and practice. We have been led into these remarks by the perusal of Mr. Gillespie's book on roads—a work of which we are glad to say the 3d edition has been just issued by A. S. Barnes & Co., of this city.

Mr Gillespie's book discusses the location, construction, etc., of all kinds of roads: while sufficiently scientific to be economic, it is also sufficiently popular to be plain. Mr. Gillespie seems exactly of the class of men we wish to see in the profession: men who make their science subservient to practice, and make both subservient to an enlightened economy. He states in his very interesting work a number of select facts, highly useful to the Engineer; and combines them with great point and clearness in practical applications. Every Engineer is bound to sustain such exertions to disseminate true Engineering knowledge; and we too, in our vocation, are bound to cheer on Mr. Gillespie, and all our brethren who, by placing like him the result of their study and practise on record, widen the limits of our professional knowledge, and thereby help, by husbanding the national capital, to the quicker progress of our common country.

AMERICAN RAILROAD JOURNAL.

Saturday, January 26, 1850.

Railway Damages.

We believe that there are municipal regulations prevailing in many of our cities, empowering the authorities to assess, in laying out new streets, a sum, in the shape of a tax, equal to the increased value of the real estate, consequent upon such laying out, as well as to allow damages to such as may be injured by the same process.

This is a rule of plain common sense, as well as justice, and creates no complaint from those affected by it. Public convenience demands the opening of a new way, and as the public, in its organized capacity, must execute this work, and must make proper compensation for individual injuries sustained, nothing can be more just, than that those who are individually benefited by it over and above the general convenience enjoyed by them in common with the public, should contribute something of this individual benefit, to make up the injury sustained by others, and which the public must make good. Now in principle there is no difference between a railway and a common highway. Both have the same end; and as railways are vastly better adapted to secure this end than the ordinary road; the former, for almost all purposes, will supersede the latter, as fast as they can be constructed. The relative influence of these two kinds of highways, in increasing the value of property affected by their construction, is at least in proportion to the superiority of the railway over the common roads, and we can see no reason whatever, why the same rule should not prevail in regard to damages arising from the construction of a railroad as is now observed and sanctioned by common consent, in the laying out of public highways in cities and towns.

Very few railways are built in this country, as a matter of investment of money. An agricultural section, for instance, feels the need of a railway for the purpose of sending its produce to a market. The return to be received in the shape of dividends for its cost, is but a secondary consideration with those who build it. The farmer who contributes five hundred dollars towards the project expects that it will be the means of increasing the value of his farm to twice that sum. The merchants aid it in the anticipation of the increase of business it will give them. The whole community expect to share equally in its benefits, and this community of interest is the reason why towns and counties, as well as States, lend their aid, in their corporate capaci-

ties, to such works, where there may not be sufficient individual strength for their construction.

Now where a whole community is engaged in the construction of a railroad, why should it pay an individual member a thousand dollars for injury sustained by running through his land, when the road itself may quadruple its value? It should not. The right to take, for a proper consideration, one person's land for the benefit of the public is incident to the sovereignty of every State, but where the same act that takes his land betters his condition, such person certainly has no claim upon the community for an act required by the public good.

We hold that in no case whatever should a man be assessed for the benefits received by the construction of railways. If he is benefitted, that is his good fortune. If he claims damages, only the balance of injury over benefit received should be allowed him. Such regulation would protect individual rights, and at the same time relieve the public of paying exorbitant sums in the shape of damages to those who are vastly benefitted by the very act of which they complain.

It may be argued that in laying out streets in cities, the land in such cases is taken by the public, but that a railway represents private individuals, and consequently that the parallel does not hold good. But railways are public works, and are recognised as such by the very authority given them to take private property necessary to their construction. The law directs that those suffering injury in consequence shall be paid to the amount of such injury. The public and not the stockholders are the gainers, just in proportion to the cheapness of the road, as rates of charges are graduated in proportion to its cost.

We hope that this subject will receive general attention, and that efforts will be made to secure the passage of such laws as will extend a well-known and acquiesced-in principle to the construction of railroads. We feel satisfied of its justice, and we are equally satisfied the novelty of its application will be found to be the great objection to its adoption. Proper care should of course be taken that private rights are properly guarded, while at the same time the interest of the many are equally well protected against individual cupidity.

Maine.

Buckfield Branch Railroad.

We have often had occasion to speak of the progress of railways in Maine, under the influences which have there been actively at work for the last five years. Over one hundred miles of new road have been opened the past year, and her great lines extending west, north and south are all in progress at the present time. The road to Montreal is to be completed in three years; the York and Cumberland railroad seems likely to be finished in much less time, and the road from Portland to Augusta is now advancing at several points on the line from Brunswick to Augusta, and from North Yarmouth to Portland; and a large and enthusiastic meeting at Bangor has been held the present week to take measures to extend the railway from Waterville to Bangor. There is also the Androscoggin railroad, from Greene to Jay, in rapid progress, which promises to be the cheapest road in New England.

Among the various enterprises which have been successfully accomplished within the last few years we know of no one which, under like circumstances, has done more to advance the cause of railways, to raise the character of the State abroad, or that gives more sincere pleasure by its construc-

tion, among its own people at home. It is a work that reflects credit upon all the parties engaged in it, and demonstrates, to the satisfaction of the most skeptical, the fact, that railways can be successfully undertaken by people of the interior of the country, and finished at far less expense than has been generally supposed.

Some three years ago, the people in the town of Buckfield embarked in the plan of constructing a branch railroad from some convenient point on the line of the Atlantic and St. Lawrence railroad to the village of Buckfield, a thriving little manufacturing place, in the midst of a good agricultural district, the town itself, however, containing less than 2,000 people. The surrounding towns, whose population naturally came to this point on their way to market, embraced some 6,000 to 8,000 people, all of whom united in the work of constructing this 13 miles of railway on the gauge of 5 ft. 6 in. in union with that of the Atlantic and St. Lawrence railroad, mainly for the purpose of giving themselves greater facilities for business and for their own accommodation. A favorable line for a railroad was found, from the village of Mechanic Falls, in Minot, and the people subscribed at once an amount of stock sufficient to grade and equip the road, furnish station houses, &c., and placed the whole line under contract, trusting to their credit for the means to pay for the iron rails. The work was placed under contract in October, 1848. The grading was principally finished in the course of twelve months, notwithstanding the severe money pressure during the whole period, and the means were entirely raised along the line of the road; many of the stockholders paying into the contractors labor and materials which was in that way made available towards their assessments.—The whole cost of grading the road and fitting it for the superstructure was less than four thousand dollars per mile, including engineering and all other expenses.

The charge of the work was committed to A. T. Arrowsmith, Esq., as Chief Engineer. The contractors were Messrs. Benson & Porter, though the management of the work was conducted by Mr. Benson.

The management of the affairs of the company devolved principally on the Hon. VIRGIL D. PARRIS, President of the corporation, to whose industry, prudent management, and good judgment the company is largely, if not mainly, indebted for its success. He contracted with Messrs. Wainwright & Tappan, of Boston, for the iron in January, 1849, at \$42 50 per ton, free on the wharf at Portland. The rail used is the approved form of the bridge pattern, weighing 50 lbs. to the lineal yard.

HON. F. O. J. SMITH, who is so well known in the telegraph, advanced the money for the iron, taking the bonds of the company secured by a mortgage on the road. The rails were laid during the fall of 1849, and on the 15th of the present month the road was open for travel. In passing over the line on this occasion, I was struck with the substantial appearance of the work, and the spacious depots at West Minot, and at the terminus of the road at Buckfield. The material is generally a fine gravel abounding upon the line of the road. The road-bed is principally an embankment, raised from 2 to 3 feet above the ordinary level of the country, which seems to keep the track clear of obstruction by reason of the snow and ice.

The whole work has been done at an expense less than \$9,000 per mile, and will not exceed \$10,000 or

\$11,000 per mile with a fair equipment. The means have all been furnished as required by the people of Buckfield and the towns adjacent, except the money for the iron.

Similar exertions in other parts of Maine, will give railroad facilities to every portion of that great State. We cannot omit the opportunity to express, not only our satisfaction, but our admiration of the effort that has achieved so noble a work. The low cost of the road and the cheapness of building it, will aid towards making it a good paying stock, while it confers upon the people of this hitherto excluded region, the inestimable blessings which the railway scatters along its path.

At the opening of the road, the most lively demonstrations of satisfaction were exhibited at Buckfield. Speeches were made on the occasion, by the President of the company, Mr. Parris, the Hon. Judge Preble, Hon. John Anderson, R. A. L. Codman, Esq., and John A. Poor, Esq., of Portland.

We cannot fail to congratulate the stockholders and friends of the enterprise upon this auspicious result. They will be richly repaid for their noble exertions in the enhanced value of all their lands and other property, and in the increased accommodation which each one will thereby enjoy.

Railway Progress.

At the commencement of the past year, we gave a detailed statement of the extent of railroads in the United States already constructed, with an enumeration of those in progress. We now give a similar table with such corrections and additions as our greater means of information and the progress of railways have enabled us to make.

In our present number are embraced the railroads of New England. The whole number of miles in operation the 1st day of January, 1850, were 2,300½.

The whole extent of railway opened in the above States the past year is 605½ miles.

The whole amount expended upon the above works, together with those now in progress, but not yet opened, cannot be less than \$100,000,000.

The above will give some idea of the extent to which these works have been pushed in this section of the country.

MAINE.

Roads in Operation January 1, 1849.

Calais and Baring.....	3 miles.
Machiasport.....	8
Bangor and Piscataquis (to Oldtown).....	11½
Portland, Portsmouth and Saco.....	51
Boston and Maine.....	2
Atlantic and St. Lawrence.....	28
Androscoggin and Kennebec.....	6½
	110½

Opened in 1849.

Androscoggin and Kennebec.....	48½
Atlantic and St. Lawrence.....	19
Portland and Kennebec.....	25
Bath Branch.....	9
Opened in 1849.....	101½

Total.....	211½ mls.
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Roads in Progress.

Buckfield Branch (13 miles opened January 17, 1850.)	
Atlantic and St. Lawrence.	
Portland and Kennebec.	
York and Cumberland.	
Calais and Baring.	
Androscoggin.	

NEW HAMPSHIRE.

In Operation January 1, 1849.

Eastern.....	16 miles.
Nashua and Lowell (9½ miles in Mass.).....	5½
Concord.....	34
Boston and Maine.....	35½
Great Falls Branch.....	2½
Northern.....	69
Cheshire (54 in all).....	43
Boston, Concord and Montreal.....	36
Bristol.....	13
Nashua and Worcester.....	7
	261½

Opened in 1849.

Sullivan.....	25½
Boston, Concord and Montreal.....	9
Concord and Claremont.....	18
Portsmouth and Concord.....	18
Cochecho.....	18
Manchester and Lawrence.....	25
Great Falls and Conway.....	9
Wilton.....	8
	132½

Total.....	394½ mls.
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Roads in Progress.

Boston, Concord and Montreal.	
Cochecho.	
Great Falls and Conway.	
Contoocook Valley.	
Ashuelot.	
New Hampshire Central.	
Portsmouth and Concord.	
Concord and Claremont.	

VERMONT.

Roads in Operation January 1, 1849.

Vermont Central.....	52 miles.
Connecticut and Passumpsic.....	40
	92 miles.

Opened in 1849.

Vermont Central.....	65
Rutland.....	119
Connecticut River.....	10
	194

Total.....	286 miles.
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Roads in Progress.

Connecticut and Passumpsic.	
Whitehall and Rutland.	
Vermont and Canada.	

MASSACHUSETTS.

Roads in Operation January 1, 1849.

Berkshire.....	25 miles.
Boston and Lowell.....	26
Woburn Branch.....	2
Boston and Maine.....	36
Boston and Providence (43 in all).....	38
Stoughton Branch.....	4
Dedham Branch.....	2
Boston and Worcester.....	45
Millbury Branch.....	4½
Saxonville Branch.....	4
Milford Branch.....	12
Cheshire.....	11
Connecticut River.....	50
Chicopee Branch.....	2
Dorchester and Milton Branch.....	3
Eastern.....	38
Marblehead Branch.....	4
Gloucester.....	14
Salisbury.....	3½

Fall River.....	42
Fitchburg.....	50
Hartford and New Haven.....	6
Lexington and West Cambridge.....	6½
Nashua and Lowell.....	9½
New Bedford and Taunton.....	20
Norwich and Worcester (66 in all).....	17
Old Colony.....	37½
Pittsfield and North Adams.....	20
Providence and Worcester.....	25½
Taunton.....	11
Vermont and Massachusetts (69 in all).....	49
Western.....	117
West Stockbridge.....	2½
Cape Cod Branch.....	27½
Peterboro and Shirley.....	12
Essex.....	21½
Stoney Brook.....	13
South Shore.....	11½
Nashua and Worcester.....	38
Lowell and Andover.....	13
Medford Branch.....	5½
Newton Falls Branch.....	3
Brookline Branch.....	1½
Bridgewater Branch.....	7½

893½

Opened in 1849.

Vermont and Massachusetts.....	10
Norfolk County.....	25
Harvard Branch.....	2
	30½

Roads in Progress.

Grand Junction.	
Fitchburgh and Worcester.	

RHODE ISLAND.

In Operation January 1, 1849.

Providence and Stonington (50 miles).....	45 miles.
Providence and Worcester.....	17½
Boston and Providence.....	5
	67½

Opened during 1849.....none.

In Progress.

Providence and Hartford.	
--------------------------	--

CONNECTICUT.

Roads in Operation January 1, 1849.

New York and New Haven.....	48 miles.
Norwich and Worcester.....	59
Housatonic.....	74
New Haven Canal.....	28
Hartford and New Haven.....	56
	259

Opened in 1849.

Naugatuck.....	62 miles.
New London and Willimantic.....	28
Hartford and Willimantic.....	28
Hartford and Fishkill.....	18
New Haven Canal.....	14½
	150½

Total miles in operation Jan. 1, 1850...409½

JONES' HOTEL,

NO. 152 CHESTNUT STREET,
PHILADELPHIA.

BRIDGES & WEST, Proprietors.

3,000 Tons Railroad Iron.

THE UNDERSIGNED IS PREPARED TO contract for the delivery of the above quantity at any port of the United States. Can be made of any required pattern and of a favorite brand.

CHARLES ILLIUS,
30 Beaver St., New York.

1m3

Engineering.

A GENTLEMAN OF TWENTY YEARS' EXPERIENCE in all branches of Engineering, Steam Engine and Steam Ship Building, Surveying, etc., during which time he has been engaged in special service of great trust by a foreign government, wishes occupation in his profession. Apply to
214* **HILGER & CO., 19 Platt st., N. Y.**

J. & Riley Carr,

Manufacturers of Cast, Shear, German and Blister
STEEL,

Of all Descriptions, Warranted Good.
BAILEY-LANE WORKS, SHEFFIELD.

R. S. DENTON, Agent.
NO. 20 CLIFF ST., NEW YORK.

STEEL AND FILES.

R. S. Denton,
20 CLIFF STREET, NEW YORK,

AGENT FOR

J. & Riley Carr's

BAILEY-LANE WORKS, SHEFFIELD,
Manufacturers of Cast, Shear, German and Blister

STEEL

Of all descriptions. Warranted Good
FILES.

Manufacturers of Machinists' Warranted Best Cast Steel Files, expressly for working upon Iron and Steel, made very heavy for recutting.

Hand. A full Stock of Steel and Files at all times on hand. 6m4

Brown's Old Established SCALE WARE HOUSE,

NO. 234 WATER ST., NEW YORK.

THE Subscriber, Practical Manufacturer of Scales of every description, respectfully asks the attention of Railroad Companies to his Improved Wrought Iron Railroad Track and Depot Scales which for strength, durability, accuracy, convenience in weighing, and beauty of workmanship, are not surpassed by any others in this country.

He is aware that this is rather a bold assertion for him to make, yet he can say with confidence that they have but to be tried to give them precedence over all others. **J. L. BROWN.**

Bank Scales made to order, and all Scales of his make Warranted in every particular.

References given if required. 4tf

Great American Mechanical Work.

D. APPLETON & CO. PUBLISH This Week, No. 1, with numerous illustrations, price 25 cts. **A DICTIONARY OF MACHINES, MECHANICS, ENGINE WORK AND ENGINEERING;** designed for practical working men, and those intended for the engineering profession. Edited by Oliver Byrne. To be completed in about 40 Nos. Price 25 cents each.

This will be the most practical, as well as the most perfect work ever published on Machines, Mechanics, Engine work and Engineering. The Mechanic, Engineer or Machinist, from the time he commences his profession till he arrives at the zenith of the most successful professional career, will find this an indispensable work of reference.

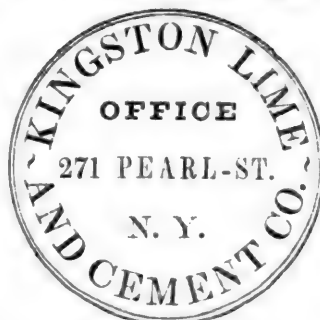
This volume will be of royal 8vo. size, containing nearly 2,000 pages, 1500 plates, and 6,000 cuts; it will fill up a chasm that has long been a requirement to practical working men, and those intended for the engineering profession. It will present Working Drawings and descriptions of every important machine in practical use in the United States, and independent of its American value as embracing the results of American ingenuity, it will contain a complete treatise on Mechanics, Machinery, Engine work, and the substance of at least a thousand dollars worth of books scattered in expensive folio volumes or magazines.

Seventy-five plates are embraced in the 1st No. among which are Atwood's Machine, Air Guns, Air Whistle, American Steam Excavating Machines, Anchors of every variety, Anemometer, "Absorbing and Productive Cascade," Aqueduct Wire and Suspension Bridges, Croton Aqueduct, all the Engineering of this stupendous work, Ancient matter used in the arts, etc.

No. 2 will be published next week, containing 176 plates.

AGENTS WANTED.

Several responsible and active men are wanted as Agents to procure subscribers for the above valuable work. Subscribers may readily be obtained in every city and village of the American continent. A liberal commission allowed. Apply to the Publishers, 200 Broadway.

Hydraulic Cement.

HYDRAULIC CEMENT, OF BEST QUALITY, manufactured at their works, for sale in lots to suit purchasers.

Also, Ground Lime, a superior article for Builders.

ISAAC FRYER, Sec'y.

January 19, 1850.

ly

BALL & CO'S PATENT Indestructible Water Pipe.

We publish below the opinions of others who have a personal knowledge of our Pipe, and would request all persons interested in the conveyance of water to investigate its merits for themselves. It being cheaper than Cast Iron pipes, and incomparably more durable (as there is no chance to commence decay but continually grows more permanent) it must supersede it altogether in works requiring durability and purity. Branching, taping, altering or relaying, is done with the greatest facility, and certainty, without injury, in any size of bore from 3 feet diameter down to 1/4 of an inch under any head that can be controlled with hose or service pipes. **J. BALL & CO.**

Corner of Read and Centre Sts., N. Y.

FOR the benefit of those who have requested information in regard to this excellent article, we insert the following testimonials in relation to its merits:

"In answer to the numerous inquiries in relation to J. Ball & Co's Indestructible Water Pipe, composed of iron and cement and in use in our village, the undersigned, water commissioners, trustees, and late trustees of the village of Saratoga Springs, take this method of saying that we have perfect confidence in the utility, goodness and durability of said pipe. The village of Saratoga Springs has some 20,000 feet of this pipe, varying from 6 1/2 to 14 in. in diameter, under a head of about 80 feet. It has been laid since the fall of 1846. Since it was fully completed, it has cost comparatively nothing to keep it in repair; and, although some portions are exposed to the frost, it seems to stand well the test, and answer all the purposes for which it was designed and constructed. We believe it preferable to iron pipe—is much cheaper and more durable, and we would not exchange it for any other kind of pipe yet invented, if we could without any additional expense or inconvenience. The water comes through clear and pure, and where we have had occasion to take any part of it up to improve or alter the grounds, it appeared to be just as sound and imperishable as the moment it was laid down. This testimony is entirely disinterested, and is now given to avoid the necessity of answering the many calls upon us for information on this subject. We have witnessed and many of us have superintended the laying down of the pipe in this village, and watched its operations since, and are perfectly satisfied that we have the best water pipe ever presented to the public. Saratoga Springs, Dec., '49.

G. M. Davidson, }
N. Putnam, } Water Com.
N. B. Doe, }
R. Gardner, }
H. P. Hyde, }
J. L. Perry, } Trustees.
J. D. Briggs, }
S. Chapman, }
J. A. Corey, } Late Trustees.
W. S. Alger, }
Wm. Cook, }

"I certify that I was Chief Engineer, having the construction of the above work in charge, and fully concur in the foregoing statement. Dec., 1849.

"S. R. OSTRANDER, Civil Engineer."
A card, signed by the Trustees or Water Commissioners of Saratoga Spa (village), expressing their unqualified approval of J. Ball & Co's Indestructible water pipe, has been shown me; whilst I fully endorse from my own experience, the statements of these gen-

tlemen, I am enabled to add that under my direction, some six thousand feet of cement pipe was laid by Messrs. Ball & Co., in this village, that the main pipe was of 10, 4 and 6 inches bore, and is subjected to a pressure due to an average head of sixty-five feet—it has fully answered my expectations. I would further state that, having been employed by the Common Council of Albany to report a plan of supplying that city with water, I had occasion very carefully to test the merits of this kind of pipe, and was so fully convinced of the practicability of using the cement pipe for large conduits, being of three feet in diameter, as well as for smaller ones, that I recommended its adoption in the proposed work, and give my reasons for so doing.

1st. That the cement pipe is far less expensive than that of cast iron or brick.

2d. That it will sustain an equal pressure with that of cast iron; and when used for large conduits, can be carried up and down the inequalities of the surface of the ground, saving the grading, which is indispensable if a brick one is used.

3d. That it can be readily and economically repaired, and, should it become necessary, can be taken up and relaid without injuring the pipe.

4th. That this description of pipe is not so much affected by frost as one of metal, and in no way impairs the quality of the water. **F. S. CLAXTON,**

Engineer and Ag't Cohoes Co.

Messrs. J. Ball & Co., New York.

Cohoes, December 31, 1849.

In addition to the above testimonials, we can state that, having had experience and personal knowledge in regard to the excellent qualities and durability of the above pipe, we have no hesitation in recommending it to the public.

Starr & Alburts, 122 Nassau st.

Frederick Marquand, per H. G. M., Atty.

James, Beebe & Co.

H. W. Metcalf, 63 and 65 Centre st.

Norman White, 111 Fulton st.

John J. Merritt, No. 76 Columbia st. Brooklyn.

Platt & Brother, 20 Maiden Lane.

Geo. Griswold, South st.

J. & J. W. Meeks, 14, 16 and 18 Vesey st.

Wm. Gale, 116 Fulton st.

J. C. Brown, Builder, 10 Dutch st.

Wm. Colgate & Co.

Thos. C. Smith.

O. R. Burnham, 17 and 19 Broadway.

G. B. Hartson, 63 and 60 Vesey st.

Wm. W. Campbell, 77 St. Mark's Place.

Lorin Brooks, 240 Broadway.

Messrs. J. Ball & Co.:

Gents.: Articles have appeared in the Farmer and Mechanic, from Saratoga and Cohoes, on the subject of your water pipes; I fully endorse their opinions. Your work for my son's water cure at South Orange, embracing a large amount of four and three inch pipe, under a head at least as great as the Croton of New York, shows not only certainty and efficiency, but what is equally important, perfect purity, which for medical purposes is all important, and should be considered so for drinking and other uses.

Yours, **SAML. MEEKER.**

Newark, January 11, 1850.

In addition to the above, we certify that J. Ball & Co. have inserted pipes for us of 10 inch bore and less, since the winter of 1844, and that last Spring we had over 1000 lbs. of lead pipe removed, and its place supplied with their pipe. We fully endorse the opinions expressed in the notices above.

BEACH, BROTHERS,

New York Sun Establishment.

Having for the past three years laid many of Messrs J. Ball & Co's patent cement pipes in the Newark Aqueduct Co., I prefer them to any pipe that I have used, their cost being one-third less than iron pipe, and also being free from wear and rust, and can most cordially recommend them for all aqueduct purposes.

SHELDON SMITH, Superintendent.

Newark, January 14, 1850.

THE NEWCASTLE MANUFACTURING Co. continue to furnish at the Works, situated in the town of Newcastle, Del., Locomotive and other steam engines, Jack Screws, Wrought Iron Work and Brass and Iron Castings, of all kinds connected with Steamboats, Railroads, etc.; Mill Gearing of every description; Cast Wheels (chilled) of any pattern and size, with Axles fitted, also with wrought tires, Springs, Boxes and bolts for Cars; Driving and other wheels for Locomotives.

The works being on an extensive scale, all orders will be executed with promptness and despatch. Communications addressed to Mr. William H. Dobbs, Superintendent, will meet with immediate attention.

ANDREW C. GRAY,

President of the Newcastle Manuf. Co.

LIST NO. 1, [To be Continued.]

Engineering, Railways, Machinery, Steam Engines, etc.

JOHN WILEY, 161 BROADWAY NEW YORK, has on hand and for sale the following Works on the above subjects:

SCOTT, (D.) The Engineer and Machinists' Assistant, being a Series of Plans, Sections and Elevations of Steam Engines, Spinning Machines, Mills for Grinding Tools, etc., taken from Machinists of approved construction at present in operation, 2 volumes folio, one of letter press, the other plates, half bound in Russia, \$18 00.

TREDGOLD, (T.) The Steam Engine, its Invention and Progressive Improvement, an Investigation of its Principles and its Application to Navigation, Manufactures and Railways, a new and revised edition with considerable additions, including enlarged Examples of Locomotive Engines for Railways, Marine Engines for Sea, River and Canal service, with the Construction of Steam Vessels, Stationary Engines employed for all kinds of Manufacturing purposes, Engines employed in Mines for Raising Water, or for supplying Towns with Water, Cornish Pumping Engine, Engines for Mill Work, Flour Mills, etc., High Pressure and Non-condensing Engines, issued Monthly, 15 parts are published at 75 cents each.

BUCHANAN, (R.) Practical Essays on Mill Work and other Machinery, 70 plates, 2 vols \$14 00. Supplement to do., 1 vol., 5 00.

BRIDGES. The Theory, Practice and Architecture of Bridges of Stone, Iron, Timber and Wire, 3 vols. royal, 8mo, half Morocco, 138 Engravings and 92 Wood cuts, \$25 00.

DUGGAN, (G.) Specimens of the Stone, Iron and Wood Bridges, Viaducts, Tunnels, Culverts, etc., of the United States Railroads, part 1 now ready, to be completed in about twelve monthly parts at 75 cents each.

FAIRBAIRN, (W.) The Conway and Britannia Tubular Bridges, together with an Experimental Investigation on Hollow Beams Constructed of Wrought Iron, illustrated with numerous engravings, 1 vol. royal 8vo, \$11 50.

AMERICAN LOCOMOTIVES, being a Treatise on the Theory of Steam, and its Application to Locomotive Engines, illustrated by 42 Elegant and Accurate Engravings of the most approved American Locomotives, and accompanied by full and clear explanations, designed for the use of Students, Builders and Working Engineers, by Emil Renter. The work will be completed in 16 monthly numbers, 5 numbers are now published, at 75 cts. each number. For sale by

JOHN WILEY,
Publisher and Importer,
161 Broadway, New York.**Ballard's Improved JACK-SCREW.**

PATENTED.

THE ADVANTAGES OF THIS Screw for Stone Quarries, Railroads, Steam Boiler Builders, and for other purposes are superior to any other similar machine.

The improvement consists in being able to use either end of the screw, as occasion requires.

It is capable of raising the heaviest Locomotive with ease, being portable, strong and powerful, and not likely to get out of order.

Many Railroad Companies and Boiler Makers have them in use—by whom they are highly recommended.

JACK SCREWS, of various sizes, power and price, constantly on hand at the manufactory.No. 7 Eldridge Street,
near Division Street.
New York, Jan. 19, 1860.**To Inventors and Patentees.**

OWEN G. WARREN, ARCHITECT, Has had many years' experience as Agent for obtaining Patents, both in this country and Europe, and will transact such business promptly and reasonably. Persons at a distance can have their business done by correspondence—without the necessity of visiting this city or Washington. Office No. 94 Merchants Exchange, Wall st., corner of Hanover st., upstairs. 173

Great American Mechanical Work.SUPPLIED TO SUBSCRIBERS ONLY.
PUBLISHING MONTHLY IN PARTS AT 75cts.

PART I, MEDIUM FOLIO OF SPECIMENS OF THE STONE, IRON, AND WOOD BRIDGES, VIADUCTS, TUNNELS, CULVERTS, &c., of the United States Railroads, illustrated by a Series of Drawings, from actual measurement of the works, including Plans, Elevations, Sections and details of each Structure, accompanied by remarks on the relative merits of the various forms of construction adopted, as regards economy, strength and durability, with Specifications, Estimates, Bills of Timber, Iron, etc., of the several structures; and an APPENDIX, illustrative of the art of Bridge Building as at present practised in Europe; and numerous original Designs for Bridges, Viaducts, Culverts, etc.; the whole calculated to meet the exigencies of Engineers, and assist Draftsmen, Bridge Builders, Mechanics and Students.

BY GEORGE DUGGAN,
ARCHITECT AND CIVIL ENGINEER.

New York: D. Appleton & Co.; John Wiley; Geo. P. Putnam; and Stringer & Townsend. Boston: Charles C. Little and James Brown. Albany: Little & Co. Philadelphia: George S. Appleton; Grigg, Elliott & Co., and Thomas Cowperthwait. Buffalo: G. H. Derby & Co. Baltimore: Cushing & Brother. Washington: Frank Taylor. Charleston: McCarter & Allen. Cincinnati: H. W. Derby & Co., and Bradley & Anthony. Richmond: A. Morris. Nashville: W. T. Berry & Co. New Orleans: T. L. White and David Felt & Co. St. Louis: J. Halsall. Natchez: W. H. Fox.

ADDRESS.

The want of a work such as the present is designed to be, has long been felt and regretted by the Engineering profession generally, but more especially by those engaged in Railroad constructions; where the number and variety of bridges are such as to make the mode of construction adopted of especial importance to all parties interested in such undertakings whether the mechanical skill, durability, or economy of these structures is considered. As regards the present undertaking, no pains or expense shall be spared to render it complete and efficient to the fullest extent for the various purposes of the Engineer, practical Bridge Builder, and Mechanical Student.

As an extensive circulation alone can meet the heavy expenses incurred in getting up this work, it is hoped that the members of the Engineering profession generally—for whose advantage it is especially designed—will extend to it the encouragement and support so necessary to its success and completion, in a manner that shall reflect credit on the spirit of enterprise, at present so rife in this great country, and also bear testimony to the mechanical skill and ingenuity of our Engineers.

MODE OF PUBLICATION, TERMS, ETC.

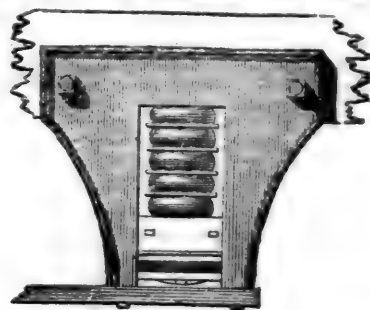
The First or American Division of this important work will be completed in about Twelve Parts, and the APPENDIX in about Eight Parts, each part containing Two double or Four single large folio plates, accompanied by appropriate letter press descriptions, Specifications, Estimates of the cost, Bills of Timber, Iron, &c. of each structure, presenting at a glance the comparative merits, as regards economy, strength, and durability of the various modes of Bridge construction at present practised by the most eminent Engineers in the United States.

The Engraving has been entrusted to first rate artists, and is executing in a manner that cannot fail to give satisfaction, while the price (Seventy-five cents a Month) is such as will place it within the reach of all who take an interest in our great mechanical contrivances.

It shall be optional with Subscribers to take the FIRST DIVISION of the work only, but the APPENDIX cannot be supplied to those who do not subscribe for the First Division.

N. B.—Members of the profession, and others wishing to become subscribers, are requested to send their names without delay to the author, as below, as the publication of the names of Subscribers in one of the early Parts has been determined on, and no more copies of the work will be printed than are found necessary to supply Subscribers. Parties remitting \$9, the cost of First or AMERICAN DIVISION of the work, shall receive it monthly as published, POST FREE, in any part of the United States.

Engineers in charge of Railroad Works, are respectfully requested to send Tracings of their Drawings of Bridges, &c., with the Specifications, Bills of Timber, Iron, &c., to GEORGE DUGGAN at his residence No. 179 Henry Street, New York, with a view to their insertion in this work. The Drawings should not, however, exceed 17 x 10, or 21 x 17 inches.

FULLER'S PATENT INDIA RUBBER SPRING.

THESE SPRINGS ARE THE CHEAPEST, the lightest and most durable of any yet known. They are easily applied to new or old cars, and there is small possibility of any accident occurring to them. Other parties through Mr. Ray set up claims to an India Rubber Spring which, though the same in principle, is very inferior in its working and durability. Actions are in progress for an Infringement on Fuller's Patent against parties using that Spring.

The superiority of Fuller's Spring over that claimed by Mr. Ray is fully established and has frequently been testified to. The following are from gentlemen who have had much experience with both Springs.

"It will afford me pleasure to recommend your springs to the companies in this region, in preference to Ray's which I am confident are inferior in mechanical arrangement to yours." JOHN M'RAE,
Engineer S. Carolina R. R., Charleston."I do not hesitate to allow you to say that I concur in Mr. M' Rae's opinion that Ray's springs are inferior in mechanical arrangement to Fuller's. I repeatedly expressed that opinion long before Mr. M' Rae had seen your springs (as I believe) and entertain it still." WM. PARKER,
Gen'l Supt. of Baltimore and Ohio R. R.Office of Supt' Norwich & Worcester R.R. Co.,
December 26, 1849.

"I most fully concur in the opinion of Jno. M' Rae, Engineer of S. Carolina Railroad, that 'Rays Springs are inferior to Fuller's Springs,' and shall with pleasure recommend them to all Railroad Companies for adoption. I have used both springs on this road and have no hesitation in saying that I should in all cases prefer Fuller's Spring."

SAM'L H. P. LEE, JR.,
Supt' and Engineer.Office B. & P. R. R. Co.,
Boston, 20th December, 1849.

"This company have cars fitted up with both Ray's and Fuller's 'Metallic India Rubber Springs,' and I do not hesitate to say that Fuller's arrangement is very much superior to Ray's."

W. RAYMOND LEE, Supt.

The following result has been obtained by experiment upon one railroad.

A set of Trucks fitted
with Steel Springs cost \$190-77 and weigh 2355 lbs.
The same with Fuller's
Springs, 131-71 " 1911 lbs.

Difference, 859-06 " 444 lbs.

Not only is there an advantage in the cost, but owing to the great reduction in weight, the car can be made lighter throughout, and so an enormous saving in weight may be effected in a Train.

G. M. KNEVITT, 33 Broadway, N. Y.,
General Agent for the U. S.The Springs can also be had of
JAMES LEE & CO., 18 India Wharf, Boston, &
JAS. THORNLEY, 110 Chestnut St., Philad.
January 2, 1850.**Wanted,**

A Second Hand Locomotive, weighing from 10 to 12 tons. It is required that in answer, it will be stated, whether the engine has inside or outside connections—the price of the same delivered at Portland, Maine, and terms of payment expected. Address

VIRGIL D. PANIS,
President Buckfield Branch Railroad,
Portland, Maine.

November 10, 1849.

3145

The New York Iron Bridge Co.

LATELY KNOWN AS

Rider's Patent Iron Bridge Co.

THE Company which has hitherto furnished these Bridges, under the patent granted to the late Nathaniel Rider, deceased, have become satisfied that all the principles embraced in their construction, are included in a previous patent, granted in the year 1839, to Col. Stephen H. Long, of U. S. Engineers, and by him designated as "Long's Suspension Bridges," and have therefore made an arrangement with Col. Long, by which they have secured the exclusive right to make and vend these Bridges throughout the whole United States.

The only change consequent upon the new arrangement will be found in the name and style of the Company. The parties composing it being the same, the construction of the Bridges will be essentially the same. August 4th, 1849. M. M. White, Agent, au7tf

No. 74 Broadway, New York.

To Contractors.

BLUE RIDGE TUNNEL.—The Contractor for the BLUE RIDGE TUNNEL, having failed to come forward and comply with his engagements, notice is hereby given that PROPOSALS will again be received at the Office of the Board of Public Works, until the 21st of January, 1850, for the construction of the Tunnel and approaches.

The Tunnel will be 4260 feet long, 21 feet high and 16 feet wide, with a ditch on each side; it will pass 700 feet under the top of the Mountain and decline from West to East at the rate of 70 feet to the mile. The approaches will be in the aggregate about 2000 feet long, and consist of deep cuts, high embankments, some walling and bridging.

Proposers who have not already examined the localities will do well to call at the office of the Engineer, on the spot, where they will obtain all necessary information.

The payments will be CASH, with a reservation of 20 per cent till the entire completion of the work; besides which, the contractor is required by law to give bond, with satisfactory bond and security in Virginia. The amount of the bond required will be thirty thousand dollars.

The best testimonials and an energetic prosecution of the work are expected: the contract and bond to be executed within ten days after the letting, and the work to begin *bona fide* within sixty days after the same period.

C. CROZET.

Engineer Blue Ridge Railroad.

Terms of proposals and specifications may be obtained at both offices.

NOTICE TO**Superintendents of Railroads.**

TYLER'S PATENT SAFETY SWITCH.—The undersigned would respectfully call their attention to his Patent Safety Switch, which from long trial and late severe tests has proved itself perfectly reliable for the purpose for which it was intended. It is designed to prevent the train from running off when the switch is set to the wrong track by design or accident. The single rail or gate switch is established as the best and safest switch for the ordinary purpose of shifting cars from one track to another, but it is liable to the serious evil of having one track open or broken when connected with the other. My improvement entirely removes this evil, and while it accomplishes this important office, leaves the switch in its original simplicity and perfection of a plain unbroken rail, connecting one track with the other ready for use.

The following decision of the Commissioner of Patents is respectfully submitted to Railroad Engineers, Superintendents, and all others interested in the subject.

P. B. TYLER.

(COPY.)

UNITED STATES PATENT OFFICE, }
Washington City, D.C., April 28th, 1846. }

Sir: You are hereby informed that in the case of the interference between your claims and those of Gustavus A. Nicolls, for improvements in safety switches—upon which a hearing was appointed to take place on the 3d Monday in March, 1846, the question of priority of invention has been decided in your favor. Inclosed is a copy of the decision. The testimony in the case is now open to the inspection of those concerned.

Yours respectfully, EDMUND BURKE,
Commissioner of Patents.

To Philos B. Tyler.

Any further information may be obtained by addressing P. B. TYLER, Springfield, Mass., or JOHN PENDLETON, Agent, 149 Hudson St., New York.

34tf

To Railroad Companies and Contractors.

FOR SALE.—Two Locomotive Engines and Tenders, at present in use on the Beaver Meadow Railroad, being too light for their coal trains, but well calculated for either gravel or light passenger trains.

They weigh, in running order, about 8 tons each—having one pair of driving wheels 4 feet diameter, 4 truck wheels 30 inches diameter, with cylinders 10 in. diameter, and 18 inches stroke of piston. Tenders on 4 wheels. Address JAMES ROWLAND,

Prest. Beaver Meadow Railroad & Coal Co., Philadelphia.

or, L. CHAMBERLAIN, Sec'y,
at Beaver Meadow, Pa.

May 19, 1849.

20tf

ENGINEERS.**Arrowsmith, A. T.,**

Buckfield Branch Railroad, Buckfield, Me.

Banks, C. W.,

Civil Engineer, Vicksburg, Miss.

Berrien, John M.,

Michigan Central Railroad, Marshall, Mich.

Buckland, George,

Troy and Greenbush Railroad.

Clement, Wm. H.,

Little Miami Railroad, Cincinnati, Ohio.

Cozzens, W. H.,

Engineer and Surveyor, St. Louis, Mo.

Davidson, M. O.,

Eckhart Mines, Alleghany Co., Maryland.

Fisk, Charles B.,

Cumberland and Ohio Canal, Washington, D. C.

Felton, S. M.,

Fitchburgh Railroad, Boston, Mass.

Floyd-Jones, Charles,

South Oyster Bay, L. I.

Gzowski, Mr.,

St. Lawrence & Atlantic Railroad, Montreal, Canada.

Gilbert, Wm. B.,

Rutland and Burlington Railroad, Rutland, Vt.

Grant, James H.,

Nashville and Chattanooga R. R., Nashville, Tenn.

Harry, P.,

Binghamton, New York.

Holcomb, F. P.

Southwestern Railroad, Macon, Ga.

Higgins, B.

Mansfield and Sandusky Railroad, Sandusky City, O.

Johnson, Edwin F.

New York and Boston Railroad, Middletown Ct.

Latrobe, B. H.,

Baltimore and Ohio Railroad, Baltimore, Md.

Sours, Peter,

Dauphin und Susquehanna Coal Co., Dauphin, Pa.

Miller, J. F.,

Worcester and Nashua Railroad, Worcester, Mass.

Morris, Elwood,

Schuylkill Navigation, Schuylkill Haven, Pa.

Morton, A. C.,

Atlantic and St. Lawrence Railroad, Portland, Me.

McRae, John,

South Carolina Railroad, Charleston, S. C.

Nott, Samuel,

Lawrence and Manchester Railroad, Boston.

Prichard, M. B.,

East Tennessee and Georgia R. R., Cleveland, Tenn.

Reynolds, L. O.,

Central Railroad, Savannah, Ga.

Roebbling, John A.,

Trenton, N. J.

Roberts, Solomon W.,

Ohio and Pennsylvania Railroad, Pittsburgh, Pa.

Robinson, James P.,

Androscoggin & Kennebec Railroad, Waterville, Me.

Schlatter, Charles L.,

Northern Railroad (Ogdensburg), Malone, N. Y.

Stark, George.,

Bost., Con. and Mont. R. R., Meredith Bridge, N. H.

Steele, J. Dutton;

Pottstown, Pa.

Trimble, Isaac R.,

Philad., Wil. & Baltimore Railroad, Wilmington, Del.

Tinkham, A. W.,

United States Fort, Bucksport, Me.

Thomson, J. Edgar.,

Pennsylvania (Central) Railroad, Philadelphia.

Whipple, S.,

Civil Engineer and Bridge Builder, Utica, N. Y.

Williams, E. P.,

Auburn and Schenectady Railroad, Auburn, N. Y.

Williams, Charles H.,

Milwaukee, Wisconsin.

Wormeley, Preble,

Central Ohio Railroad, Zanesville, Ohio.

BUSINESS CARDS.

Cumberland, (Md.) Coals for Steaming, etc.

ORDERS RECEIVED FOR AND FILLED by J. COWLES, 37 Wall St., N. Y.

George O. Robertson,

Broker in Scotch and American Pig Iron;

Bar Iron, Lead, Spelter, Tin, Copper, etc.,
NO. 4 LIBERTY PLACE, MAIDEN LANE,
(Near Broadway,) NEW YORK

DUNLAP'S HOTEL,

On the European Plan,
NO. 135 FULTON STREET,
Between Broadway and Nassau St.,
NEW YORK.

Manufacture of Patent Wire ROPE AND CABLES,

For Inclined Planes, Suspension Bridges, Standing Rigging, Mines, Cranes, Derrick, Tilters, &c., by JOHN A. ROEBLING, Civil Engineer, TRENTON, N. J.

Samuel D. Willmott, MERCHANT, AND MANUFACTURER OF CAST STEEL WARRANTED SAWS,

IMPORTER OF THE GENUINE WICKESLY GRINDSTONES,
NO. 8 LIBERTY STREET,
NEW YORK.

Doremus & Harris, ANALYTICAL & CONSULTING CHEMISTS, 179 BROADWAY, NEW YORK. SCHOOL OF CHEMISTRY.

Dudley B. Fuller & Co., IRON COMMISSION MERCHANTS, No. 139 GREENWICH STREET, NEW YORK.

Manning & Lee, GENERAL COMMISSION MERCHANTS, NO. 51 EXCHANGE PLACE, BALTIMORE.

Agents for Avalon Railroad Iron and Nail Works. Maryland Mining Company's Cumberland Coal 'CED'—Potomac and other good brands of Pig Iron.

Railroad Car Manufacturer's Furnishing Store.

[F. S. & S. A. MARTINE,

IMPORTERS AND MANUFACTURERS OF

RAIL ROAD CAR & CARRIAGE LININGS,

PLUSHES, CURTAIN MATERIALS, ETC.,
112 WILLIAM ST., NEAR JOHN.

3-4 and 6-4 Damasks, Union and Worsted; Moreens, Rattinets, Cloths, Silk and Cotton Velvets, English Bunting

Walter R. Johnson,

CIVIL AND MINING ENGINEER AND ATTORNEY for Patents. Office and Laboratory, F St., opposite the Patent office, Washington, D. C.

S. W. Hill,

Mining Engineer and Surveyor, Eagle River, Lake Superior.

[Starks & Pruyn,

MANUFACTURERS OF ALL KINDS OF
STEAM BOILERS,

52 and 54 Liberty, corner of Pruyn street

Nathan Starks, **ALBANY** Special Partner
Wm. F. Pruyn, R. H. Pruyn.
Iron Railing, Bank and Vault Doors, Iron Shutters
Bridge and Roof Bolts, Heavy Jobbing and Forging
of all kinds.

For particulars see Adv. in another column.

To Engineers and Surveyors.

E. BROWN AND SON Mathematical inst. makers No. 27 Fulton Slip, New York, make and keep for sale, Theodolites, Levelling inst., Levelling rods, Surveyors Compasses, and Chains, Cases of Mathematical drawing insts. various qualities, together with a general assortment of Ivory Scales and small insts. generally used by Engineers.

Samuel Kimber & Co.,

COMMISSION MERCHANTS
WILLOW ST. WHARVES, PHILADELPHIA.

AGENTS for the sale of Charcoal and Anthracite
Pig Iron, Hammered Railroad Car and Locomotive Axles, Force Pumps of the most approved construction for Railroad Water Stations and Hydraulic Rams, etc., etc.

July 27, 1849.

James Herron, Civil Engineer,

OF THE UNITED STATES NAVY YARD,
PENSACOLA, FLORIDA.

PATENTEE OF THE

HERRON RAILWAY TRACK.

Models of this Track, on the most improved plans, may be seen at the Engineer's office of the New York and Erie Railroad.

To Railroad Companies.

—WROUGHT IRON WHEELS—

SAFETY AND ECONOMY.

**NORRIS' LOCOMOTIVE WORKS,
SCHENECTADY, NEW YORK,**

Are Manufacturing Wrought Iron Driving, Truck, Tender, and Car Wheels—made from the best American Iron. Address **E. S. NORRIS.**

May 16, 1849.

Machinery Warehouse.

S. C. HILLS, No. 43 Fulton street, New York, has constantly for sale Steam Engines, Boilers, Lathes, Chucks, Drills, Planers, Force and Suction Pumps; Tenoning, Morticing and Boring Machines, Shingle Machines, Bolt and Nut Machines, Belting, Oil, Iron and Lead Pipe; Rubber, Percha and Leather Hose, &c., &c.

S. C. H.'s arrangements with several machine shops are such that he can supply, at very short notice, large quantities of machinery.

November 23, 1849.

Cruse & Burke,

Civil Engineers, Architects and Surveyors,
Office, New York State Institution of Civil Engineers,
STATE HALL, ALBANY, N. Y.

Drawings, specifications and surveys accurately executed. Pupils instructed theoretically and practically at a moderate premium.

May 26, 1849.

Eaton, Gilbert & Co.,

Railroad Car, Coach and Omnibus Builders,
TROY, N. Y.

**Hudson River Foundry,
THOMAS & COLLINS,**

130 Quay Street, Albany.

To Railroad & Navigation Cos.

Mr. M. BUTT HEWSON, *Civil Engineer*, offers his services to Companies about to carry out the surveys or works of a line of Navigation or Railroad. He can give satisfactory references in New York City as to his professional qualifications; and will therefore merely refer here to the fact of his having been engaged for upwards of two years conducting important Public Works for the British Government.

Communications will find Mr. Hewson at the office of the Railroad Journal, 54 Wall Street, New York.

Alfred W. Craven,

Chief Engineer Croton Aqueduct, New York.

Cop Waste.

CLEAN COP WASTE, suitable for cleaning Railroad, Steamboat and Stationary Engines, constantly on hand and for sale by

KENNEDY & GELSTON,

54 Pine St., New York.

October 27, 1849,

3m

IRON.

Iron.

Pig Iron, Anthracite and Charcoal; Boiler and Flue Iron, Spring and Blistered Steel, Nail Rods, Best Refined Bar Iron, Railroad Iron, Car Axles, Nails, Stove Castings, Cast Iron Pipes of all sizes, Railway Chairs of approved patterns for sale by

COLEMAN, KELTON & CABELL,
109 N. Water St., Philadelphia.

TRONDALE PIG METAL, MANUFACTURED

and for sale by the Bloomsburg Railroad Iron Co.
DUDLEY FISHER, Treasurer.
75 N. Water St., Philadelphia.

Railroad Iron.

500 Tons, afloat, weighing 57 pounds per lineal yard, for sale by

COLLINS, VOSE & CO.,

158 South St.

New York, November 17, 1849.

1m46

Railroad Iron.

THE Undersigned, Agents for Manufacturers, are prepared to contract to deliver Rails of superior quality, and of any size or pattern, to any ports of discharge in the United States.

COLLINS, VOSE & CO.,

158 South St.

New York, November 17, 1849.

Railroad Iron.

1600 Tons, weighing 60½ lbs. per yard.

185 " " 57½ "

580 " " 53 "

of the latest and most approved patterns. For sale by

BOORMAN, JOHNSTON & CO.,

119 Greenwich street.

New York, Oct. 13, 1849.

Railroad Iron.

THE Undersigned have on hand, ready for immediate delivery, various patterns of Iron Rails, of best English make, and manufactured in conformity with special specifications.

They offer also to import and contract to deliver ahead—on favorable terms.

DAVIS, BROOKS, & CO.,

68 Broad street.

New York, Oct. 11, 1849,

Drawings and Patterns of the most approved Rail—and specifications of quality and make of same, are on hand at their office, for examination of parties who may desire to inspect the same. **D., B. & Co.**
Oct. 11, 1849.

CUT NAILS OF BEST QUALITY, BAR IRON
(including Flat Rails) manufactured and for sale by
FISHER, MORGAN & CO.,
75 N. Water St., Philadelphia.

Glendon Refined Iron.

Round Iron, Band Iron, Hoop Iron,
Square " Flat " Scroll "

Axles, Locomotive Tyres,

Manufactured at the Glendon Mills, East Boston, for sale by

GEORGE GARDNER & CO.,

5 Liberty Square, Boston, Mass.

Sept. 15, 1849.

3m37

PATENT HAMMERED RAILROAD, SHIP & BOAT SPIKES.—The Albany Iron Works have always on hand, of their own manufacture, a large assortment of Railroad, Ship and Boat Spikes from 2 to 12 inches in length, and of any form of head; From the excellence of the material always used in their manufacture, and their very general use for railroads and other purposes in this country, the manufacturers have no hesitation in warranting them fully equal to the best spikes in market, both as to quality and appearance. All orders addressed to the subscribers at the works will be promptly executed.

JOHN F. WINSLOW, Agent.

Albany Iron and Nail Works, Troy, N. Y.

The above Spikes may be had at factory prices, of Erastus Corning & Co Albany; Meritt & Co., New York; E. Pratt & Brother, Baltimore, Md.

LAP—WELDED WROUGHT IRON TUBES

FOR

TUBULAR BOILERS,

FROM 1 1-2 TO 8 INCHES DIAMETER.

These are the ONLY Tubes of the same quality and manufacture as those so extensively used in England, Scotland, France and Germany, for Locomotive, Marine and other Steam Engine Boilers

THOMAS PROSSER,

Patentee.

28 Platt street, New York.

Railroad Iron.

THE UNDERSIGNED ARE PREPARED TO contract for the delivery of English Railroad Iron of favorite brands, during the Spring. They also receive orders for the importation of Pig, Bar, Sheet, etc. Iron.

THOMAS B. SANDS & CO.,

22 South William street,

February 3, 1849.

New York.

Iron Store.

THE Subscribers, having the selling agency of the following named Rolling Mills, viz: Norristown, Rough and Ready, Kensington, Triadelphia, Pottsgrove and Thorndale, can supply Railroad Companies, Merchants and others, at the wholesale mill prices for bars of all sizes, sheets cut to order as large as 58 in. diameter; Railroad Iron, domestic and foreign; Locomotive tire welded to given size; Chairs and Spikes; Iron for shafting, locomotive and general machinery purposes; Cast, Shear, Blister and Spring Steel; Boiler rivets; Copper; Pig iron, etc., etc.

MORRIS, JONES & CO.,

Iron Merchants,

Schuylkill 7th and Market Sts., Philadelphia.
August 16, 1849. 1y33

Railroad Iron.

THE MOUNT SAVAGE IRON WORKS, Alleghany county, Maryland, having recently passed into the hands of new proprietors, are now prepared, with increased facilities, to execute orders for any of the various patterns of Railroad Iron. Communications addressed to either of the subscribers will have prompt attention. **J. F. WINSLOW, President**

Troy, N. Y.

ERASTUS CORNING, Albany.

WARREN DELANO, Jr., N. Y.

JOHN M. FORBES, Boston.

ENOCH PRATT, Baltimore, Md.

November 6, 1848.

Railroad Iron.

THE SUBSCRIBERS ARE PREPARED TO take orders for Railroad Iron to be made at their Phoenix Iron Works, situated on the Schuylkill River, near this city, and at their Safe Harbor Iron Works, situated in Lancaster County, on the Susquehanna river; which two establishments are now turning out upwards of 1800 tons of finished rails per month. Companies desirous of contracting will be promptly supplied with rails of any required pattern, and of the very best quality.

REEVES, BUCK & CO.,

45 North Water St., Philadelphia.

March 15, 1849.

Monument Foundry.

A. & W. DENMEAD & SON,
Corner of North and Monument Sts.,—Baltimore,
HAVING THEIR

IRON FOUNDRY AND MACHINE SHOP

In complete operation, are prepared to execute faithfully and promptly, orders for Locomotive or Stationary Steam Engines, Woolen, Cotton, Flour, Rice, Sugar Grist, or Saw Mills,

Slide, Hand or Chuck Lathes, Machinery for cutting all kinds of Gearing, Hydraulic, Tobacco and other Presses, Car and Locomotive patent Ring Wheels, warranted,

Bridge and Mill Castings of every description, Gas and Water Pipes of all sizes, warranted, Railroad Wheels with best faggotted axle, furnished and futed up for use, complete

Being provided with Heavy Lathes for Boring and Turning Screws, Cylinders, etc., we can furnish them of any pitch, length or pattern.

Old Machinery Renewed or Repaired—and Estimates for Work in any part of the United States furnished at short notice.

June 8, 1849.

Iron Wire.

REFINED IRON WIRE OF ALL KINDS,
Card, Reed, Cotton-flyer, Annealed, Broom, Buckle, and Spring Wire. Also all kinds of Round, Flat or Oval Wire, best adapted to various machine purposes, annealed and tempered, straightened and cut any length, manufactured and sold by

ICHABOD WASHBURN.

Worcester, Mass., May 25, 1849.

American and Foreign Iron.**FOR SALE,**

300 Tons A 1, Iron Dale Foundry Iron.
100 " 1, " " " "
100 " 2, " " " "
100 " " Forge " "
400 " Wilkesbarre " "
100 " "Roaring Run" Foundry Iron.
300 " Fort " "
50 " Catoctin " "
250 " Chikiswalungo " "
50 " "Columbia" "chilling" iron, a very superior article for car wheels.
75 " "Columbia" refined boiler blooms.
30 " 1 x 1/2 Slit iron.
50 " Best Penna. boiler iron.
50 " "Puddled" " "
50 " Bagnall & Sons refined bar iron.
50 " Common bar iron.

Locomotive and other boiler iron furnished to order.

GOODHUE & CO.,

New York.

64 South street

American Pig, Bloom and Boiler Iron.

HENRY THOMPSON & SON,
No 57 South Gay St., Baltimore, Md.,
Offer for sale, Hot Blast Charcoal Pig Iron made at the Catoctin (Maryland), and Taylor (Virginia), Furnaces; Cold Blast Charcoal Pig Iron from the Cloverdale and Catawba, Va., Furnaces, suitable for Wheels or Machinery requiring extra strength; also Boiler and Flue Iron from the mills of Edge & Hilles in Delaware, and best quality Boiler Blooms made from Cold Blast Pig Iron at the Shenandoah Works, Va. The productions of the above establishments can always be had at the lowest market prices for approved paper.

American Pig Iron of other brands, and Rolled and Hammered Bar Iron furnished at lowest prices. Agents for Watson's Perth Amboy Fire Bricks, and Rich & Cos. New York Salamander Iron Cheats. Baltimore, June 14, 1849. 6 mos

LAP-WELDED WROUGHT IRON TUBES
for Tubular Boilers, from 1 1/2 to 15 inches diameter, and any length not exceeding 17 feet—manufactured by the Caledonian Tube Company, Glasgow, and for sale by

IRVING VAN WART,
12 Platt street, New York.

JOB CUTLER, Patentes.

These Tubes are extensively used by the British Government, and by the principal Engineers and Steam Marine and Railway Companies in the Kingdom.

Railroad Iron.

THE TRENTON IRON COMPANY ARE NOW turning out one thousand tons of rails per month, at their works at Trenton, N. J. They are prepared to enter into contract to furnish rails of any pattern, and of the very best quality, made exclusively from the famous Andover iron. The position of the works on the Delaware river, the Delaware and Raritan canal, and the Camden and Amboy railroad, enables them to ship rails at all seasons of the year. Apply to

COOPER & HEWITT, Agents.

October 30, 1848. 17 Burling Slip, New York.

Pig and Bloom Iron.

THE SUBSCRIBERS ARE AGENTS for the sale of numerous brands of Charcoal and Anthracite Pig Iron, suitable for Machinery, Railroad Wheels, Chains, Hollowware, etc. Also several brands of the best Puddling Iron, Juniata Blooms suitable for Wire, Boiler Plate, Axe Iron, Shovels, etc. The attention of those engaged in the manufacture of Iron is solicited by

A. WRIGHT & NEPHEW,
Vine Street Wharf, Philadelphia.

Iron.

THE SUBSCRIBERS having resumed the agency of the New-Jersey Iron Company, are prepared to execute orders for the different kinds and sizes of iron usually made at the works of the company, and offer for sale on advantageous terms.—

150 tons No. 1 Boonton Foundry Pig Iron.

100 " No. 2 do. do. do.

300 " Nos. 2 & 3 Forge do. do.

100 " No. 2 Glendon do. do.

140 " Nos. 2 & 3 Lehigh Crane do. do.

100 " No. 1 Pompton Charcoal do.

100 " New-Jersey Blooms

50 " New-Jersey Faggotted Iron, for shafts

Best Bars, 1/2 to 4 inch by 1/2 to 1 inch thick.

Do do Rounds and Squares, 1/2 to 3 inch.

Rounds and Squares, 3-16 to 1 inch.

Half Rounds, 1/2 to 1 in. Ovals & Half Ovals 1/2 to 1 1/2 in.

Bands, 1 1/2 to 4 inch. Hoops, 1/2 to 2 inch.

Trunk Hoops, 1/2 to 1 1/2 in. Horse Shoe & Nut Iron.

Nail Plates, Railroad Spikes.

DUDLEY B. FULLER & Co., 139 Greenwich-st. and 85 Broad-st.

WILLIAM JESSOP & SONS' CELEBRATED CAST-STEEL.

The subscribers have on hand, and are constantly receiving from their manufactory.

PARK WORKS, SHEFFIELD.

Double Refined Cast Steel—square, flat and octagon. Best warranted Cast Steel—square, flat and octagon.

Best double and single Shear Steel—warranted.

Machinery Steel—round.

Best and 2d gy. Sheet Steel—for saws and other purposes.

German Steel—flat and square, "W. I. & S." "Eagle" and "Goat" stamps.

Genuine "Sykes," L Blister Steel.

Best English Blister Steel, etc., etc., etc.

All of which are offered for sale on the most favorable terms by

WM. JESSOP & SONS,

91 John street, New York.

Also by their Agents—

Curtis & Hand, 47 Commerce street, Philadelphia.

Alex'r Fullerton & Co., 119 Milk street, Boston.

Stickney & Beatty, South Charles street, Baltimore.

May 6, 1848.

SPRING STEEL FOR LOCOMOTIVES, TENDERS AND CARS.

The subscriber is engaged in manufacturing spring steel from 1 1/2 to 6 inches in width, and of any thickness required: large quantities are yearly furnished for railroad purposes, and wherever used its quality has been approved of. The establishment being large, can execute orders with great promptitude, at reasonable prices, and the quality warranted. Address

J. F. WINSLOW, Agent,

Albany Iron and Nail Works.

JOHNSON, CAMMELL & Co's Celebrated Cast Steel,

AND ENGINEERING AND MACHINE FILES, which for quality and adaptation to mechanical uses, have been proved superior to any in the United States. Every description of square, octagon, flat and round cast steel, sheet, shovel and railway spring steel, best double and single shear steel, German steel, flat and square, goat stamps, etc. Saw and file steel, and steel to order for any purposes, manufactured at their Cyclops Steel Works Sheffield.

JOHNSON, CAMMELL & CO.,

100 William St., New York.

November 23 1849.

American Cast Steel.

THE ADIRONDAC STEEL MANUFACTURING CO. is now producing, from American iron, at their works at Jersey City, N. J., Cast Steel of extraordinary quality, and is prepared to supply orders for the same at prices below that of the imported article of like quality. Consumers will find it to their interest to give this a trial. Orders for all sizes of hammered cast steel, directed as above, will meet with prompt attention.

May 28, 1849.

To Steam Engine Builders.

THE Undersigned offer for sale, at less than half its cost, the following new machinery, calculated for an engine of 62 inches cylinder and 10 feet stroke, viz:

2 Wrought Iron Cranks, 60 inches from centre to centre.

1 Do. do. Connecting Rod Strap.

2 Do. do. Crank Pins.

1 Eccentric Strap.

1 Diagonal Link with Brasses.

1 Cast Iron Lever Beam (forked).

The above machinery was made at the West Point Foundry for the U. S. Steamer Missouri, without regard to expense, is all finished complete for putting together, and has never been used. Drawings of the cranks can be seen on application to

HENRY THOMPSON & SON,

No. 57 South Gay St., Baltimore, Md.

Sept. 12, 1849.

Railroad Instruments.

THEODOLITES, TRANSIT COMPASSES, and Levels, with Fraunhofers Munich Glasses, Surveyor's Compasses, Chains, Drawing Instruments, Barometers, etc., all of the best quality and workmanship, for sale at unusually low prices, by

E. & G. W. BLUNT,

No. 179 Water St., cor. Burling Slip.

New York, May 19, 1849.

Mattewan Machine Works.

THE Mattewan Company have added to their Machine Works an extensive Locomotive Engine department, and are prepared to execute orders for Locomotive Engines of every size and pattern—also Tenders, Wheels, Axles, and other railroad machinery, to which they ask the attention of those who wish such articles, before they purchase elsewhere.

STATIONARY ENGINES, BOILERS, ETC., Of any required size or pattern, arranged for driving Cotton, Woolen, or other Mills, can be had on favorable terms, and at short notice.

COTTON AND WOOLLEN MACHINERY, Of every description, embodying all the modern improvements, second in quality to none in this or any other country, made to order.

MILL GEARING,

Of every description, may be had at short notice, as this company has probably the most extensive assortment of patterns in this line, in any section of the country, and are constantly adding to them.

TOOLS.

Turning Lathes, Slabbing, Planing, Cutting and Drilling Machines, of the most approved patterns, together with all other tools required in machine shops, may be had at the Mattewan Company's Shops, Fishkill Landing, or at 39 Pine street, New York.

WM. B. LEONARD, Agent.

NOTICE.

TO BRIDGE BUILDERS, BRIDGE COMPANIES, and Other Individuals and Associations, who have constructed or used Bridges involving the combined principle of Bracing, Counter-bracing and Trussing by means of counteracting braces, keys, wedges, screws, etc., as set forth and explained in my Bridge Patent of 1830, in the words following, to wit: "A system of Counter-bracing, by means of which the truss frames are rendered stiff and unyielding, and the bridge kept in uniform action whether loaded or unloaded"—NOTICE is hereby given, that in all cases in which said combined principle has been introduced into bridges, without due license or authority from me, and without my having been duly remunerated therefor, will be regarded as infringements upon my rights and privileges, and that an amicable adjustment and settlement of all my claims in the premises may be effected by prompt application to my duly authorized Agents therefor, viz: Messrs. Clinton, Knight and Brother, of Cincinnati, Ohio, or Daniel A. Webster, Esq., 8 Pell street of the city of New York.

STEPHEN H. LONG, Patentes.

Louisville, December 10, 1849.

To Railroad Companies.

FOR SALE—A Second-hand Locomotive Engine and Tender, of about 10 tons weight, in good order, and *accustomed to perform well.* Any company wanting a cheap engine for a passenger or light burden train, will rarely meet with an opportunity so favorable as the present. The engine and tender are in perfect running order, and will be tested to the satisfaction of any one wishing to purchase. Price \$1,500.

Address **J. B. MOORHEAD,**
Frazer P.O., Chester county, Pa.

P.S.—The Engine can be seen by calling on H. Osmond & Co., Car-builders, Broad st., Philadelphia.
September 6, 1849.

India-rubber for Railroad Cos.

RUBBER SPRINGS—*Bearing and Buffer—Fuller's Patent*—Hose from 1 to 12 inches diameter. Suction Hose. *Steam Packing*—from 1-16 to 2 in. thick. *Rubber and Gutta Percha Bands.* These articles are all warranted to give satisfaction, made under Tyer & Helm's patent, issued January, 1849.—No lead used in the composition. Will stand much higher heat than that called "Goodyear's," and is in all respects better than any in use. Proprietors of railroads do not be overcharged by pretenders.

HORACE H. DAY,
Warehouse 23 Courtlandt street.

New York, May 21, 1849.

Fire Brick.

THE Subscribers have constantly on hand Rafford's Stourbridge, Oak Farms Stourbridge, Lister, Wortley, Red and White Welsh Fire Bricks, common and fancy shapes. Also,

ROOFING SLATES,

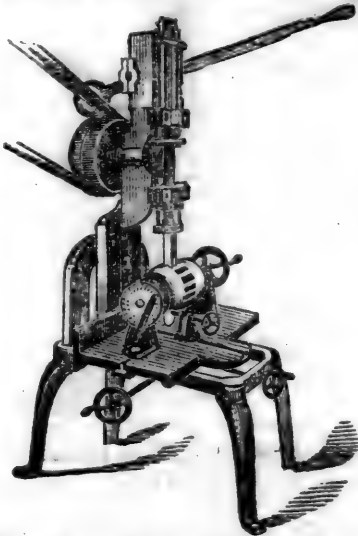
from the best Welch quarries, and of all sizes. Also, **COAL,**
of all kinds—Liverpool Orrell and Cannel, Scotch, New Castle, Pictou, Sidney, Cumberland, Virginia, and all kinds of Anthracite coals. Also,

Pig Iron, Salt, etc., etc., for sale at the lowest market price. Apply to

SAMUEL THOMPSON & NEPHEW,
275 Pearl and 43 Gold Sts., New York.

November, 23, 1849.

**Capt. Alfred Swingle's
PATENT BORING
& MORTISING MACHINE.**



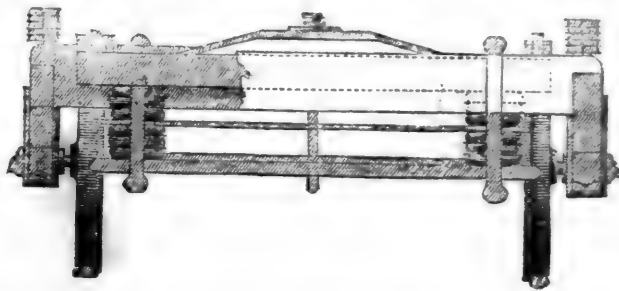
The above Machine was invented by A. SWINGLE, of Texas, in 1846, and Letters Patent were taken out in July, 1848. As a labor saving Machine it stands unrivalled even in these days of improvements. Its uses are innumerable; it may be successfully applied to Doors, Sashes, Carriages, Wheel-Hubs, and in fact to all kinds of work where the Auger and Chisel can be brought to bear.

The only limit to the speed of the working of this machine is the heating of the tools used. It will perform at least the labor of twelve men, and in vastly better manner, and can be worked equally well by steam power or by hand. It has been used and has given universal satisfaction.

For further information apply to H. B. TENNENT, 40 Wall St., New York, to whom all orders are to be addressed.

New York, December 15, 1849.

**FULLER'S PATENT
INDIA RUBBER CAR SPRINGS.**



RAILROAD COMPANIES are cautioned, before purchasing Springs, to examine the actual patents and judge for themselves.

Persons, under the Title of the New England Car Company, seeking fraudulently to invade Fuller's rights have put forth so many statements for the purpose of misleading the public, that an enumeration of some facts is absolutely necessary, for the purpose of putting persons interested upon their guard.

Fuller's patent is for the application of Discs of India-rubber with Metal Plates, for forming Springs for Railway Cars and Carriages—either one disc and two plates, or ten discs and plates, or any other number, are equally covered by the patent. Fuller is not bound to the use of short discs—he may use long discs and plates.

Ray's patent is simply and wholly the forming of air tight rubber cylinders, with hoops or bands round the outside, and the combination of elasticity of India rubber, with the elasticity of atmospheric air confined in the cylinder, and in no part of his patent is he authorized to use the form of spring which he is now fraudulently supplying to Railroad Companies. Such springs are direct and positive infringements of the very letter of Fuller's patent.

Fuller's patent is dated October, 1845, Ray's patent, August, 1848.

The spring patented by Ray never has been put in operation, and never can be made useful for Railroad cars.

A mere experiment, even if made, it is well known does not prove an invention; and it is ridiculous for such parties to hope to mislead the Presidents and Superintendents of Railroad companies, by claiming the invention because Ray alleges he made an experiment—which Fuller had made before him—had actually brought into working order, and obtained a patent for—and this too before Mr. Ray states he made his experiment—and that experiment not claimed to have been applied to a car or carriage.

Besides, the invention could not have been developed until India rubber, properly Vulcanised, could be made of a sufficient thickness. In the United States the art of vulcanising rubber by steam heat, (by which

means only can a body of rubber having any considerable thickness be vulcanised,) was not introduced until after the grant by the American government of the patent for springs to Fuller—whereas the process of vulcanising rubber by steam heat was invented in England about three years previously, and was used by Fuller there. This fact refutes entirely the claim of invention put forth by Mr. Ray, and proves the impossibility of his pretensions being true.

Fuller was the first and only inventor of the spring. A Mr. Dorf, whose connection with Mr. Goodyear is well known in this country, applied in England to Mr. Fuller, after he had published and patented his invention, and introduced another party for the purpose of obtaining the agency for the United States. They were furnished with a complete set of drawings and models, and with instructions to make arrangements for the supply of material of American manufacture—from that hour to the present not a single communication has been received from them. Some of these identical models have been traced into the hands of parties now seeking to invade Fuller's rights, and who have exhibited them as specimens of their own invention.

After this, the conveyance was made by Goodyear to certain parties here for the use for railroad springs of what he calls his Metallic rubber. Comment is unnecessary.

There are 5 or 6 different processes for the manufacture of vulcanised rubber, patented by as many different parties, some here, some in England, either of which would probably make good springs.

A large and powerful company has been organised under Fuller's patent, the particulars of which shall be given very shortly.

An action has been commenced against three railroad companies for infringement; and all other parties will assuredly be prosecuted if they continue farther to infringe upon Fuller's patent.

W. C. FULLER,

The only persons authorised to supply the Springs are
G. M. KNEVITT, 38 Broadway, N. York,
General Agent for the U. S.; and
JAS. LEE & Co., 13 India Wharf, Boston.
JOHN THORNLEY, Chestnut st., Philad.

**Arch St. Machine Shop.
BIRKENBINE, MARTIN & TROTTER,**

Makers of

STEAM ENGINES,

and

HYDRAULIC MACHINERY,

NO. 16 ARCH STREET,
PHILADELPHIA.

Will construct Steam Engines, Pumps, for Draining Mines and Land; supplying Water to Towns, Factories, Farms, etc;

Also, Street Stops, Fire Plugs, Water Tanks, and Hydraulic Rams, with

(BIRKENBINE'S PATENT VALVES.)
B., M. & T. contract for Warming and Ventilating Buildings by Steam or Warm Water.

J. E. Mitchell,

NO. 14 OLD YORK ROAD, PHILADELPHIA.

Importer and manufacturer of

New Castle

Nova Scotia

Wickersly

French Burr

Cocahoe

Cologne

American and

Patent compressed

Garnkirk

Grindstones, of all sizes and grits.

Millstones, made to order, with all the recent improvements.

Fire Bricks and Tiles of various sizes.

Burr Blocks, Bolting Cloths, Mill Irons, etc.

**To the Proprietors of Rolling
Mills and Iron Works.**

THE Undersigned—Proprietors of Townsend's Furnace and Machine Shop, Albany—are extensively engaged in the manufacture of Machinery and fixtures for Iron, and Copper Rolling Mills, and Iron Works. Having paid particular attention to the manufacture of *Rolls (Rollers)*, both *chilled* and *dry-sand*, they feel confident that they can execute orders for such castings in a satisfactory manner. And to give assurance of this, they beg leave to refer to the following named persons, proprietors and managers of some of the most extensive rolling mills in the country, viz: Jno. F. Winslow, J. Tuckerman, H. Burden, W. Burt, J. & J. Rogers, Salrus & Co., J. B. Bailey, L. G. B. Cannon, Hawkins & Atwater, etc., etc.

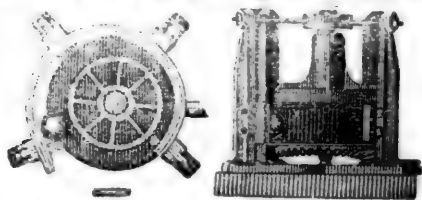
F. & T. TOWNSEND.

Albany, August 19, 1849.

Steam Boiler Explosions.

THE Subscriber having been appointed sole Agent for Faber's Magnetic Water Gauge, is now ready to supply the trade, and also individuals with this celebrated instrument. Besides the greatest safety from explosion resulting from its use, it is a thorough check against careless stoking and feeding. In marine engines it will regulate the exact quantity required in the "blow off." Pamphlets containing full information, can be had free on application to the Agent

JOSEPH P. PIRSSON,
Civil Engineer, 5 Wall st.

MACHINERY.**Henry Burden's Patent Revolving Shingling Machine.**

THE Subscriber having recently purchased the right of this machine for the United States, now offers to make transfers of the right to run said machine, or sell to those who may be desirous to purchase the right for one or more of the States.

This machine is now in successful operation in ten or twelve iron works in and about the vicinity of Pittsburgh, also at Phoenixville and Reading, Pa., Covington Iron Works, Md., Troy Rolling Mills, and Troy Iron and Nail Factory, Troy, N. Y., where it has given universal satisfaction.

Its advantages over the ordinary Forge Hammer are numerous: considerable saving in first cost; saving in power; the entire saving of shingler's, or hammerman's wages, as no attendance whatever is necessary, it being entirely self-acting; saving in time from the quantity of work done, as one machine is capable of working the iron from sixty puddling furnaces; saving of waste, as nothing but the scoria is thrown off, and that most effectually; saving of staffs, as none are used or required. The time required to furnish a bloom being only about six seconds, the scoria has no time to set, consequently is got rid of much easier than when allowed to congeal as under the hammer. The iron being discharged from the machine so hot, rolls better and is much easier on the rollers and machinery. The bars roll rounder, and are much better finished. The subscriber feels confident that persons who will examine for themselves the machinery in operation, will find it possesses more advantages than have been enumerated. For further particulars address the subscriber at Troy, N. Y.

P. A. BURDEN.

Railroad Spikes and Wrought Iron Fastenings.

THE TROY IRON AND NAIL FACTORY, exclusive owner of all Henry Burden's Patented Machinery for making Spikes, have facilities for manufacturing large quantities upon short notice, and of a quality unsurpassed.

Wrought Iron Chairs, Clamps, Keys and Bolts for Railroad fastenings, also made to order. A full assortment of Ship and Boat Spikes always on hand.

All orders addressed to the Agent at the Factory will receive immediate attention.

P. A. BURDEN, Agent,
Troy Iron and Nail Factory, Troy, N. Y.

RAILROAD WHEELS.

CHILLED RAILROAD WHEELS.—THE Undersigned are now prepared to manufacture their Improved Corrugated Car Wheels, or Wheels with any form of spokes or discs, by a new process which prevents all strain on the metal, such as is produced in all other chilled wheels, by the manner of casting and cooling. By this new method of manufacture, the hubs of all kinds of wheels may be made whole—that is, without dividing them into sections—thus rendering the expense of banding unnecessary; and the wheels subjected to this process will be much stronger than those of the same size and weight, when made in the ordinary way.

A. WHITNEY & SON,
Willow St., below 13th,
Philadelphia, Pa.

CHILLED RAILROAD WHEELS.—THE Undersigned, the Original Inventor of the Plate Wheel with solid hub, is prepared to execute all orders for the same, promptly and faithfully, and solicits a share of the patronage for those kind of wheels which are now so much preferred, and which he originally produced after a large expenditure of time and money.

A. TIERS,
Point Pleasant Foundry.

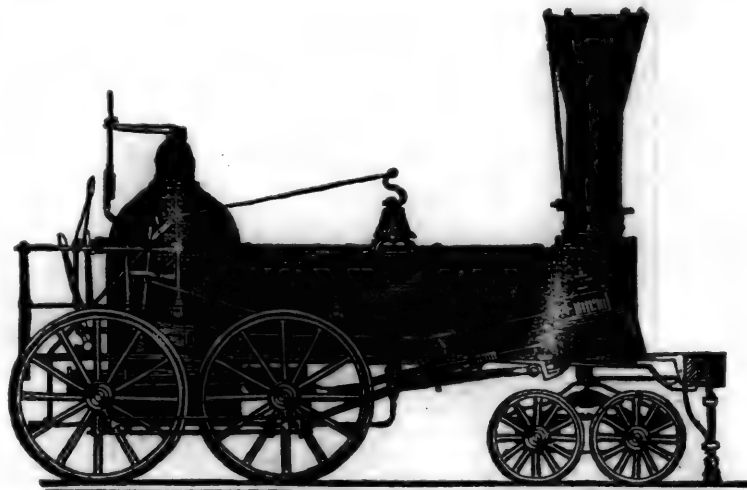
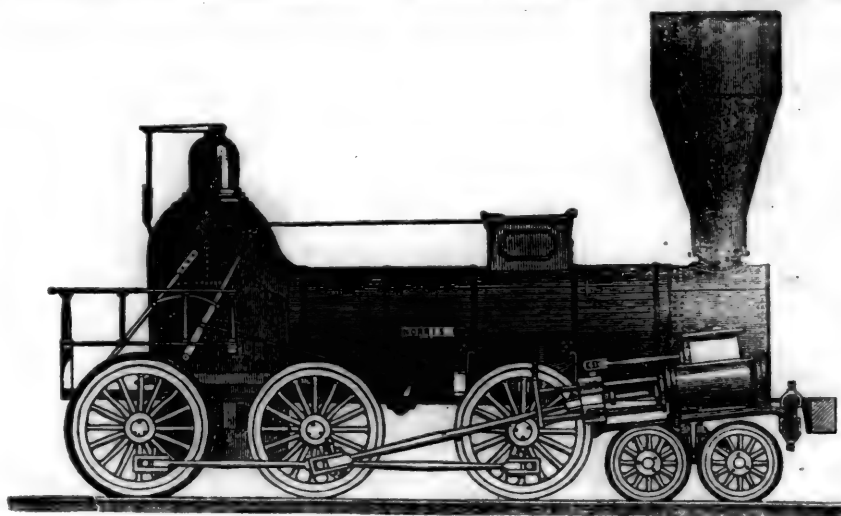
He also offers to furnish Rolling Mill Castings, and other Mill Gearing, with promptness, having, he believes, the largest stock of such patterns to be found in the country.

A. T.

Kensington, Philadelphia Co.,
March 12, 1848.

NORRIS' LOCOMOTIVE WORKS.

BUSHHILL, SCHUYLKILL SIXTH-ST., PHILADELPHIA,



THE UNDERSIGNED Manufacture to order Locomotive Steam Engines of any plan or size. Their shops being enlarged, and their arrangements considerably extended to facilitate the speedy execution of work in this branch, they can offer to Railway Companies unusual advantages for prompt delivery of Machinery of superior workmanship and finish.

Connected with the Locomotive business, they are also prepared to furnish, at short notice, Chilled Wheels for Cars of superior quality.

Wrought Iron Tyres made of any required size—the exact diameter of the Wheel Centre, being given, the Tyres are made to fit on same without the necessity of turning out inside.

Iron and Brass castings, Axles, etc., fitted up complete with Trucks or otherwise.

NORRIS, BROTHERS

LAWRENCE'S ROSENDALE HYDRAULIC Cement. This Cement is warranted equal to any manufactured in this country, and has been pronounced superior to Francis' "Roman." Its value for Aqueducts, Locks, Bridges, Flooms, and all Masonry exposed to dampness, is well known, as it sets immediately under water, and increases in solidity for years. For sale in lots to suit purchasers, in tight papered barrels, by

JOHN W. LAWRENCE,
142 Front-street, New York.

Orders for the above will be received and promptly attended to at this office. 32 ly.

PATENT MACHINE MADE HORSE-SHOES.

The Troy Iron and Nail Factory have always on hand a general assortment of Horse Shoes, made from Refined American Iron.

Four sizes being made, it will be well for those ordering to remember that the size of the shoe increases as the numbers—No. 1 being the smallest.



P. A. BURDEN, Agent,
Troy Iron and Nail Factory, Troy, N. Y.

Text Book of Mechanical Drawing,

FOR the use of SCHOOLS and SELF-INSTRUCTION, containing,
1st. A series of progressive practical problems in Geometry, with full explanations, couched in plain and simple terms; showing also the construction of the parallel ruler, plane scales and protractor.

2d. Examples for drawing plans, sections and elevations of Buildings and Machinery, the mode of drawing elevations from circular and polygonal plans, and the drawing of Roman and Grecian Mouldings.

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4th. A treatise on Linear Perspective, with numerous examples and full explanations, rendering the study of the art easy and agreeable.

5th. Examples for the projection of shadows.

The whole illustrated with 50 STEEL PLATES. Published by WM. MINIFIE & CO.,

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AMERICAN RAILROAD JOURNAL.

STEAM NAVIGATION, COMMERCE, MINING, MANUFACTURES.

HENRY V. POOR, Editor.

ESTABLISHED 1831.

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Mechanic Arts.*
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American Railroad Journal.

PUBLISHED BY J. H. SCHULTZ & CO., 136 NASSAU ST.

Saturday, February 2, 1850.

Additional Notes on Brooklyn Water Works.

Having written the remarks published in last week's number of the Journal on the water works of Brooklyn very hurriedly, I had been able to go into the question in only a very general way. I beg leave now to explain some of the leading points in the case more fully; and with this view will consider in the first instance, that the formation of Long Island is gravel to the level of the sea, and in the next, that an impervious bed intersects the island between the level of the surface and the level of the sea.

If the formation of Long Island be gravel to the level of the sea, the sea water, passing freely through a material so loose and porous, will always be found at that level; and therefore any wells or channels sunk in such stratum must necessarily communicate with the sea water. If those wells or channels be made water-tight to a level sufficiently high to prevent this communication, the case will stand in this

way: The water can never rise in the well above the level of the water-tight point, seeing that above this it must flow freely through the gravel sides to the sea water below. Besides, the wells, even though sunk to a great depth, cannot command a wide range of basin, inasmuch as the rain-fall being first received on an open formation, the absorption will naturally sink to the sea water underneath; and in consequence, no considerable amount of absorption can possibly rise in the wells, unless, perhaps, at periods of heavy rains.—While the water can descend vertically, it will not travel over an inclined plane.—Indeed, with water-tight sides to a certain height, it is quite plain that no water except that which falls on its own surface can enter the well until the whole formation of the island shall have become surcharged with water to the height of the water-tight sides. If, therefore, the formation be loose gravel to the level of the sea, the wells suggested cannot even when made staunch yield pure water; inasmuch as the only water that can enter must be the overflowing of a body of water in direct communication with the sea; and as this overflowing can take place only when the porous material of the island shall have been surcharged with absorption, the wells sunk in such a material can receive only a periodic supply, one that consequently must fall far short of the requirements of a city. These reasonings are a simple repetition of self-evident truths; but as many engineering errors may be traced to an oversight of the simplest facts, it is perhaps more prudent to detail those concerned in this case. I confess my inability to propose a good remedy for such a state of things; but as such a state seems very unlikely indeed, something practically useful may be done by considering the more probable conditions of the case.

Next, if an impervious plane intersect the island below the level of the surfaces, and above the level of the sea, there can be no doubt that the material above this plane being loose and open, a considerable proportion of the rain-shed must descend to this plane. This bed then is the surface by which we must be ruled in the case: the levels recommended to be taken across the island are useful so far only as they help in plotting from the borings the sections of this intermediate impervious bed. This under, or as it may be called secondary, surface will be found like the upper or primary surface, to consist of a series of valleys, or as they are termed by Engineers 'catchment basins;' these valleys or

basins receiving at their lowest level the proportion of rain-shed chargeable to the absorption of the soil, and converging as in the case of surface valleys on either one common point, or to several distinct points of lowest depression. If several of the valleys shown on the impervious layer combine as in the latter case in a common system by debouching as tributaries into one common valley, the point of lowest level in this common valley must evidently receive the water of the whole system.—In this case, if the area drained into this lowest level be of sufficient extent, a shaft or well tapping it must of course yield a sufficient supply;—and under such circumstances a shaft or well tapping this point is clearly the natural, and indeed the only effective means of supply. But if on the other hand these valleys discharge into the sea by distinct outlets, or if, as also is very likely, the section of the impervious bed should present two surfaces inclining from a ridge in or near the middle of the island to the sea on one side and to the sound on the other, a moment's reflection will show the imprudence of attempting to tap the absorption to any extent by a well or a series of wells. If each valley of the retentive surface discharge directly into the sea its own proportion of absorption over an incline dipping from the centre of the island towards either shore, the natural, and indeed the only means of supply lies in excavating through the impervious stratum contoured catchment-drains that shall intersect the line of lowest level within each valley, at a point on that line sufficiently elevated to admit of the proper gradient for the drain, the debouching point being maintained at a sufficient height above the sea. If the section of the retentive stratum should present an unbroken incline, dipping from the centre towards each coast, a simple catchment-drain cut along the sides of these two inclines and graduated in the same way as the more tortuous drains described, is also under such circumstances the natural and the only means of obtaining a full supply. The probabilities are strongly in favor of the supposition that one or other of the two last cases will be the result established by such a survey as was recommended in last week's Journal. To preserve the purity of the water, and also to save any interruption from slips or the like to the flow through the catchment-drains, it would be well to turn an arch over them: the retentive slopes and bottom will answer fully all the purposes of brickwork for the remainder of the

section. These channels should debouch into a reservoir, from which the water might be raised by steam to any level necessary for distribution.—They can never be overcharged, seeing that above the level of the retentive slopes, and below the springing of the arching, the loose gravel will act as a natural waste-gate; and on the other hand, if the supply from absorption alone should be found insufficient, a large amount of surface-water might be brought in by cutting a little higher up the slopes of the surface, open catchments thro' which surface-water might be made to communicate freely with the aqueduct.

No opinion is given here as to the superiority in the case of Brooklyn of either of these measures proposed; it even seems strange that the deliberative and far-seeing intellect which arranged so admirably a work of such magnificence as the Croton aqueduct, could have been in the case of the Brooklyn water works, somewhat hasty in his opinion.—The wells are the only means of supply, under one set of circumstances; the catchments are the only means of supply under a different set; and therefore it is quite impossible to pronounce intelligently on either one or the other as a means of supply, until a survey shall have established the circumstances of the particular case in question.

The liability to an improper location of either a well or a catchment-drain, apart from the necessity of proper sections of the substratum with the view of establishing the fitness of the one or the other means of supply, goes to show that such sections are equally necessary for the judicious location of the means that may be found adapted to any particular case. They are still further necessary for the purpose of estimating the probable amount of supply delivered at any one point; and consequently for ascertaining the extent of the works—in the one case the number of wells required to yield a given supply; in the other case the length of catchment-drains required to produce the same result.

The observations to be taken on the existing springs and water courses will be available in the first place as a collateral evidence of the accuracy of the results of the borings; and in the next place as a means, by comparison with the returns of the rain-gauge, of approximating to the amount of absorption. The smallest peculiarity connected with these may define a large and important series of facts; and these facts cannot fail to correct any errors that may be embodied in the view of the case furnished by the borings. Experience in works of this very peculiar class is absolutely necessary to ultimate success; experience only can catch at and follow out the minutie of evidence necessary to place the measures proposed on a clear, well-established footing.

The necessity for the fullest inquiry into all the particulars detailed in last week's number, and such other particulars as a very careful examination of the country will suggest to a man of skill, is urged here on the faith of a very considerable practice in designing and executing works of this nature. Until all the information necessary to convey a clear view of the whole conditions of the case, shall have been collected, any man of practical experience in such questions will decline to give an opinion as to the means of supply.—The survey necessary will doubtless cost a good deal of money; but without such a preliminary outlay, the whole cost of a rash system will most probably—perhaps I might say most certainly—fail to yield each citizen even a pint of wholesome water in the 24 hours.

M.B.H.

Statistics of Lowell Manufactures.

COMPILED FROM AUTHENTIC SOURCES.—JAN. 1850.

Incorporated.

Merrimack Manufacturing company	1822
Hamilton Manufacturing company	1825
Appleton company	1826
Lowell Manufacturing company	1828
Middlesex company	1830
Suffolk manufacturing company	1830
Tremont Mills	1830
Lawrence manufacturing company	1830
Lowell Bleachery	1833
Boott cotton mills	1835
Massachusetts cotton mills	1839
Lowell machine shop	1845

Commenced Operations.

Merrimack manuf. co.	1823
Hamilton manuf. co.	1825
Appleton co.	1826
Lowell manuf. co.	1826
Middlesex co.	1830
Suffolk manufacturing co.	1832
Tremont mills	1832
Lawrence manuf. co.	1833-34
Lowell bleachery	1832
Boott cotton mills	1836
Massachusetts cotton mills	1840
Lowell machine shop	1845

Capital Stock.

Merrimack manuf. co.	\$2,500,000
Hamilton manuf. co.	1,200,000
Appleton co.	600,000
Lowell manuf. co.	1,500,000
Middlesex co.	1,000,000
Suffolk manuf. co.	600,000
Tremont mills	600,000
Lawrence manuf. co.	1,500,000
Lowell bleachery	210,000
Boott cotton mills	1,200,000
Massachusetts cotton mills	1,800,000
Lowell machine shop	600,000

\$13,210,000

Number of Mills.

Merrimack manuf. co.	6 and Print works.
Hamilton	4
Appleton co.	2
Lowell manuf. co.	1 spinning, 1 carpet, 1 cotton.
Middlesex co.	4 and 3 dye houses.
Suffolk manuf. co.	3
Tremont mills	2
Lawrence manuf. co.	5
Lowell bleachery	Bleachery and dye-works.
Boott cotton mills	5
Massachusetts cotton mills	6
Lowell machine shop	2 shops, smithy & foundry.
Total, 50.	

Females Employed.

Merrimack manuf. co.	1,500
Hamilton manuf. co.	940
Appleton co.	400
Lowell manuf. co.	550
Middlesex co.	730
Suffolk manuf. co.	400
Tremont mills	400
Lawrence manuf. co.	1,200
Lowell bleachery	20
Boott cotton mills	870
Massachusetts	1,250
	8,260

Yards Made per Week.

Merrimack manuf. co.	310,000
Hamilton manuf. co.	200,000
Appleton co.	140,000
Lowell manuf. co.	12,000 carpet, 40 rugs, 95-000 cotton.
Middlesex co.	16,587 cassimere, 2,890 broad-cloth.
Suffolk manuf. co.	120,000
Tremont mills	140,000
Lawrence manuf. co.	260,000
Boott cotton mills	270,000
Massachusetts	475,000
40 rugs, 2,110,000 cotton, 20,477 woolen, 12,000 carpets—total yds.	2,142,477

Looms.

Merrimack manuf. co.	2,012
Hamilton manuf. co.	1,124
Appleton co.	600
Lowell manuf. co.	220 cotton, 124 power carpet.
Middlesex co.	75 broadcloth, 328 cassimere.
Suffolk manuf. co.	590
Tremont mills	557
Lawrence manuf. co.	1,364
Boott cotton mills	1,432
Massachusetts	1,459
	9,885

Spindles.

Merrimack manuf. co.	68,768
Hamilton manuf. co.	38,416
Appleton co.	17,920
Lowell manuf. co.	4,200 wool, 7,143 cotton—11,343
Middlesex co.	16,340
Suffolk manuf. co.	14,448
Tremont mills	14,560
Lawrence manuf. co.	44,800
Boott cotton mills	47,632
Massachusetts	45,720
	319,946

Males Employed.

Merrimack manuf. co.	645
Hamilton manuf. co.	367
Appleton co.	120
Lowell manuf. co.	325
Middlesex co.	575
Suffolk manuf. co.	100
Tremont mills	100
Lawrence manuf. co.	200
Lowell bleachery	263
Boott cotton mills—(including male tenders).	262
Massachusetts	250
Lowell machine shop	700
	3,744

Cotton Consumed per Week—lbs.

Merrimack manuf. co.	67,000
Hamilton manuf. co.	66,000
Appleton co.	50,000
Lowell manuf. co.	50,000
Suffolk manuf. co.	48,000
Tremont mills	42,000
Lawrence manuf. co.	95,000
Boott cotton mills	85,000
Massachusetts	150,000
Lowell machine shop, 4500 tons wrought and cast iron per annum.	653,000

Wool Consumed per Week—lbs.

Lowell manuf. co.	36,000
Middlesex co.	33,000
	69,000

Yards Dyed and Printed.

Merrimack manuf. co.	270,000
Hamilton manuf. co.	75,000 printed, 15,000 dyed.
Lowell bleachery	9,500,000 dyed.
Lowell machine shop, cotton and woolen machinery, locomotives and steam engines.	
Total—345,000 printed; 9,515,000 dyed.	

Kind of Goods Made.

Merrimack manuf. co.—prints and sheetings, No 23 to 40.	
Hamilton manuf. co.—prints, flannels and sheetings, 14 to 40.	
Appleton co.—sheetings and shirtings, No. 14.	
Lowell manuf. co.—carpets, rugs and cotton cloth.	
Middlesex co.—Broadcloth, Cassimere, Plain and fancy.	
Suffolk manuf. co.—drillings, 14.	
Tremont mills—sheetings, 14: shirtings, 14.	
Lawrence manuf. co.—Printing cloths. Sheetings and shirtings, 14 to 30.	
Lowell bleachery—4,500,000 lbs. bleached per ann.	
Boott cotton mills—sheetings, shirtings & printing cloths, 30, drillings No. 14.	
Massachusetts cotton mills—sheetings 13, shirtings 14, drillings 14.	
Lowell machine shop—machinists' tools and mill-work.	

Tons Anthracite Coal per annum.

Merrimack manuf. co.	6,800
Hamilton manuf. co.	3,780
Appleton co.	350
Lowell manuf. co.	2,600
Middlesex co.	4,000
Suffolk manuf. co.	340
Tremont mills.	350
Lawrence manuf. co.	1,000
Lowell bleachery.	3,000
Boott cotton mills.	1,100
Massachusetts "	2,700
Lowell machine shop—1,500 tons hard, 300 chaldrons soft.	1,800

27,620

Charcoal, bushels per annum.

Merrimack manuf. co.	3,555
Hamilton manuf. co.	2,148
Appleton company.	1,000
Lowell manuf. co.	2,000
Middlesex co.	2,000
Suffolk manuf. co.	3,500
Tremont mills.	900
Lawrence manuf. co.	3,000
Boott cotton mills.	1,800
Massachusetts "	2,000
Lowell machine shop.	15,000

35,903

Wood per annum—cords.

Middlesex manuf. co.	400
Hamilton manuf. co.	200
Middlesex co.	700
Suffolk manuf. co.	50
Tremont.	150
Lawrence manuf. co.	120
Lowell bleachery.	500
Boott cotton mills.	70
Massachusetts "	100
Lowell machine shop.	100

2,890

Oil per annum—gallons.

Merrimack manuf. co.	15,000
Hamilton manuf. co.	9,000
Appleton co.	5,400
Lowell manuf. co.—lard 8,000, sperm 5,000.	13,000
Middlesex co.—lard 27,000, sperm 8,000.	35,000
Suffolk manuf. co.	3,600
Tremont.	4,600
Lawrence manuf. co.	8,217
Lowell bleachery.	2,000
Boott cotton mills.	7,100
Massachusetts "	12,000
Lowell machine shop.	3,000

82,917 oil, 35,000 lard—total 117,917

Water Wheels, Diameter.

Merrimack manuf. co.—breast 30 ft., turbine 5 ft.	
Hamilton manuf. co.—5 turbines, 3 breast wheels.	
Appleton co.—2 turbines, each 8 ft. 4 in. in diam.	
1 " " 5 ft. 8 in. " "	

Lowell manuf. co.—turbines.	
Middlesex co.—12 and 17 feet.	
Suffolk manuf. co.—13 feet.	
Tremont—13 feet.	
Lawrence manuf. co.—17 feet.	
Boott cotton mills—17 ft., and 2 centre vent wheels as improved by Mr. Francis, 9 ft. 4 in. dia.	
Massachusetts do.—17 feet.	
Lowell machine shop—13 feet.	

Length of do. for each mill.

Merrimack manuf. co.—breast 24 feet.	
Middlesex co.—23, 21 and 45 feet.	
Suffolk manuf. co.—62 feet.	
Tremont—62.	
Lawrence manuf. co.—60 and 80 feet.	
Boott cotton mills—60 feet.	
Massachusetts " "	
Lowell machine shop—46 feet in all.	

Flour, barrels per annum.

Merrimack manuf. co.	425
Hamilton manuf. co.	200
Tremont.	100
Lowell bleachery.	600
Massachusetts cotton mills.	40

1,365

Starch, lbs. per annum.

Merrimack manuf. co.	200,000
Hamilton manuf. co.	130,000
Appleton co.	75,000
Suffolk manuf. co.	100,000
Tremont.	75,000
Lawrence manuf. co.	140,000
Lowell bleachery.	260,000
Boott cotton mills.	180,000
Massachusetts "	230,000

1,380,000

How Warmed.

All by steam.

Name of Agent.

Merrimack manuf. co.—I. Hinckley.	
Hamilton manuf. co.—John Avery.	
Appleton co.—Geo. Motley.	
Lowell manuf. co.—Alex. Wright.	
Middlesex co.—O. H. Perry.	
Suffolk manuf. co.—John Wright.	
Tremont mills—Chas. L. Tilden.	
Lawrence manuf. co.—Wm. S. Southworth.	
Lowell bleachery—C. A. Babcock.	
Boott cotton mills—Linus Child.	
Massachusetts cotton mills—Joseph White.	
Lowell machine shop—Wm. A. Burke.	

Average wages of Females clear of board, per week. \$2 00

Average wages of Males clear of board, per day \$0 80

Medium produce of Loom, No. 14 yarn, yds. per day. 45

Medium produce of a Loom, No. 30 yarn, yds. per day. 33

Average per Spindle, yards per day. 14

The Middlesex company make use annually of 600,000 teasels, 1,716,000 lbs. fine wool, 80,000 lbs. Glue, \$60,000 worth Dye Stuffs, and \$17,000 worth of Soap. They also own the Wamesit carpet mill, on the Concord river, where are consumed, annually, 93,600 lbs. coarse wool, and 36,400 lbs. of worsted yarn, producing 91,000 yards Ingrain carpeting.

The Lowell machine shop, included among the above mills can furnish machinery complete for a mill of 6,000 spindles, in three months, and a mill can be built in the same time.

The several manufacturing companies, have established an hospital for the convenience and comfort of persons employed by them respectively when sick, which is under the superintendence of one of the best of surgeons and physicians.

There are two institutions for savings—The Lowell and the City. The Lowell had on deposit, the first Saturday in October, 1849, from 4,650 depositors, \$792,291 90. The City the same time, had on deposit, from 615 depositors \$75,970 51. The operatives in the mills are the principal depositors in the above banks.

Railroads.—In last years' statistics a full account was given of the different railroads to and from Lowell, which were then in operation, showing that the railroad communication Lowell has with all parts of the country is as complete and extensive as from any other point in New England or elsewhere. Within the last year a direct road to Salem from Lowell has been projected, and will be completed in the course of the ensuing summer. The facilities thus afforded, enable passengers from Lowell for New York, Albany, or any of the intermediate places, as well as for the northward and eastward, to go through as expeditiously and as cheap as from Boston.

The city is soon to be lighted with gas,—the works and necessary preparations for its use, being entirely completed.

The **Magnetic Telegraph** will soon be in operation here—the posts and wires are all up between Roston and Burlington, and an office will shortly be opened by the Vermont and Boston telegraph company, in this city.

The fire department of Lowell, is very efficient and well organized,—in fact, as has been well said before, none can be more so.

A **Reservoir**, of great capacity, has been built on the high ground in Belvidere, east of the city, for the purpose of furnishing a ready supply of water to any part of the city, in cases of fire. The water is conveyed into the reservoir by force pumps from the Lowell machine shop Merrimack, Boott and

Massachusetts mills. Pipes are laid from the reservoir to various parts of the city, at which points hose can be attached to the hydrants without delay, when necessary.

There are three banks—The Lowell, capital \$200,000—the Railroad, capital \$600,000—the Appleton, capital \$150,000.

There is a valuable library of 7000 vols. belonging to the city, to which any one can have access by paying fifty cents per annum.

Other manufactures are produced in the city, than those specified above, of a value of \$1,500,000, employing a capital of \$400,000, and about 1,500 hands.

A vast amount of laudable and successful enterprise of a more strictly private character, might not be inappropriately alluded to in this sheet, not the least of which are the extensive powder mills of Oliver M. Whipple, Esq., and the paper and Bating mills of Perez O. Richmond, Esq., both on the Concord river, within the precincts of the city. Messrs. Fisk & Forcross' extensive lumber yard and saw mills, on the Merrimack, are also worthy of notice.

The population of Lowell in 1828 was 3,532. It is now (1850) estimated at 35,000.

Institution of Mechanical Engineers.

At a meeting of the above institution held at Birmingham, November 24th, R. Stephenson, Esq., M. P. in the chair, the following papers were read: On the Construction of Railway Axles—By J. E.

M Connell.

Continued from page 51.

It must be evident that this can only be an approximate result, but we found that these proportions enable us to attain the nearest approach to a regular curve in bending the axle; and it is worthy of notice, when the dimensions of the axle at the journal and in the boss of the wheel are determined, a calculation to ascertain the exact proportion between the wheels seems to confirm the above statement of dimensions in the eighth experiment. The greatest strain to which this portion of the axle is subject being received at the bottom flange of the wheel, and transmitted through its radius, the amount of strain which any portion of the axle has to resist is inversely as its angular distance from the point of impact is to the radius of wheel. Assuming the blow on the flange of the wheel to exert a breaking force equal to 102,229 lb., and the diameter of the axle to be 4.71 inches to resist this blow, then, dividing the axle into four equal spaces to the centre, the proportionate breaking force at each point would be as follows:—At the first, 94,381 lb., relative diameter, 4.59 inches; at second, 80,696 lb., relative diameter, 4.35 inches; at third, 67,987 lb., relative diameter, 4.11 inches; at fourth, 58,829 lb., relative diameter, 3.92 inches. With regard to engine axles, these proportions will apply where no circumstance exist of employing the centre of the axle for transmission of power. The crank axles of locomotive engines cannot be treated by any of the rules applicable to straight axles; and our experience would seem to prove that, even with the greatest care in manufacturing, these axles are subject to a rapid deterioration, owing to the vibration and jar which operates with increased severity, on account of their peculiar form. So certain and regular is the fracture, at the corner of the crank from this cause, that we can almost predict in some classes of engines the number of miles that can be run before signs of fracture are visible: a certain amount of injury can be prevented by putting counterbalance weights opposite to each crank, which lessens the vibration very considerably. It is right to observe in this place, that to some extent the injury to all axles may be increased if the wheels in which they are fixed are not properly balanced; and I have no doubt that a great portion of the constant vibration to which they are subject may be traced to the knocking action of the wheel upon the rail, owing to a want of balance. The question of deterioration of axles arising from the various causes which I have enumerated, is a very important one to all railway companies: that some change in the nature of the iron does take place is a well-established fact, and the investigation of this is most deserving of careful attention. I believe it will be found that the change from

the fibrous to the crystalline character is dependent upon a variety of circumstances. I have collected a few specimens of fractured axles from different points, which clearly establish the view I have stated. It is impossible to embrace in the present paper an exposition of all the facts on this branch of the subject; but so valuable is the clear understanding of the nature of the deterioration of axles, that I am now registering each axle as it goes from the workshops, and will endeavour to have such returns of their performances and appearances at different periods as will enable me to judge respecting their treatment. When it is considered that on the railways, of Great Britain there are about 200,000 axles employed, the advantage of having the best proportions, the best qualities, and the best treatment for such an important and vital element of the rolling stock, must be universally acknowledged.

Remarks.—The President said, that Mr. McConnell had expressed a strong opinion, that a change took place from a fibrous structure in iron to a crystalline one during the time of its being in use; and it would be satisfactory if an instance could be pointed out where this change had occurred, owing to vibration or any other treatment, for he had not been able to satisfy himself, from many experiments, that any such molecular change took place. Hammering a piece of hot iron till it is cold produced a hardness called crystalline; but the question for consideration was, supposing an iron axle were annealed by heating to a dull red heat and being allowed to cool slowly, would the "texture" of that iron undergo any alteration afterwards, from the vibration of the railway or any piece of machinery they were in the habit of employing? He had not been able to detect an instance of the kind; and in giving evidence before the Iron Girder Bridge Commission, he mentioned cases of vibration going on from year to year without any sensible change occurring in wrought or cast iron; for instance, they had the Cornish engine-beam with a strain of 50 lb. per inch, working 8 or 10 strokes per minute for more than 20 years; and certainly if a molecular change was introduced by vibration, it ought to be by that continual concussion and vibration, but none was perceived. Again the connecting-rod of a locomotive was a piece of iron in a most perplexing situation, for one having more to do and having the strain changed more frequently it was difficult to conceive; and yet he had known the connecting-rod of a locomotive engine to vibrate 8 times in a second for several years' regular work, making more than 200 million times altogether, but the iron retained its fibrous structure; and he thought axles could not be subject to so much vibration. When, therefore, he found that a connecting-rod did not change its molecular texture, must say there were good grounds for doubting that iron changes its state in axles. Then with regard to the experiments made by Mr. McConnell with a view to ascertain where axles were most exposed to tension, he could not quite agree with him; for he subjected the wheels and axles to a slow, steadily increasing pressure, till he bent the axles in different positions. The results were correct as far as regarded the slow pressure on the flanges of the wheel under the circumstances of the experiments recorded by him, but they were not a faithful representation of what takes place in practice, for it would be found that when the wheels of a carriage jarred, a violent blow was inflicted on the rail, and the strain on the axle was totally distinct from a slow pressure. He would refer to the experiments made some years ago by Mr. John Gray, on the Hull and Selby railway, and which were published in the *Civil Engineer and Architect's Journal*, or the *Mechanics Magazine*, to show how important is the element of time in the fracture of an axle. He took a round bar of iron 3 feet long and 2 inches diameter, and turned it down in the middle to 1 inch in diameter for 2 inches in length. He then took another bar, 1 inch in diameter uniformly throughout, and he tried the strength of these bars under concussion and not mere pressure. Now the severest point of strain would evidently be the middle of the bars where the diameter was the same in both, and consequently if weights were gradually and quietly laid on, the results would be alike in both bars; but when small weights were let fall on them, the bar 1 inch in diameter through-

out its whole length was found to be much stronger than that which was in the main 2 inches and one in the middle. For as time is an element when the resistance of material is concerned, regarding the axle as an elastic like a piece of india rubber, the only particles that could yield to percussion from the falling weight were those between the shoulders in the part of the axle that was turned down, but in the case of the bar an inch in diameter throughout, its whole length, the whole of the particles would yield; the one being a good spring and the other being a very bad one. If therefore appeared to him that the experiments recorded by Mr. McConnell, though correct as regarded the position in which he put them, were not correct as regarded concussion. The axles rarely if ever broke in the middle, but generally at the end close to the boss of the wheel, because the sudden change in the elasticity of the axle at the point; the portion of the axle fixed within the boss of the wheel being very rigid whilst the rest remained elastic, which caused the vibrations to be suddenly checked at that point. No doubt the plan of weakening axles in the middle had done good because it made them spring, and in crank axles it relieved the strain in the cranked part.

Mr. Henry Smith suggested that in the case of bar-iron, the exterior portion had greater tenacity than the interior or under part; and the strength would be more proportionately diminished where exterior portion was cut through. He also referred to some experiments in which he had cold-hammered fibrous iron till it became crystalline, and the effect produced corresponded with the description given by Mr. McConnell of the fractured axles.

Mr. McConnell observed, that he had met with several cases of broken axles in which a distinct annular space was observable all round the surface of fracture, that was quiet short-grained and appeared changed into a crystalline texture, whilst the centre of the axle remained fibrous. He admitted that his experiments were only approximate, and that he had not put the strain in the natural way; but it was almost impossible to do so in consequence of the great trouble and expense that would accompany it; at the same time the results had been confirmed by calculation. With regard to the axle fitting into the wheel, they now allowed only a very small shoulder, not exceeding a sixteenth of an inch; and this shoulder was not square but tapered, and the boss of the wheel was slightly coned to fit the shoulder.

Mr. Cowper did not believe that any axle which when broken proved to be crystalline had ever been fibrous in its character.

Mr. Ramsbottom considered that a change took place in the axle from the effect of mere mechanical action, and his observations tended to confirm him in that opinion. Some time ago he selected an axle which had not a very good form of journal, and the end broke off with two blows of a 12 lb. hammer. This axle had for three years been subject to a strain vertically, which was reversed at every revolution, and it came off with a crystalline fracture. He then tried the part that had been within the boss of the wheel, which had not been subject to this great strain, and found the strength was very much greater than that of the journal, for it required 79 blows to break it off, and in that case the fracture was fibrous. A parallel case might be observed with reference to an ash stick, which if doubled would break with a fibrous fracture; but if subjected to vibration, however slight, running through it a great number of times, it would break in a different mode. He thought the strain on a locomotive connecting-rod was by no means so great for the sectional area as upon an axle-journal; and the latter had two reversed strains for every revolution of the small wheels, but the connecting-rod had only two for each revolution of the driving-wheels.

The President said, he was only desirous to put the members on their guard against being satisfied with less than incontestible evidence as to a molecular change in iron, for the subject was one of serious importance, and the breaking of an axle, had on one occasion rendered it questionable whether or not the engineer and superintendent would have had a verdict of manslaughter returned against them. The investigation hence required the great-

est caution; and in the present case there was not evidence to show that the axle was fibrous beforehand, but crystalline when it broke. He therefore wished the Institution, connected as they were with the manufacture of iron, to pause before they arrived at the conclusion that iron is a substance liable to crystalline or to a molecular change from vibration. For his own part, he was now induced to look upon wrought-iron as literally elastic, like a piece of india-rubber; for in the case of the Britannia Tubular Bridge, where they had two 10 inch square chains or bars, each 100 feet in length, it was found that before the tube was raised, the chains or bars stretched nearly 2 inches in length at each time of lifting, but resumed their original length when the chain was withdrawn; the same action being repeated every time the tube was lifted. He could therefore only regard these 10-inch bars of iron analogous to a piece of india-rubber.

Mr. McConnell said, he had one specimen of an axle which he thought furnished nearly incontestible evidence of the truth of his position, that a change took place in the texture of the iron. One portion of this axle was clearly fibrous iron, but the other end broke off as short as glass. The axle was taken and hammered under a steam hammer, then heated again and allowed to cool, after which they had to cut it nearly half through and to hammer it a long time before they could break it.

The President remarked, that this was a case of converse reasoning; for it was an instance of a piece of crystalline iron being converted into fibrous iron. Iron when it was once heated and allowed to cool gradually, acquired a close and fine grain, but became neither crystalline nor fibrous; if cooled suddenly it acquired a crystalline grain, and if rolled while being cooled it became fibrous, but he did not think that it underwent any molecular change from mechanical action after it was cold.

Mr. Henry Smith observed, that throwing cold water upon hot journals did great injury by crystallising that portion of the axle.

Mr. Slate did not think that any change from a fibrous to a crystalline texture was produced in iron unless it were strained beyond the limit of its elasticity. Some of the pump-rods in Staffordshire which had been in use for 18 years, were subject to a strain of 3½ tons per square inch; and a short time ago he had occasion to ascertain their actual performance with reference to this very question, and this not being considered conclusive, he had made a machine in which he had put an inch square bar subjected to a constant strain of 5 tons, and an additional varying strain of 2½ tons, alternately raised and lowered by an eccentric 80 or 90 times per minute, and this motion was continued for so long a time that he considered it equal to the effect of 90 years' railway working, but no change whatever was perceptible; and therefore he was one of those who did not believe in a change from a fibrous to a crystalline structure in iron. He remembered a case where a question having arisen as to the manufacture of a certain shaft, it was agreed to hammer it until it split, as a means of discovering the nature of the manufacture of the shaft: the result was satisfactory; and the iron appeared still fibrous in texture.

The further consideration of the paper was then adjourned, and the Chairman said he wished that more of the members had been present at the meeting, and hoped they would attend and assist it the further discussion of the subject.

The third and last paper read was "*Nasmyth's Patent Girders and Fire-proof floors*," contributed by Mr. S. Lloyd, of Wednesbury. The paper was illustrated by drawings and models. A discussion followed the reading of the paper, and after a vote of thanks to the President, the meeting adjourned.

Iron Masters' Meeting.

We give below the proceedings of a meeting of iron manufacturers recently held in Baltimore.—As we have of late said and written so much in reference to the necessity of a further protection to the iron interests of the country we must content ourselves with simply copying the proceedings of the meeting referred to:

At an adjourned meeting of the iron masters and others interested in the manufacture of iron in Maryland, held at the Exchange Hotel on the 2d inst.,

S. S. Lee, Esq., made the following report on behalf of the committee who had been appointed at a previous meeting to report upon the present depressed condition of the iron interest of the State:

The committee appointed at the meeting of the iron masters, held in Baltimore on the 3d November, to report upon the present depressed condition of the state, respectfully report:

That, in the discharge of the duty assigned them, they have obtained information from every furnace and rolling mill in the state. The number of furnaces is thirty-one: the number of rolling mills for bars and railroad iron is five. Of the furnaces eleven have stopped within the last two years, and six more have discontinued their mining operations, and are stopping as fast as the material on hand is used up. Those now at work must also stop, unless there is a change in the condition of the trade.

The rolling mills for the manufacture of bars and railroad iron show even a more disastrous condition of that branch of the iron interest of the state. Of the five mills, only one is at work, and that one but partially so; the others having been compelled to discontinue their operations, the price for English bars and rails having ruled below the cost of producing them for the last two years.

The amount of iron produced when the works are in operation is about 55,000 tons of pig, and about 20,000 tons of bars and rails per annum. In the manufacture of this amount of iron, support, is given to nearly 50,000 persons in our own state;—while in the coasting trade incident to it, a large number of men are employed from other states; for a great portion of the pig iron made in Maryland is carried to the manufacturing districts of New England by their coasting vessels, and most of the bars and rails to other parts of the country.

Your committee finds the chief cause for the extraordinary depression of the iron interest to exist in the fluctuations of the English and Scotch markets, growing out of interruptions in the usual channels of their trade; for whenever such interruptions occur, as in '41 and '43, and in the past two years, '48 and '49, their surplus production is thrown upon the American markets, glutting it, and thereby causing the stoppage of our works, and the consequent ruin of a large number of our manufacturers.

Your committee can see no remedy for this, so long as the present duty on iron remains unchanged, and the very great difference in wages between the countries exists. The English and Scotch iron masters have perfect control over their labor, until it is reduced almost to the point of subsistence, through their thorough organization, the low interest on capital, and the superabundance of laborers—while, in the United States, the demand for labor is such that the iron masters cannot reduce wages below the price paid to laborers in other branches of business. At the regular quarterly meetings of iron masters in England, the price of iron for the ensuing quarter is declared, and the price paid for labor depends upon the price of iron so declared.

The power which they possess over their labor is exhibited in their ability to reduce the price as the necessity of the case may require, and still continue to manufacture it. For example: during the years 1845, 1846 and 1847, the price of bar iron at Liverpool averaged respectively £9 4s., £9 13s., and £9 17s.; and before the close of 1848 the price was reduced to £4 15s., and has varied but a few shillings from that time to the present, showing a reduction in less than twelve months of nearly 50 per cent. In Scotch pig iron the reduction has also been as great. In 1845 the average price was £4 0s. 3d., and in 1848 the average price was only £2 2s., and at that extreme low price it has continued to the present.

From the most reliable information your committee have ascertained the cost of charcoal pig iron in the vicinity of Baltimore to be from \$22 to \$23 50 per ton, and in the making of that iron the material—ore, wood, &c., as it stands in and on the ground, is worth only from \$2 to \$3 per ton; the difference between the material and the cost being the wages paid in its manufacture.

There are situations in the state where coal and ore are so contiguous that coke iron can be produced at a less cost; but when the transportation to market is added, the cost there does not differ ma-

terially.

The experience of the last four years has shown that the *ad valorem* duty, without a minimum, as laid by the tariff act of 1846, has operated very injuriously to the interest of the American manufacture. For when the price of iron is high abroad, the duty is high at home, giving to our manufacturers an incidental protection, which continues so long as the foreign market remains high; but as soon as the foreign market fluctuates the duty falls with it, so that at the time when the highest duty is needed by us to enable us to sustain a competition with the foreign manufacture, the protection which we had received from the duty is taken from us—thus acting as a *sliding scale* against the American manufacture. When the tariff act of 1846 was passed, the 30 per cent. duty on the price of iron at Liverpool, (\$50) was \$15 per ton; the cost and duty added made the price \$65. But for the last two years the price has fallen from \$50 at Liverpool to \$27 per ton, and the duty from \$15 to \$8 per ton—making the cost of iron and duty \$35 per ton, a fluctuation of \$30 per ton.

To sustain our manufacture we require the reverse of the operation of the *ad valorem* duty. When the price abroad is highest we need the least duty; and when it is lowest we need the highest.

It is of the greatest importance to the prosperity of the American manufacturer that the fluctuations of the foreign market should have as little effect as possible upon our own. They may be lessened by a fixed specified duty on the part of the government, or by sliding scale of duties in favor of our manufactures, *not against them*, as our present *ad valorem* duty produces.

We do not ask for excessive or prohibitory duties but we respectfully ask, in collecting the duties necessary for the operations of the government, that they be so arranged as to *foster and promote* the American manufacture.

Your committee would call your attention to the very large quantity of Scotch pig iron and bars, which the foreign manufactures have sent into the markets of this country in the last year. Availing themselves of the low duties, they have sent large stocks of iron to our markets, which from the very low rates of interest on capital at home, they can afford to hold until the regular wants for consumption absorb them.

In like manner has the *ad valorem* duty operated upon other important interests of our state, in the manufacture of many articles from iron. The shipping of Baltimore has been supplied with cables and anchors of the manufacture of Maryland until within the last two years, but the great fall of prices abroad, and consequently the duties at home, has caused those establishments to be closed, and the business to be entirely stopped.

Your committee would therefore recommend that the condition of our works, and the causes which have produced it, be made known to our Representatives in Congress by a committee, who shall urge upon them the necessity of such modification in the arrangement of the tariff necessary to the support of government as will afford us all the benefit of incidental protection, in the collection of the revenues—either a specific duty, which is the most simple, or a sliding scale which shall increase the duty with the fall in price in the foreign markets.

Respectfully,

JOHN BARKER,
STEPHEN S. LEE,
E. T. ELLIOTT,
PETER MOWEL,
H. ABBOTT,

Committee.

The report having been read, it was unanimously adopted.

E. Pratt, Esq., moved that a committee of ten be appointed by the chair in accordance with the recommendation of the report; and that said committee have power to fill any vacancies which may occur.

The resolution was adopted, and the following gentlemen appointed as that committee, viz. E. T. Elliott, E. Pratt, Stephen S. Lee, Peter Mowel, of Baltimore; C. E. Detmold, John S. Graham, of Alleghany; Joshua Bryant, Isaac Rodgers, of Hartford; Messrs. Richard Green, Robert Howard, Baltimore county.

And, upon motion, the proceedings were ordered to be published.

THE ELECTRIC TELEGRAPH—ELECTRICAL DISTURBANCES.

Electrical disturbances of a kind which do not manifest themselves in discharges of lightning, or involve life or ordinary property in danger, are quite sufficient to derange the operations of the telegraph. During snow and hail-storms, whilst dry fogs are prevailing, when the aurora borealis appears, and, in truth, during most meteorological changes, much electricity is developed in the atmosphere. It is sometimes directly transferred to the telegraph wires, but as frequently its action is only indirect. A body in which free electricity is in any way developed determines a similar electrical condition in an insulated mass of metal near it, exactly as a magnet induces magnetism in pieces of iron placed in its neighborhood. Thus an electrical cloud floating along above the extended wires generates a current of electricity in them, or to speak more strictly, causes the electricity naturally present in a latent state in the wire to become free and move along the metal. The currents which thus travel, as well as those which are directly transferred from the atmosphere, have the same effects on the index needles and signal bells as the electricity purposely sent along the wires from the battery. The needles are swung unceasingly to and fro, or remain for hours deflected to one side. The bells ring violently at irregular intervals, or stop only when their weights are run down. Signals cannot be transmitted at all when atmospheric electricity is thus largely developed; and they become more or less confused whenever it is sufficiently powerful to affect the index needles. Apart altogether from its practical importance there is something exciting in the contemplation of these strange atmospheric influences. It must be not a little startling to the drowsy occupant of some solitary telegraph station to be roused from his midnight slumber by the spectral clanging of his signal bell, bidding him quit at the wild quiverings of the magnets, now swayed plainly by no mortal hands. An imaginative man might then well recall the legends which tell of disembodied souls sent back to this earth to divulge some great secret of the world or spirits, and seeking in vain for means of utterance, which shall be intelligible to those in the body. A philosopher, too, might accept and interpret the legend; for it is sober truth that the apparently aimless and meaningless movements of the magnetic needles when vibrating at such times are, after all, the expressive finger-signs of a dumb alphabet, in which nature is explaining to us certain of her mysteries; and already, too, we are learning something of their significance.—*Edinburgh Review.*

MONTHLY ARRIVALS of Steamboats, Barges, Flats, and Keels at the Port of St. Louis for the Year 1849, with Harbor Master's Fees for Wharfage, &c., as taken from the Harbor Master's books.

	Steamboats.	Flats & keels.	Tonnage.
January.....	52	—	17,954
February.....	98	—	23,615
March.....	358	26	75,835
April.....	388	27	85,123
May.....	262	8	62,756
June.....	64	6	14,332
July.....	157	7	38,358
August.....	212	12	43,323
September.....	212	7	60,865
October.....	287	3	57,190
November.....	336	46	61,584
December.....	248	19	55,034
Totals.....	2775	161	590,139

THE BRITANNIA BRIDGE.

The operation of raising by the hydraulic machines the second monster tube, of 1,800 tons, to its intended elevation of 100 feet above sea-mark was commenced by the engineers on Tuesday, the 18th inst., 14 days only having elapsed since the day on which it was successfully floated. The action of the hydraulic presses in the towers was found to be most perfect and precise, as in their first play on the stupendous mass communicating with the chains it was worked steadily 6 feet upwards. Immediately after, the bricklayers and masons entered the recesses of the towers, and built it up firmly beneath.

The instant the masons left it another 6 feet lift was taken, and in this manner the operation is being carried on without intermission day and night, during the latter period with the assistance of large lights and fires.

An iron warehouse for California is now in course of being constructed at Liverpool, of very considerable dimensions. It is 60 feet long, 40 wide, and 36 high at the most elevated part. There will be three ranges of rooms. It is lighted by 60 windows, and will weigh rather more than 30 tons.

Lake Commerce.

The Oswego Commercial Times has the following table of collections at the custom houses from Chicago to Ogdensburg, for the year 1849.

District of Chicago.....	\$4,349 79
Cape Vincent.....	2,778 59
Sandusky and Cleveland.....	1,096 60
Detroit.....	7,846 60
Oswegatchie and Ogdensburg.....	5,802 05
Sag Harbor.....	4,100 00
Buffalo and Erie.....	38,280 03
Genesee and Rochester.....	13,906 03
Total.....	\$78,189 14
Collection at the port of Oswego, from the first day of March to 31, Dec., 1849.....	\$90,542 50
Collected above, brought down.....	78,189 14

An excess of.....\$12,353 36 collected at Oswego beyond all other ports (American) on the chain of lakes.

Railways in England.

In closing our present volume, we should have been glad if it had been in our power to offer any congratulations to our readers upon the improved aspect of railway property. From that gratification we are debarred; and we cannot enter upon the new year with any augury of increased prosperity. It remains only, by renewed vigilance and economy, to repair to the utmost the injury wrought by the faults, follies and frauds of the past; to give a vital energy to Boards of Direction by the introduction of really working men, as suggested in the report of the committee of investigation of the Calcedonian company:—to demand the most specific, plain, and full detail of expenditure in every department; to exact from the Directors that amount of responsibility which is indicated by a sound, ample and permanent investment in the stock of their own lines—*only*, if possible; and to await with patience that restoration which, under God's providence, the prosperity of the country cannot fail to impart to its greatest and most powerful agent—the railway system.—*Railway Times*.

Missouri Iron.

It is acknowledged that Missouri contains within its limits perhaps the most remarkable deposits of iron which are known to exist. One of these bears the name of the pilot Knob, situated in Madison county, about ninety-six miles south of St. Louis, and about six miles distant from the Iron Mountain. The St. Louis Republican says—

The Knob, as a deposit of mineral and in its formation, is one of the greatest curiosities in the world. It stands in the valley of a small stream, with a base covering an area of nearly three miles, rising to a height of several hundred feet. At the base, large masses of red granite rock show themselves, as if pushed or forced out, whilst the superincumbent masses of iron ore present the appearance of having been forced upwards by some terrible convulsion of nature. All the sides are covered with boulders and slabs of iron ore, of great purity, but their depth has not been satisfactorily ascertained. On the apex, the evidences of the causes which have produced this deposit are conclusive. There are found immense slabs of pure ore, twenty and thirty feet long by as many wide, and of varied thickness, from six to twelve or more inches, standing in positions, and of a formation, which leaves no doubt in the mind of the spectator that they were forced there in a state of fusion and by some tremendous internal action. The whole is of so peculiar a formation, so unlike anything to be

seen elsewhere in nature, that it is hardly possible to convey to the mind any thing like an accurate description of it. If we had the ability, we have not the space to attempt it now. It must suffice to say, that the ore is of the purest kind, and in quantity sufficient, if it could be brought into use, to supply the world for many centuries.

Extensive works for the manufacture of iron are now in operation at the Pilot Knob.

Prize Oxen and those who Fed Them.

The beast and his driver furnish us with some strange contrasts. The ox has been petted from his youth upwards. * * * The driver sent into the world to be the slave of the ox, living in the foulest of dens, harrassed by day with the toil, by night with the anxiety of providing for the hunger [scarcely ever satisfied] of the next day; fed with the coarsest of food, of less value to his employer than the cattle, the implements, the bricks and mortar of the farm. Measured against the prize beast the laborer's value shrinks into nothing.—His parish would be but too glad to make a present of him, and a hundred like him, to any man or nation under the sun. What, however, must be his feelings if he is taken into the cattle show?—He will find thousands of lookers on, who discourse with rapture of the fat oxen, with unction and scientific precision on clovers, on oil cake, and on everything which makes oxen fat; on everything except the poor human laboring machine himself, and others like him, whose highest mission seems to be to form a cheap link of communication between the fat beast and the rich owner.—*Historic Times*.

Railroads.—The Boston Journal says that the great improvement in the means of transit in Massachusetts by the introduction of railroads, is well illustrated in the little volume containing the rules of the House of Representatives, and a list of the members, with their residence while in the city.—The Journal gives compiled for the official list showing the number of members who reside at home and those who reside in the city during the present session of the Legislature. Of the Senate 12 reside at home and 22 in the city. Of the House 86 reside at home and 169 reside in the city.—Some who reside at home live at a distance of 40 miles from the city.

During the session of 1843 all the members of the Senate but 4 then resided in the city during the session, and of the House 24 then resided at home and 287 in the city.

Railroad Meeting in Bangor.—The Bangor Whig contains an advertisement calling a meeting in that city of those interested in the organization of the Penobscot and Kennebec railroad. The editor says in referring to it—"It will be seen that immediate measures are to be taken here to enlist the enterprise of our people in favor of an iron river from here to Waterville with an open navigation all the year.

Ohio.

We learn from the Governor's Message that the total amount of payments into the Treasury, during the past year, is \$2,511,119 37, and the total disbursements \$2,176,681 04—leaving a balance applicable to payment of State indebtedness of \$334,438 33; and to this amount is to be added the appropriations for redemption of State bonds, which makes the total amount applicable to payment of the State debt during the year 1849, \$632,751 41.

The total receipts from the canals and public works for the last fiscal year were \$731,173 50, being a falling off from the receipts of 1849 of \$42,390 87—occasioned by the prevailing epidemic, and the failure of the wheat crop.

Wm. O. Collins, Esq., President of the Hillsboro' and Cincinnati railroad company, is at the

Madeira House, prepared to exhibit, to such of our citizens as take an interest in the matter, the maps and charts, which show the direction and topography of the route, as well as the estimates on such part of it as have been let.

Through the politeness of Mr. C., we have seen the documents, and must express our gratification and surprise with the highly favorable character of the route, and the very satisfactory prices to stockholders at which the work has been let. The grubbing, grading, clearing and masonry, on 35½ miles of the 37½ of the whole line have been put out at the sum of \$70,350! if even so large an addition as \$10,000 have to be added for extra charges, it is questionable whether so cheap a work can elsewhere be found. For 8 miles the route pursues up Obanon creek and its tributary, Spencer's Fork.—Then, it mounts the table land, by an easy ascent, and pursues a course nearly level to Hillsboro.—Going westward, the track is nearly all the way on a gentle declivity. Most of the contracts have been taken by the farmers through whose lands the road will pass—many of whom receive a moiety of their pay in the stock of the company.—*Scioto Gazette*.

New York.

At a meeting held at Buffalo on the 23d inst. to appoint delegates to the Genesee Convention, the following resolution was adopted:

Resolved, That, as the sense of this meeting, the citizens of Buffalo will, either in their individual or corporate capacity, subscribe \$500,000, if necessary, to construct a railroad from some convenient point from the New York and Erie road to Buffalo.

The delegates to Genesee were: J. T. Dudley, O. Phelps, Wm. Ketchum, Wm. Wallace, E. Peshine Smith and H. Shumway.

A meeting has been held at Penn Yan to consider the propriety of constructing a railroad from Canandagua to Jefferson. The people in Yates and Steuben Cos. are moving upon the subject.—It is believed that a capital of \$800,000 would be amply sufficient to complete the enterprise.

A meeting of those interested in the completion of the Cape Vincent and Rome railroad, took place lately at Kingston, Canada. Mr. Phelps, one of the contractors, expatiated largely upon the advantages to Kingston, to be derived from the proposed road, when completed. Fifty miles of the road to Pierpoint's Manor are graded, and fit for the rails. It was the intention of the directors to open the road to Williamstown, by June next; and to Pierpoint's Manor, by September; and thence to Watertown the road would be opened as soon as the practicable means could be obtained.

Pennsylvania.

Pittsburgh and Erie Railroad.—We understand that 15,000 shares, amounting to \$750,000, have been subscribed to the Pittsburgh and Erie railroad, and \$35,000 paid in. This is a noble beginning, and in energetic hands will secure the certain and speedy construction of the road. This will open up all that region to the Pittsburgh market, and offer the shortest route to the lakes. Our great Western road will certainly commence with brilliant prospects. It will have connections with the lake, by railroad, at Erie, Cleveland, and Sandusky, and thus have immediate access to the immense trade of the lake region.—*Pittsburgh Gazette*.

Ohio.

Cleveland and Pittsburgh Railroad.—A meeting of the board of directors of the Cleveland and Pittsburgh railroad company was held at their office, in Ravenna, last week. We understand there was a full attendance, and much business transacted. Permanent plans were adopted for completing the road within the time specified in the contract with Messrs. Chamberlain & Co. Entire confidence is

felt that we shall have the cars running upon seventy miles of the northern end of the road by the first of November next. The best of feeling prevails along the line. The rights of way are all settled, and most of the depot grounds secured. Contracts are being made for wood, for fuel at different points. Estimates to the amount of about \$30,000 have been paid during the last month. Soon after the spring opens the iron horse, with his tremendous power, will be brought upon the road, to aid in its construction.

We have truly a "working board of directors," who deserve all honor for their indomitable perseverance. Our editorial blood circulates more briskly as the time approaches when we are to shake hands with our good friends in Cleveland, in about an hour's time, after leaving Ravenna.—"Look out for the engine when the bell rings."—*Ravenna Whig.*

Kentucky.

A railroad meeting was held at Lexington recently, for the purpose of taking into consideration the various roads projected in different portions of the State which are to centre at that city. The attendance was respectable and the spirit manifested argued well for their speedy construction.—The Observer says:

The meeting was very ably and eloquently addressed by Gen. Combs, of this city, Mr. Barbour, of Danville, and Gen. Collins, of Mayesville.—Their speeches were full of information, and produced a very happy effect. Each of the gentlemen seemed to have the great works deeply at heart, and to entertain but little doubt of their ultimate completion. Whether their construction is to be immediate, as is greatly to be desired, or postponed to some remote period, depends of course upon those at the termini and along the whole line of the works, who are deeply concerned. We will not permit ourselves to doubt that the good sense and sagacity of our citizens will suffer them to be altogether defeated or to lag for want of proper encouragement.

A series of resolutions were passed, and the meeting adjourned to meet again on the second Monday in February.

Massachusetts.

Boston and Worcester Railroad.

The late report of the Directors of this road gives the following exhibit of its operations for the past year:

The income during the year ending Nov. 30th 1849, is \$703,361—the total expenses, \$499,443, and the net income for the year, \$278,408; of this, \$270,000 has been divided in two semi-annual dividends.

The increase of the construction account, from Nov. 30th, 1848, to 1849, is \$257,939, nearly all on contracts made previous to the 1st of June last.—The income for freight is less than the year previous. This is attributed to the depressed state of manufactures. The reduction of fares also decreased the passenger receipts, although the number carried exceeded that of any former year by \$1,604,340 passengers carried one mile.

An account is given of the cost of its six branches, the expense of running, and the receipts. From this it seems that the Millbury, the Saxtonville, the Newton Lower Falls, and the Brookline branches are run at an apparent loss of about five thousand dollars. Only one, the Milford, barely pays the expenses of running.

The following was the financial condition of the road, Dec. 1, 1849:

Total construction account.....	\$4,908,332 40
Materials on hand.....	414,658 95
Total investment.....	\$5,322,991 35
Capital paid in.....	\$4,500,000 00
Debts.....	679,582 00
January dividend.....	135,000 00
Reserved income.....	8,408 00

To meet this debt, the directors recommend the creation of new stock, if leave can be obtained from the legislature, not to be issued below par. They propose to sell a large quantity of land, the cost amounting to about \$300,000, and the value esti-

ated at \$441,000, belonging to the corporation and not required for its use.

Massachusetts.

Western Railroad.—The annual report of the business of this road shows that the receipts for the year 1849, ending 30th November, were \$1,343,810.57, the expenditures \$588,322.58, net earnings \$755,287.99, being \$12,000 more than in 1848, and the expenses \$64,000 less. The whole cost of the road has been \$9,926,951.78.

There has been paid into the sinking funds the sum of \$459,578.62; and there is a balance of construction funds unexpended of \$82,989.60.

The number of through passengers in 1849, was 33,751 and of weigh passengers 402,053. The quantity of freight in 1849 was 81,728 going West, and 191,889 coming East—being 673,608 tons moved equivalent to 172,589 over the whole road. The number of barrels of flour conveyed was 590,165.

The whole number of shares of the company is 51,200. The state holds 11,004, the Massachusetts sinking fund 210, Massachusetts school fund 550; and corporations and individuals 39,736. There are 2810 individual stockholders. The company owns 8-10, ton and 6-15 ton passenger engines, and 56 freight engines, most of which are 20 tons; and 54 passengers and 850 freight cars.—*Transcript.*

Maine.

Kennebec and Penobscot Railroad.—A large and spirited meeting was held at Bangor on the 22d ult. to take into consideration the extension of the Androscoggin and Kennebec railroad to that city.

The meeting was organized by the choice of General Samuel P. Strickland, of this city, as President, Joseph Kelsy, Esq., of Guilford, Henry Butman, Esq., of Dixmont, Samuel Stetson, Esq., of Stetson, George W. Chamberlain, Esq., of Carmel, as vice Presidents, and Albert Emerson, and Geo. A. Thatcher as Secretaries.

Moses L. Appleton, Gorham L. Boynton, John S. Sayward, Levi Johnson, and Thomas A. Hill were appointed a committee to draft and report resolutions.

After some introductory remarks by the President the committee reported the following resolutions which were read by the chairman, Moses L. Appleton, Esq., and unanimously adopted:

Resolved, That the true interests of the Eastern portion of our state, demands that a railway communication should be extended from the Kennebec to the Penobscot river.

Resolved, That the city of Bangor is especially interested in the immediate construction of a road which will promote her welfare, increase her business, and add to her growth and population.

Resolved, That in the accomplishment of this great enterprise, we must look to the efforts of the Farmer, the Mechanic, the Merchant, the lumbering man, and we invoke each and all of our citizens who regard the onward prosperity of Bangor, to use every exertion to secure the immediate organization of the Penobscot and Kennebec railroad company.

Resolved, That a responsible duty devolves on our citizens to work unceasingly, to promote the desired object, and by a liberal subscription, manifested to persons residing elsewhere, the confidence they have in this great enterprise.

Resolved, That the sentiment of our people, as expressed in a resolution passed at a public meeting on the 11th day of February, 1847, remains unchanged, and in the opinion of this meeting as well as that, "the construction of a railroad having been secured to Waterville, the interests of Bangor and the east require its immediate extension to this city."

Resolved, That true policy dictates the location of the road in such a manner as will connect us with the interior towns, and open our business and market to their rich and varied products.

Massachusetts.

Fitchburg Railroad.—At the annual meeting of the company yesterday, the old board of directors, viz:—Messrs. Jacob Foster, Henry Timmins, N. F. Cunningham, E. Hasket Derby, Horatio Adams, Alvah Crocker, and Israel Longley, were chosen by nearly a unanimous vote. Some conversation was

had during the sitting with regard to the business which was to come upon the road hereafter, when Mr. Alvah Crocker gave a statement of his labors in endeavoring to raise subscriptions for the stock of the Boston and Troy railroad, which we take from the Journal:—

The amount required to be raised previous to any assessment being laid, (\$400,000) was completed a week ago last Friday night, and that portion of this great trunk might now be considered as fairly launched. Efforts were also making by the directors of the Troy and Greenfield road to infuse new life into the prosecution of their road, and as soon as one section of the latter is contracted for, the former will all be put under contract.

When this line shall have been completed, the passage from Boston to Troy, Mr. Crocker said, can be made in six hours. A man could breakfast in Boston, dine in Troy, and sup in Buffalo; and a 25 ton locomotive would draw a load of 2000 barrels of flour over the road with the same facility which on the other route it would draw 1600 barrels.

After alluding to the great advantages to the trade and commerce of Boston, which this avenue would secure, Mr. Crocker spoke of the greatest difficulty in the prosecution of the work, viz:—the tunnel through the mountain between North Adams and Greenfield. The estimated cost of this part of the work is two millions of dollars, and allowing that but 125,000 passengers and 125,000 tons of freight passed through it a year, Mr. Crocker thought it would be a paying investment.

The leading business men and financiers of Troy had assured him that four times that amount of business might with safety be calculated upon. He was ready if the various companies whose roads would be benefitted by the construction of this tunnel would agree among themselves on a fair tariff of tolls and would then lease the tunnel to a company, to go out into the community and solicit subscriptions for its construction.

The meeting was large, and the best feeling seemed to prevail among the stockholders in relation to the prosperous condition of the road.

Pork Packing in the West.

The Cincinnati Gazette of the 19th inst. has the following item:

Hogs slaughtered and cut at Cincinnati and vicinity this season, according to present figures.....	390,555
At Louisville.....	184,000
At Chillicothe.....	32,000
At Hamilton, according to the Intelligencer.....	15,000
At Evansville, Ia.....	12,830
At Lafayette.....	40,000
At Terre Haute.....	65,500
At Vincennes.....	15,000
At Clinton.....	14,000
At other points in the Wabash Valley, (Attica, 8000, Williamsport, 6000, Covington, 3500, Perrysville, 5000, Eugene 7000, Newport, 3500, Logansport, 5000, Delphi, 5000.).....	43,300

The Gazette goes on to say—

These figures for the Wabash valley, strike us as high. They are given by the Lafayette Journal of 14th inst., which states that nearly all the particulars were "gathered from the most reliable sources." If correct, they show a large increase in the amount of pork packed in the Wabash valley this season, as compared with last.

The Hamilton Intelligencer says that the figures given for that place this season, must be set against 32,000 head for last season. This shows the large falling off of 17,000.

A note from New Lisbon, Columbiana county to the Cincinnati Price Current, says: "The number of hogs packed in this county, this season, was 8,160 head, weighing 1,639,000 pounds against 7,860 head last season, which weighed 1,838,000 pounds. You perceive, the number of hogs is greater this season than last, yet there is a deficiency in the weight of 206,000 pounds."

Aggregate deficiencies have been summed up, at seven or eight places, of about 80,000 head, but they rest more upon estimates than actual returns, and therefore should not be too strongly relied upon.

AMERICAN RAILROAD JOURNAL.

Saturday, February 3, 1850.

Virginia.

Breaking Ground on the Virginia and Tennessee Railroad.

The ceremony of breaking ground on the Virginia and Tennessee railroad took place at Lynchburg on the 16th ult. in a style worthy of the importance of the event. Among those present were many of the most distinguished friends and advocates of internal improvement in that State, including Gov. Floyd, upon whom, by virtue of his official station, but more by virtue of his liberal and statesmanlike views, and his untiring devotion to the great interests of Virginia, it appropriately devolved to strike the first blow in a work, the commencement of which is justly regarded as a new era in the history of Virginia. The ceremonies of the day were commenced with an eloquent invocation of the blessings of the Almighty upon the enterprise, by the Rev. John Early, well known as one of the first and most efficient advocates of the work. The orator of the day, Joseph K. Irving, Esq., then delivered an able and eloquent address, of about half an hour's length, concluding with a graceful allusion to Gov. Floyd. Gen. Clay, the President, and C. F. M. Garnett, Esq., Engineer in chief of the company, then made brief addresses—which our position did not enable us to hear—to the Governor, who responded in a speech of great beauty and power. Having concluded, Governor Floyd, taking the spade presented by Gen. Clay, proceeded to throw up the earth. The spade was used in succession by the President, Engineer and Directors of the company, Mr. Tunstall, the President, Capt. Talcott, Engineer, and Mr. Gifford, one of the Directors of the Richmond and Danville railroad company, and many others.

After giving in the field an earnest of what the future is to accomplish, the company repaired to a magnificent entertainment served up at the Union Hotel. Among the invited guests from a distance were His Excellency, Gov. Floyd, Mr. Senator Woods, of the Franklin district, W. P. Tunstall, president, Capt. Talcott, chief engineer, and Mr. Gifford, a director, of the Richmond and Danville Railroad company, Mr. Cook, of Grayson, and Mr. H. L. Brooke, of Richmond.

Judge Wilson presided at the supper. In answer to toasts, or in compliance with direct calls made upon them, the company was addressed by Governor Floyd, and by Messrs. Tunstall, J. K. Irving, Clay, Deane, Cralle, Gifford, Talcott, Garnett and R. J. Davis.

A large number of answers from persons invited to be present, chiefly from the most distinguished citizens of Virginia and Tennessee, all breathing a similar spirit, were read to the assemblage. We think that is the most important event of the kind which has ever yet taken place in Virginia. It is the commencement of what must always continue to be one of the great lines of railway in this, and consequently one of the greatest in any country.—If wisely and properly managed, it must in a commercial and material point of view exceed in importance that of the James River and Kanawha canal. But it will do what this canal never has done, and what no canal is capable of doing, it will give a mighty impulse to the public mind and to the industry of the State, and it will be the pioneer of a new order of ideas, and the parent of a great family of similar and useful works. A canal may be a useful agent for the transportation of the coarsest

kind of luggage, but the only influence it exerts are to be found in its material results. It belongs to the past and has no sympathy with modern ideas. The rail is the great agent of social life—the great instrument of social intercourse which is the necessary condition of all civilization. The influence of a canal ceases when it delivers the barrel of flour it undertakes to carry. In estimating the influence of a railroad this only function of the canal is hardly taken into account. It serves equally well, and better, the material wants of man, and in addition it gives the highest condition of social enjoyment and intellectual progress. This is the true reason why we witness so marked a difference in the results that follow the construction of the two kinds of works. The opening of a canal may stimulate the growth of towns, by the increased facilities it gives to business, but none are attracted to it except as a mere instrument of transportation. But every person wishes to get within reach of a railroad, because he feels himself in reach of everything connected with it. It brings him into the world, in immediate connection with all that is best worth seeing and hearing, which he may visit and enjoy at will.

Such are some, and we may say the main causes of the influence of railways in stimulating the growth of the country they traverse, and their superiority over canals. We ask the people of Virginia whether, if the same amount expended in that state upon the James River and Kanawha canal, had been expended upon railroads running in a similar direction, Richmond, Lynchburg, and all the towns on its line, and the country traversed by it, would not present to us a very different aspect from what they now do? Whenever the business of a section justifies the construction of a canal, you will always find, sooner or later, a railroad alongside of the tow-path. The building the canal first involves the construction of both; but whoever heard of a canal being built to rival a railroad?

How can Brooklyn be Supplied with Water?

Among the various projects to effect the above object, we would recommend to the consideration of those entrusted with this important duty, the articles which have appeared in the two last numbers of our paper, relative to obtaining a supply of water for that city from Long Island. To our mind they point out the only mode by which the proper evidence can be obtained to serve as the basis of future action. We are satisfied that the project of supplying Brooklyn with Croton water will not be entertained till all other sources shall be found to be inadequate; and the sooner the preliminary steps indicated in these articles are taken, the sooner will those interested be in a condition for definite and immediate action.

The methods proposed, though somewhat novel in its character in this country, are in perfect accordance with natural laws. In various places in Europe works have been constructed based upon the same principles, which in fact is the case with Artesian wells. Mr. Hewson, the writer of the above articles, has had the opportunity of a widely extended experience in water works in England and Ireland, and his opinion is entitled to the most respectful consideration, independent of the argument upon which his conclusions are based.

California Gold—U. S. Mint.

The Philadelphia North American has the following authentic statement respecting the amount of gold dust from California received in the United States, and forwarded to the mint for coinage. It is derived from official sources:

The first California gold sent to the U. S. Mint was in December, 1848, and was forwarded by Mr. Carter, of Boston. In the same month of the same year, Gov. Marcy, the then Secretary of War, sent a small amount to the Mint, which had been forwarded to our Government by Gen. Mason, of California, who had received the same at San Francisco for duties. The whole amount produced only \$44,177 of coined money. The following table will show the deposits of gold at the Mint of the United States, Philadelphia, and at the Branch at New Orleans, from the first receipts in December, 1848, up to the present time, a period of about 14 months:

At the U. S. Mint, Philadelphia, in 1848.	\$44,177
Do. do. 1849.	5,481,439
Do. part of January, 1850.	850,000

Total at U. S. Mint, Philadelphia.....\$6,375,616
To which add:

At the Branch mint, N. Orleans, in 1849.	\$666,080
Do. part of January, 1850.	50,000
	\$716,080

Recapitulation.

Total deposits of California Gold at the U. S. Mint, Philadelphia.....	\$6,375,616
Total deposits of California gold at the Branch Mint, New Orleans.....	716,080

Grand total.....\$7,091,696

If the deposits of the present month are any guide in forming an estimate for the balance of the year, the deposits of California gold at all the United States Mints, during the present year, will exceed ten millions of dollars.

The coinage at the U. S. Mint, Philadelphia, during the year 1849, was as follows:

	Pieces.	Value.
Gold Eagles.....	653,618	\$6,536,180
Half do.....	133,070	665,350
Quarter do.....	23,294	58,235
Gold Dollars.....	688,567	688,567
Silver do.....	62,600	62,600
Silver Halves.....	1,252,000	626,000
Silver quarters.....	340,000	85,000
Dimes.....	839,000	83,900
Half Dimes.....	1,309,000	65,450
Copper Cents.....	4,178,500	41,785
Half Cents.....	39,864	199

Recapitulation.

Gold.....	1,498,543	\$7,948,332
Silver.....	3,802,600	922,950
Copper.....	4,218,364	41,994
Total.....	9,519,513	\$8,913,266

A still further delay will be experienced in the issue of the double eagle, in consequence of the imperfection of the die. Notwithstanding the clamor for gold dollars, and the heavy coinage to meet the supposed want, there is very little demand for them at the mint.

Railroads in want of a competent superintendent to take charge of their affairs, are referred to the advertisement in another column of Mr. Stevens, the present superintendent of the Providence and Worcester railroad.

English Railways.

Our readers will find an exceedingly interesting table in our present number of the working of English railways for the past eight years. The table was prepared with great care, and we vouch for the accuracy with which it has been copied.

New York and Erie Railroad.

The receipts of the Erie railroad for the month of January, 1850, were as follows:

From Passengers and Mails.....	\$46,752 50
From Freights.....	66,202 75

Total.....\$112,955 98

The receipts for January, 1849, were \$30,340 98

Statistics of Traffic Returns of Railways in the United Kingdom.

For Eight Years Ending 29th December, 1849.

Compiled by Mr. J. T. HACKETT, for "Herapath's Journal."

	Total Receipts.								Average Traffic per mile per week.								Miles of Railway over which Traffic was carried.				
	1849.	1848.	1847.	1846.	1845.	1844.	1843.	1842.	1849	1848	1847	1846	1845	1844	1843	1842	1849	1848	1847	1846	1845
	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£					
January.. 6	109,854	151,112	138,670	119,945	99,513	78,567	70,419	58,878	38	43	51	57	56	49	46	52	4477	3450	2700	2090	1780
January.. 13	168,987	151,727	132,411	116,084	94,569	80,855	69,052	60,890	38	44	49	55	53	51	46	51	4477	3450	2700	2090	1780
January.. 20	174,807	150,069	136,884	115,181	97,619	80,992	72,500	64,673	39	43	50	55	55	51	48	51	4477	3450	2700	2090	1780
January.. 27	172,613	149,910	135,388	115,793	98,346	81,978	74,134	63,971	39	43	49	55	55	52	49	52	4477	3476	2720	2090	1780
February.. 3	176,890	152,493	143,132	117,818	97,771	83,746	76,079	69,315	40	44	52	56	54	53	49	55	4477	3483	2720	2090	1805
February.. 10	179,016	151,246	137,675	119,170	99,652	81,007	71,208	57,560	40	43	50	57	55	51	47	51	4477	3483	2720	2090	1805
February.. 17	179,606	151,563	124,384	118,654	94,518	82,644	69,231	63,539	40	43	45	57	52	51	45	51	4477	3483	2720	2090	1805
February.. 24	177,432	153,187	126,879	119,513	96,319	78,246	69,499	66,939	39	42	46	66	53	48	46	52	4531	3599	2777	2110	1805
March... 3	181,525	160,365	138,965	123,128	98,030	80,391	73,348	68,702	40	44	50	58	54	50	48	51	4535	3608	2777	2110	1805
March... 10	185,623	160,267	140,004	121,920	97,437	82,733	75,030	70,194	41	44	50	58	54	51	49	51	4543	3619	2805	2110	1805
March... 17	184,897	162,600	139,095	126,291	100,661	80,581	76,582	72,857	40	45	49	60	56	50	50	53	4549	3628	2805	2110	1812
March... 24	187,001	162,435	143,870	123,941	103,235	85,033	78,547	75,993	41	44	51	58	57	53	52	55	4580	3664	2839	2110	1812
March... 31	191,985	170,296	146,477	126,234	110,212	92,652	80,138	78,874	42	46	51	60	61	58	51	57	4583	3664	2839	2110	1812
1st Quarter.	2,330,236	2,027,370	1,783,834	1,563,672	1,287,882	1,069,425	955,823	871,886	517	568	643	752	715	668	626	682					
April... 7	202,569	176,776	156,609	132,091	117,190	100,220	87,041	84,004	44	48	54	60	65	62	50	61	4583	3664	2891	2120	1812
April... 14	204,421	173,760	160,482	136,210	116,687	103,051	89,840	81,875	45	47	55	62	64	64	57	59	4585	3664	2891	2120	1815
April... 21	203,766	178,711	166,186	143,261	117,085	105,321	91,659	81,441	44	48	57	66	64	65	59	59	4585	3664	2929	2160	1815
April... 28	203,218	189,000	162,881	144,650	120,515	106,462	98,630	84,392	44	51	55	67	66	64	63	61	4585	3666	2929	2160	1815
May..... 5	210,581	199,315	166,807	139,977	123,622	105,667	95,356	87,176	46	54	57	64	68	65	61	63	4585	3669	2929	2202	1815
May..... 12	204,591	193,820	167,194	146,296	129,395	102,490	93,611	89,707	44	52	56	66	71	62	59	65	4626	3692	2990	2202	1815
May..... 19	202,250	192,250	169,318	144,618	150,194	103,316	91,526	89,502	43	51	57	65	82	62	58	67	4644	3759	2990	2202	1815
May..... 26	222,170	197,200	179,010	142,335	132,031	111,982	89,970	97,666	48	52	60	64	72	67	57	72	4675	3756	2990	2202	1815
June..... 2	236,700	191,643	193,321	154,053	127,760	120,926	99,534	80,232	50	50	64	70	70	72	63	63	4698	3798	2990	2202	1815
June..... 9	223,330	198,936	181,882	171,043	129,768	116,416	99,411	91,150	48	52	60	78	71	69	69	63	4698	3798	3031	2202	1815
June..... 16	220,200	218,156	166,678	154,935	140,690	114,829	102,688	92,765	47	57	55	69	77	68	65	65	4711	3804	3031	2232	1825
June..... 23	226,482	208,540	177,037	155,768	142,893	118,977	103,364	81,773	48	54	55	70	78	70	66	62	4711	3876	3189	2232	1825
June..... 30	232,314	208,235	184,574	156,341	137,800	118,226	103,379	92,427	49	51	58	70	71	69	65	64	4711	3876	3189	2232	1834
2d Quarter.	2,792,602	2,526,342	2,231,909	1,922,178	1,684,630	1,425,113	1,245,965	1,134,110	600	670	745	871	920	849	792	825					
July..... 7	229,066	206,211	189,192	162,301	140,336	118,843	107,755	84,217	49	53	59	68	76	70	68	63	4755	3899	3202	2370	1834
July..... 14	240,315	224,103	189,623	161,177	141,312	124,888	112,345	103,542	50	57	59	67	76	69	71	71	4782	3925	3202	2370	1830
July..... 21	243,539	222,326	195,407	173,216	154,134	130,807	112,704	100,081	51	56	61	72	80	73	71	70	4782	3963	3202	2370	1935
July..... 28	241,557	234,296	201,707	173,341	158,609	140,551	111,164	101,708	50	58	63	72	80	78	70	71	4804	3988	3202	2408	1935
August... 4	262,573	237,899	212,514	177,358	158,735	139,050	112,859	109,440	54	59	66	73	81	77	71	77	4829	4009	3202	2408	1954
August... 11	259,300	222,814	216,276	177,635	162,433	142,059	116,944	103,001	53	56	67	73	80	79	74	72	4884	3980	3202	2441	1969
August... 18	249,070	225,916	210,927	174,237	152,684	133,120	112,617	94,131	51	56	65	71	80	74	71	69	4889	3984	3242	2441	1969
August... 25	245,571	222,104	213,755	177,359	155,286	135,096	111,235	90,590	50	55	66	73	76	75	70	68	4889	3984	3242	2441	2033
Sept..... 1	245,884	227,050	207,888	175,808	149,441	137,954	110,685	96,247	50	56	63	72	73	76	70	75	4889	4057	3300	2441	2033
Sept..... 8	240,691	237,241	212,143	181,823	156,428	134,436	108,695	95,351	49	57	64	74	77	76	68	67	4926	4110	3300	2441	2033
Sept..... 15	233,855	233,100	209,571	180,352	153,288	128,658	112,132	103,033	47	56	62	72	75	73	71	69	4960	4145	3375	2498	2033
Sept..... 22	230,000	233,050	207,634	183,962	153,079	128,165	109,717	95,528	46	56	61	73	75	72	69	64	4960	4145	3375	2498	2033
Sept..... 29	230,910	220,956	204,462	174,146	149,010	131,176	109,745	96,778	46	52	60	73	73	74	69	65	4980	4178	3375	2498	2033
3d Quarter.	3,152,841	2,947,066	2,670,139	2,272,745	1,987,805	1,720,905	1,448,695	1,274,017	646	727	816	934	1002	966	913	899					
October... 6	223,973	221,196	210,609	175,612	145,276	128,364	106,610	96,179	45	52	62	70	71	72	67	65	4995	4218	3375	2513	2033
October... 13	223,907	222,013	199,393	167,374	145,651	128,135	108,192	94,740	47	52	58	66	71	72	68	64	5002	4276	3399	2541	2038
October... 20	229,017	211,547	194,773	163,655	148,509	118,533	103,942	90,379	46	49	57	64	73	66	68	60	5019	4270	3399	2541	2038
October... 27	221,746	201,925	188,087	155,350	143,530	113,977	98,459	84,217	44	47	55	60	70	64	62	56	5019	4318	3399	2574	2038
Nov..... 3	217,524	197,657	180,805	154,692	142,946	109,047	93,908	86,776	43	45	53	60	70	61	59	57	5023	4318	3399	2574	2038
Nov..... 10	209,667	190,401	175,406	150,642	132,023	101,408	86,949	77,861	42	44	51	58	65	57	55	51	5053	4318	3399	2588	2038
Nov..... 17	198,651	185,876	164,94																		

to \$1,235,797; in 1848, to \$1,083,335; and, in 1849, the increase over the preceding year amounted to \$954,811.

The average traffic receipts per mile per annum were as follows:—For 1842, \$3,118; for 1843, \$3,035; for 1844, \$3,278; for 1845, \$3,469; for 1846, \$3,305; for 1847, \$2,870; for 1848, \$2,556; and for 1849, \$2,302.

The amount of capital expended on the railways referred to in the table up to July in 1842, was \$52,380,100; in 1843, \$57,635,100; in 1844, \$63,489,100; in 1845, \$71,646,100; in 1846, \$83,165,100; in 1847, \$109,528,000; in 1848, \$148,200,000; and in 1849, to \$181,000,000.

The average cost of the railways per mile in operation would appear to be, in 1842, \$34,690; in 1843, \$36,360; in 1844, \$35,070; in 1845, \$35,070; in 1846, \$31,950; in 1847, \$31,700; in 1848, \$34,234; and in 1849, \$35,214. The increase in the average cost per mile is the worst feature in railway statistics, because it shows that the continual additions to the capital accounts of the old and completed lines, far outweigh all the professed advantages of constructing thousands of miles of new lines and branches, at considerably less cost than the average expenditure per mile on the old trunk lines. This serious evil must be remedied by closing the capital accounts of every railway, at farthest, within three years after the opening of the great main lines, and as much sooner as possible, otherwise there can be no foundation for confidence in railway property or railway management.

Railroad Iron.

2,000 Tons Heavy Rails, 57 and 61 lbs. per lineal yard, in store, and to arrive, within 30 days.

500 Tons 2½ x ½ inch flat Rails.

1000 Tons 56 lbs. per lineal yard.

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No. 68 Broad street.

February 2, 1850.

3,000 Tons Railroad Iron.

THE UNDERSIGNED IS PREPARED TO contract for the delivery of the above quantity at any port of the United States. Can be made of any required pattern and of a favorite brand.

CHARLES ILLIUS,
1m3 20 Beaver St., New York.

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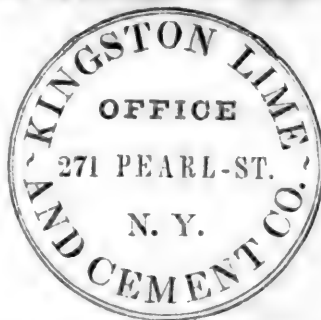
Heads of Subjects and Illustrations Comprised in this No.—Archimedian Screw Propeller, Artesian Well of Grenelle, Augers, Auger Machine, Automatic Diving Machine, Axles, Belting Machine, Belting, Bram's Tell Tale, Blasting under Water, Blast Furnaces, Blasting, Block Machinery, Blocks, etc.

No. 3 will be published next week, containing 176 plates.

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Hydraulic Cement.



HYDRAULIC CEMENT, OF BEST QUALITY, manufactured at their works, for sale in lots to suit purchasers.

Also, Ground Lime, a superior article for Builders.
ISAAC FRYER, Sec'y.
January 19, 1850.

BALL & CO'S PATENT Indestructible Water Pipe.

We publish below the opinions of others who have a personal knowledge of our Pipe, and would request all persons interested in the conveyance of water to investigate its merits for themselves. It being cheaper than Cast Iron pipes, and incomparably more durable (as there is no chance to commence decay but continually grows more permanent) it must supersede it altogether in works requiring durability and purity.—Branching, taping, altering or relaying, is done with the greatest facility, and certainty, without injury, in any size of bore from 3 feet diameter down to ½ inch under any head that can be controlled with hose or service pipes.
J. BALL & CO.
Corner of Read and Centre Sts., N. Y.

FOR the benefit of those who have requested information in regard to this excellent article, we insert the following testimonials in relation to its merits:—"In answer to the numerous inquiries in relation to J. Ball & Co's Indestructible Water pipe, composed of iron and cement and in use in our village, the undersigned, water commissioner, trustees, and late trustees of the village of Saratoga Springs, take this method of saying that we have perfect confidence in the utility, goodness and durability of said pipe. The village of Saratoga Springs has some 20,000 feet of this pipe, varying from 6½ to 14 in. in diameter, under a head of about 80 feet. It has been laid since the fall of 1845. Since it was fully completed, it has cost comparatively nothing to keep it in repair; and, although some portions are exposed to the frost, it seems to stand well the test, and answer all the purposes for which it was designed and constructed. We believe it preferable to iron pipe—is much cheaper and more durable, and we would not exchange it for any other kind of pipe yet invented, if we could without any additional expense or inconvenience. The water comes through clear and pure, and where we have had occasion to take any part of it up to improve or alter the grounds, it appeared to be just as sound and imperishable as the moment it was laid down. This testimony is entirely disinterested, and is now given to avoid the necessity of answering the many calls upon us for information on this subject. We have witnessed and many of us have superintended the laying down of the pipe in this village, and watched its operations since, and are perfectly satisfied that we have the best water pipe ever presented to the public. Saratoga Springs, Dec., '49.

G. M. Davidson,	} Water Com.
R. Putnam,	
N. B. Doe,	
R. Gardner,	} Trustees.
H. P. Hyde,	
J. L. Perry,	
J. D. Briggs,	} Late Trustees.
S. Chapman,	
J. A. Corey,	
W. S. Alger,	
Wm. Cook,	

"I certify that I was Chief Engineer, having the construction of the above work in charge, and fully concur in the foregoing statement. Dec., 1849.

"S. R. OSTRANDER, Civil Engineer."

A card, signed by the Trustees or Water Commissioners of Saratoga Spa (village), expressing their unqualified approval of J. Ball & Co's indestructible water pipe, has been shown me; whilst I fully endorse from my own experience, the statements of these gentlemen, I am enabled to add that under my direction, some six thousand feet of cement pipe was laid by Messrs. Ball & Co., in this village, that the main pipe was of 10, 4 and 6 inches bore, and is subjected to a pressure due to an average head of sixty-five feet—it has fully answered my expectations. I would further state that, having been employed by the Common Council of Albany to report a plan of supplying that city with water, I had occasion very carefully to test the merits of this kind of pipe, and was so fully convinced of the practicability of using the cement pipe for large conduits, being of three feet in diameter, as well as for smaller ones, that I recommended its adoption in the proposed work, and give my reasons for so doing.

1st. That the cement pipe is far less expensive than that of cast iron or brick.

2d. That it will sustain an equal pressure with that of cast iron; and when used for large conduits, can be carried up and down the inequalities of the surface of the ground, saving the grading, which is indispensable if a brick one is used.

3d. That it can be readily and economically repaired, and, should it become necessary, can be taken up and relaid without injuring the pipe.

4th. That this description of pipe is not so much affected by frost as one of metal, and in no way impairs the quality of the water. F. S. CLAXTON,
Engineer and Ag't Cohoes Co.

Messrs. J. Ball & Co., New York.
Cohoes, December 31, 1849.

In addition to the above testimonials, we can state that, having had experience and personal knowledge in regard to the excellent qualities and durability of the above pipe, we have no hesitation in recommending it to the public.

Starr & Alburts, 122 Nassau st.

Frederick Marquand, per H. G. M., Atty.

James, Beebe & Co.

H. W. Metcalf, 63 and 65 Centre st.

Norman White, 111 Fulton st.

John J. Merritt, No. 76 Columbia st. Brooklyn.

Platt & Brother, 20 Maiden Lane.

Geo. Griswold, South st.

J. & J. W. Meeks, 14, 16 and 18 Vesey st.

Wm. Gale, 116 Fulton st.

J. C. Brown, Builder, 10 Dutch st.

Wm. Colgate & Co.

Thos. C. Smith.

O. R. Burnham, 17 and 19 Broadway.

G. B. Hartson, 58 and 60 Vesey st.

Wm. W. Campbell, 77 St. Mark's Place.

Lorin Brooks, 240 Broadway.

Messrs. J. Ball & Co.:

Gents: Articles have appeared in the Farmer and Mechanic, from Saratoga and Cohoes, on the subject of your water pipes; I fully endorse their opinions. Your work for my son's water cure at South Orange, embracing a large amount of four and three inch pipe, under a head at least as great as the Croton of New York, shows not only certainty and efficiency, but what is equally important, perfect purity, which for medical purposes is all important, and should be considered so for drinking and other uses.

Yours, SAML. MEEKER.

Newark, January 11, 1850.

In addition to the above, we certify that J. Ball & Co. have inserted pipes for us of 10 inch bore and less, since the winter of 1844, and that last Spring we had over 1000 lbs. of lead pipe removed, and its place supplied with their pipe. We fully endorse the opinions expressed in the notices above.

BEACH, BROTHERS,

New York Sun Establishment.

Having for the past three years laid many of Messrs J. Ball & Co's patent cement pipes in the Newark Aqueduct Co., I prefer them to any pipe that I have used, their cost being one-third less than iron pipe, and also being free from wear and rust, and can most cordially recommend them for all aqueduct purposes.

SHELDON SMITH, Superintendent.

Newark, January 14, 1850.

THE NEWCASTLE MANUFACTURING Co.

I continue to furnish at the Works, situated in the town of Newcastle, Del., Locomotive and other steam engines, Jack Screws, Wrought Iron Work and Brass and Iron Castings, of all kinds connected with Steamboats, Railroads, etc.; Mill Gearing of every description; Cast Wheels (chilled) of any pattern and size, with Axles fitted, also with wrought trees, Springs, Boxes and bolts for Cars; Driving and other wheels for Locomotives.

The works being on an extensive scale, all orders will be executed with promptness and despatch. Communications addressed to Mr. William H. Dobbs, Superintendent, will meet with immediate attention.

ANDREW C. GRAY,

President of the Newcastle Manuf. Co.

NOTICE TO

Superintendents of Railroads.

TYLER'S PATENT SAFETY SWITCH.—The undersigned would respectfully call their attention to his Patent Safety Switch, which from long trial and late severe tests has proved itself perfectly reliable for the purpose for which it was intended. It is designed to prevent the train from running off when the switch is set to the wrong track by design or accident. The single rail or gate switch is established as the best and safest switch for the ordinary purpose of shifting cars from one track to another, but it is liable to the serious evil of having one track open or broken when connected with the other. My improvement entirely removes this evil, and while it accomplishes this important office, leaves the switch in its original simplicity and perfection of a plain unbroken rail, connecting one track with the other ready for use.

The following decision of the Commissioner of Patents is respectfully submitted to Railroad Engineers, Superintendents, and all others interested in the subject.

(COPY.)

UNITED STATES PATENT OFFICE, }
Washington City, D.C., April 28th, 1846.

SIR: You are hereby informed that in the case of the interference between your claims and those of Gustavus A. Nicolls, for improvements in safety switches—upon which a hearing was appointed to take place on the 3d Monday in March, 1846, the question of priority of invention has been decided in your favor. Inclosed is a copy of the decision. The testimony in the case is now open to the inspection of those concerned.

Yours respectfully, **EDMUND BURKE,**
Commissioner of Patents.

To Philo B. Tyler.

Any further information may be obtained by addressing **P. B. TYLER,** Springfield, Mass., or **JOHN PENDLETON,** Agent, 149 Hudson St., New York.

NOTICE.

TO BRIDGE BUILDERS, BRIDGE COMPANIES, and Other Individuals and Associations, who have constructed or used Bridges involving the combined principle of *Bracing, Counter-bracing and Trussing* by means of counteracting braces, keys, wedges, screws, etc., as set forth and explained in my Bridge Patent of 1830, in the words following, to wit: "A system of Counter-bracing, by means of which the truss frames are rendered stiff and unyielding, and the bridge kept in uniform action whether loaded or unloaded"—NOTICE is hereby given, that in all cases in which said combined principle has been introduced into bridges, without due license or authority from me, and without my having been duly remunerated therefor, will be regarded as infringements upon my rights and privileges, and that an amicable adjustment and settlement of all my claims in the premises may be effected by prompt application to my duly authorized Agents therefor, viz: Messrs. Clinton, Knight and Brother, of Cincinnati, Ohio, or Daniel A. Webster, Esq., 8 Pell street of the city of New York.

STEPHEN H. LONG, Patentee.
Louisville, December 10, 1849

The New York Iron Bridge Co.

LATELY KNOWN AS

Rider's Patent Iron Bridge Co.

THE Company which has hitherto furnished these Bridges, under the patent granted to the late Nathaniel Rider, deceased, have become satisfied that all the principles embraced in their construction, are included in a previous patent, granted in the year 1839, to Col. Stephen H. Long, of U. S. Engineers, and by him designated as "Long's Suspension Bridges," and have therefore made an arrangement with Col. Long, by which they have secured the exclusive right to make and vend these Bridges throughout the whole United States.

The only change consequent upon the new arrangement will be found in the name and style of the Company. The parties composing it being the same, the construction of the Bridges will be essentially the same. **August 4th, 1849.** **M. M. White,** Agent,
No. 74 Broadway, New York.

Engineering.

A GENTLEMAN OF TWENTY YEARS' EXPERIENCE in all branches of Engineering, Steam Engine and Steam Ship Building, Surveying, etc., during which time he has been engaged in special service of great trust by a foreign government, wishes occupation in his profession. Apply to
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BY **GEORGE DUGGAN,**
ARCHITECT AND CIVIL ENGINEER.

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The First or American Division of this important work will be completed in about Twelve Parts, and the APPENDIX in about Eight Parts, each part containing Two double or Four single large folio plates, accompanied by appropriate letter press descriptions, Specifications, Estimates of the cost, Bills of Timber, Iron, &c. of each structure, presenting at a glance the comparative merits, as regards economy, strength, and durability of the various modes of Bridge construction at present practised by the most eminent Engineers in the United States.

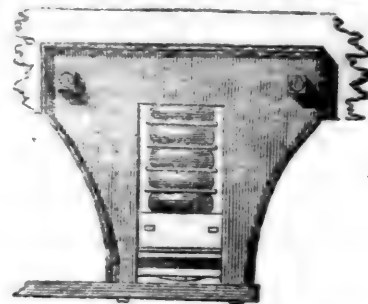
The Engraving has been entrusted to first rate artists, and is executing in a manner that cannot fail to give satisfaction, while the price (Seventy-five cents a Month) is such as will place it within the reach of all who take an interest in our great mechanical contrivances.

It shall be optional with Subscribers to take the First Division of the work only, but the APPENDIX cannot be supplied to those who do not subscribe for the First Division.

N. B.—Members of the profession, and others wishing to become subscribers, are requested to send their names without delay to the author, as below, as the publication of the names of Subscribers in one of the early Parts has been determined on, and no more copies of the work will be printed than are found necessary to supply Subscribers. Parties remitting \$9, the cost of First or AMERICAN Division of the work, shall receive it monthly as published, POST FREE, in any part of the United States.

Engineers in charge of Railroad Works, are respectfully requested to send Drawings of their Drawings of Bridges, &c., with the Specifications, Bills of Timber, Iron, &c., to **GEORGE DUGGAN** at his residence No. 179 Henry Street, New York, with a view to their insertion in this work.

FULLER'S PATENT INDIA RUBBER SPRING.



THESE SPRINGS ARE THE CHEAPEST, the lightest and most durable of any yet known. They are easily applied to new or old cars, and there is small possibility of any accident occurring to them. Other parties through Mr. Ray set up claims to an India Rubber Spring which, though the same in principle, is very inferior in its working and durability. Actions are in progress for an Infringement on Fuller's Patent against parties using that Spring.

The superiority of Fuller's Spring over that claimed by Mr. Ray is fully established and has frequently been testified to. The following are from gentlemen who have had much experience with both Springs.

"It will afford me pleasure to recommend your springs to the companies in this region, in preference to Ray's which I am confident are inferior in mechanical arrangement to yours."
JOHN M'RAE,
Engineer S. Carolina R. R., Charleston.

"I do not hesitate to allow you to say that I concur in Mr. M'RAE's opinion that Ray's springs are inferior in mechanical arrangement to Fuller's. I repeatedly expressed that opinion long before Mr. M'RAE had seen your springs (as I believe) and entertain it still."
WM. PARKER,
Gen'l Supt. of Baltimore and Ohio R. R.

Office of Sup't Norwich & Worcester R.R. Co. }
December 26, 1849. }
"I most fully concur in the opinion of Jno. McRae, Engineer of S. Carolina Railroad, that 'Rays Springs are inferior to Fuller's Springs,' and shall with pleasure recommend them to all Railroad Companies for adoption. I have used both springs on this road and have no hesitation in saying that I should in all cases prefer Fuller's Spring."

SAM'L H. P. LEE, JR.,
Supt and Engineer.

Office B. & P. R. R. Co. }
Boston, 20th December, 1849. }
"This company have cars fitted up with both Ray's and Fuller's 'Metallic India Rubber Springs,' and I do not hesitate to say that Fuller's arrangement is very much superior to Ray's."
W. RAYMOND LEE, Supt.

The following result has been obtained by experiment upon one railroad.
A set of Trucks fitted
with Steel Springs cost \$190.77 and weigh 2355 lbs.
The same with Fuller's
Springs, 131.71 " 1911 lbs.

Difference, 58.96 " 444 lbs.
Not only is there an advantage in the cost, but owing to the great reduction in weight, the car can be made lighter throughout, and so an enormous saving in weight may be effected in a Train.

G. M. KNEVITT, 38 Broadway, N. Y.,
General Agent for the U. S.
The Springs can also be had of
JAMES LEE & CO., 18 India Wharf, Boston, &
JAS. THORNTON, 110 Chestnut St., Philad.
January 2, 1850.

Wanted,

A Second Hand Locomotive, weighing from 10 to 12 tons. It is required that in answer, it will be stated, whether the engine has inside or outside connections—the price of the same delivered at Portland, Maine, and terms of payment expected. Address
VIRGIL D. PANIS,
President Buckfield Branch Railroad
Portland, Me.
November 10, 1849.

Brown's Old Established SCALE WARE HOUSE,

NO. 234 WATER ST., NEW YORK.

THE Subscriber, Practical Manufacturer of Scales of every description, respectfully asks the attention of Railroad Companies to his Improved Wrought Iron Railroad Track and Depot Scales which for strength, durability, accuracy, convenience in weighing, and beauty of workmanship, are not surpassed by any others in this country.

He is aware that this is rather a bold assertion for him to make, yet he can say with confidence that they have but to be tried to give them precedence over all others.

Bank Scales made to order, and all Scales of his make Warranted in every particular.
References given if required.

LIST NO. 1, [To be Continued.]

Engineering, Railways, Machinery, Steam Engines, etc.

JOHN WILEY, 161 BROADWAY NEW YORK, has on hand and for sale the following Works on the above subjects:

SCOTT, (D.) The Engineer and Machinists' Assistant, being a Series of Plans, Sections and Elevations of Steam Engines, Spinning Machines, Mills for Grinding Tools, etc., taken from Machinists of approved construction at present in operation, 2 volumes folio, one of letter press, the other plates, half bound in Russia, \$18 00.

TREDGOLD, (T.) The Steam Engine, its Invention and Progressive Improvement, an Investigation of its Principles and its Application to Navigation, Manufactures and Railways, a new and revised edition with considerable additions, including enlarged Examples of Locomotive Engines for Railways, Marine Engines for Sea, River and Canal service, with the Construction of Steam Vessels, Stationary Engines employed for all kinds of Manufacturing purposes, Engines employed in Mines for Raising Water, or for supplying Towns with Water, Cornish Pumping Engine, Engines for Mill Work, Flour Mills, etc., High Pressure and Non-condensing Engines, issued Monthly, 15 parts are published at 75 cents each.

BUCHANAN, (R.) Practical Essays on Mill Work and other Machinery, 70 plates, 2 vols \$14 00. Supplement to do., 1 vol., 5 00.

BRIDGES. The Theory, Practice and Architecture of Bridges of Stone, Iron, Timber and Wire, 3 vols. royal, 8mo, half Morocco, 138 Engravings and 92 Wood cuts, \$25 00.

DUGGAN, (G.) Specimens of the Stone, Iron and Wood Bridges, Viaducts, Tunnels, Culverts, etc., of the United States Railroads, part I now ready, to be completed in about twelve monthly parts at 75 cents each.

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AMERICAN LOCOMOTIVES, being a Treatise on the Theory of Steam, and its Application to Locomotive Engines, illustrated by 42 Elegant and Accurate Engravings of the most approved American Locomotives, and accompanied by full and clear explanations, designed for the use of Students, Builders and Working Engineers, by Emil Renter. The work will be completed in 16 monthly numbers, 5 numbers are now published, at 75 cts. each number. For sale by

JOHN WILEY,
Publisher and Importer,
161 Broadway, New York.

ENGINEERS.

Arrowsmith, A. T.,
Buckfield Branch Railroad, Buckfield, Me.

Banks, C. W.,
Civil Engineer, Vicksburg, Miss.

Berrien, John M.,
Michigan Central Railroad, Marshall, Mich.

Buckland, George,
Troy and Greenbush Railroad.

Clement, Wm. H.,
Little Miami Railroad, Cincinnati, Ohio.

Cozzens, W. H.,
Engineer and Surveyor, St. Louis, Mo.

Davidson, M. O.,
Eckhart Mines, Alleghany Co., Maryland.

Fisk, Charles B.,
Cumberland and Ohio Canal, Washington, D. C.

Felton, S. M.,
Fitchburgh Railroad, Boston, Mass.

Floyd-Jones, Charles,
South Oyster Bay, L. I.

Gzowski, Mr.,
St. Lawrence and Atlantic Railroad, Montreal, Canada.

Gilbert, Wm. B.,
Rutland and Burlington Railroad, Rutland, Vt.

Grant, James H.,
Nashville and Chattanooga R. R., Nashville, Tenn.

Harry, P.,
Binghamton, New York.

Holcomb, F. P.,
Southwestern Railroad, Macon, Ga.

Higgins, B.,
Mansfield and Sandusky Railroad, Sandusky City, O.

Johnson, Edwin F.,
New York and Boston Railroad, Middletown Ct.

Latrobe, B. H.,
Baltimore and Ohio Railroad, Baltimore, Md.

Miller, J. F.,
Worcester and Nashua Railroad, Worcester, Mass.

Morris, Elwood,
Schuylkill Navigation, Schuylkill Haven, Pa.

Morton, A. C.,
Atlantic and St. Lawrence Railroad, Portland, Me.

McRae, John,
South Carolina Railroad, Charleston, S. C.

Nott, Samuel,
Lawrence and Manchester Railroad, Boston,

Priehard, M. B.,
East Tennessee and Georgia R. R., Cleveland, Tenn.

Reynolds, L. O.,
Central Railroad, Savannah, Ga.

Roebbling, John A.,
Trenton, N. J.

Roberts, Solomon W.,
Ohio and Pennsylvania Railroad, Pittsburgh, Pa.

Robinson, James P.,
Androscoggin & Kennebec Railroad, Waterville, Me.

Schlatter, Charles L.,
Northern Railroad (Ogdensburg), Malone, N. Y.

Sours, Peter,
Dauphin und Susquehanna Coal Co., Dauphin, Pa.

Stark, George.,
Bost., Con. and Mont. R. R., Meredith Bridge, N. H.

Steele, J. Dutton,
Pottstown, Pa.

Trimble, Isaac R.,
Philad., Wil. & Baltimore Railroad, Wilmington, Del.

Tinkham, A. W.,
United States Fort, Bucksport, Me.

Thomson, J. Edgar.,
Pennsylvania (Central) Railroad, Philadelphia.

Whipple, S.,
Civil Engineer and Bridge Builder, Utica, N. Y.

Williams, E. P.,
Auburn and Schenectady Railroad, Auburn, N. Y.

Williams, Charles H.,
Milwaukee, Wisconsin.

Wormeley, Preble,
Central Ohio Railroad, Zanesville, Ohio.

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NO. 152 CHESTNUT STREET,
PHILADELPHIA.

BRIDGES & WEST, Proprietors.

DUNLAP'S HOTEL,
On the European Plan,
NO. 135 FULTON STREET,
Between Broadway and Nassau St.,
NEW YORK.

BUSINESS CARDS.

VanRensselaer Stevens,
Supt. Providence & Worcester R.R., Providence, R.I.
Has had 13 years' Experience in Operating Railroads.
Will go South or West if applied to.

J. & Riley Carr,
Manufacturers of Cast, Shear, German and Blister
STEEL,
Of all Descriptions, Warranted Good.
BAILEY-LANE WORKS, SHEFFIELD.

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STEEL AND FILES.

R. S. Denton,
20 CLIFF STREET, NEW YORK,
AGENT FOR

J. & Riley Carr's
BAILEY-LANE WORKS, SHEFFIELD,
Manufacturers of Cast, Shear, German and Blister
STEEL
Of all descriptions, Warranted Good
FILES.

Manufacturers of Machinists' Warranted Best Cast Steel Files, expressly for working upon Iron and Steel, made very heavy for recutting.

A full Stock of Steel and Files at all times on hand. 6m4

Cumberland, (Md.) Coals for Steaming, etc.

ORDERS RECEIVED FOR AND FILLED
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George O. Robertson,

Broker in Scotch and American Pig Iron;
Bar Iron, Lead, Spelter, Tin, Copper, etc.,
NO. 4 LIBERTY PLACE, MAIDEN LANE,
(Near Broadway,)
NEW YORK

Manufacture of Patent Wire ROPE AND CABLES,

For Inclined Planes, Suspension Bridges, Standing Rigging, Mines, Cranes, Derrick, Tilters, &c., by
JOHN A. ROEBLING, Civil Engineer,
TRENTON, N. J.

Samuel D. Willmott,
MERCHANT, AND MANUFACTURER OF
CAST STEEL WARRANTED SAWS,
IMPORTER OF THE
GENUINE WICKESLY GRINDSTONES,
NO. 8 LIBERTY STREET,
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Doremus & Harris,
ANALYTICAL & CONSULTING CHEMISTS,
179 BROADWAY, NEW YORK.
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IRON COMMISSION MERCHANTS,
No. 139 GREENWICH STREET,
NEW YORK.

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GENERAL COMMISSION MERCHANTS,
NO. 51 EXCHANGE PLACE,
BALTIMORE.

Agents for Avalon Railroad Iron and Nail Works.
Maryland Mining Company's Cumberland Coal 'CED'
—'Potomac' and other good brands of Pig Iron.

**Railroad Car Manufacturer's
Furnishing Store.**
J. S. & S. A. MARTINE,
IMPORTERS AND MANUFACTURERS OF
**RAILROAD CAR &
CARRIAGE LININGS,**
PLUSHES, CURTAIN MATERIALS, ETC.,
112 WILLIAM ST., NEAR JOHN.

3-4 and 6-4 Damasks, Union and Worsted; Mo-
reens, Rattinets, Cloths, Silk and Cotton Velvets,
English Bunting

Walter R. Johnson,
CIVIL AND MINING ENGINEER AND AT-
torney for Patents. Office and Laboratory, F St.,
opposite the Patent office, Washington, D. C.

S. W. Hill,
Mining Engineer and Surveyor, Eagle River,
Lake Superior.

J. Starks & Pruyn,
MANUFACTURERS OF ALL KINDS OF
STEAM BOILERS,
52 and 54 Liberty, corner of Pruyn street
Nathan Starks, **ALBANY** Special Partner
Wm. F. Pruyn, R. H. Pruyn.
Iron Railing, Bank and Vault Doors, Iron Shutters
Bridge and Roof Bolts, Heavy Jobbing and Forging
of all kinds.
For particulars see Adv. in another column.

To Engineers and Surveyors.
E. BROWN AND SON Mathematical inst. mak-
ers No. 27 Fulton Slip, New York, make and keep
for sale, Theodolites, Levelling inst., Levelling rods,
Surveyors Compasses, and Chains, Cases of Mathe-
matical drawing insts. various qualities, together with
a general assortment of Ivory Scales and small insts.
generally used by Engineers.

Samuel Kimber & Co.,
COMMISSION MERCHANTS
WILLOW ST. WHARVES, PHILADELPHIA.
AGENTS for the sale of Charcoal and Anthracite
Pig Iron, Hammered Railroad Car and Locomo-
tive Axles, Force Pumps of the most approved con-
struction for Railroad Water Stations and Hydraulic
Rams, etc., etc.
July, 27, 1849.

James Herron, Civil Engineer,
OF THE UNITED STATES NAVY YARD,
PENSACOLA, FLORIDA.,
PATENTEE OF THE
HERRON RAILWAY TRACK.
Models of this Track, on the most improved plans,
may be seen at the Engineer's office of the New York
and Erie Railroad.

To Railroad Companies.
—WROUGHT IRON WHEELS—
SAFETY AND ECONOMY.
NORRIS' LOCOMOTIVE WORKS,
SCHENECTADY, NEW YORK,
Are Manufacturing Wrought Iron Driving, Truck,
Tender, and Car Wheels—made from the best Ameri-
can Iron. Address **E. S. NORRIS.**
May 16, 1849.

Machinery Warehouse.
S. C. HILLS, No. 43 Fulton street, New York, has
constantly for sale Steam Engines, Boilers, Lathes,
Chucks, Drills, Planers, Force and Suction Pumps;
Tonnage, Morticing and Boring Machines, Shingle
Machines, Bolt and Nut Machines, Belting, Oil, Iron
and Lead Pipe; Rubber, Percha and Leather Hose,
&c., &c.
S. C. H.'s arrangements with several machine shops
are such that he can supply, at very short notice, large
quantities of machinery.
November 23, 1849.

Cruse & Burke,
Civil Engineers, Architects and Surveyors,
Office, New York State Institution of Civil Engineers,
STATE HALL, ALBANY, N. Y.
Drawings, specifications and surveys accurately ex-
ecuted. Pupils instructed theoretically and practical-
ly at a moderate premium.
May 26, 1849.

Eaton, Gilbert & Co.,
Railroad Car, Coach and Omnibus Builders,
TROY, N. Y.

Hudson River Foundry,
THOMAS & COLLINS,
130 Quay Street, Albany.

To Railroad & Navigation Cos.
MR. M. BUTT HEWSON, Civil Engineer, offers his
services to Companies about to carry out the surveys
or works of a line of Navigation or Railroad. He can
give satisfactory references in New York City as to his
professional qualifications; and will therefore merely
refer here to the fact of his having been engaged for
upwards of two years conducting important Public
Works for the British Government.
Communications will find Mr. Hewson at the office
of the Railroad Journal, 54 Wall Street, New York.

Alfred W. Craven,
Chief Engineer Croton Aqueduct, New York.

Cop Waste.
CLEAN COP WASTE, suitable for cleaning Rail-
road, Steamboat and Stationary Engines, con-
stantly on hand and for sale by
KENNEDY & GELSTON,
54 Pine St., New York.
October 27, 1849. 3m

IRON.
Iron.
Pig Iron, Anthracite and Charcoal; Boiler and Flue
Iron, Spring and Blistered Steel, Nail Rods, Best Re-
fined Bar Iron, Railroad Iron, Car Axles, Nails, Stove
Castings, Cast Iron Pipes of all sizes, Railway Chairs
of approved patterns for sale by
COLEMAN, KELTON & CAMELL,
109 N. Water St., Philadelphia.

IRONDALE PIG METAL, MANUFACTURED
for sale by the Bloomsburg Railroad Iron Co.
DUDLEY FISHER, Treasurer.
75 N. Water St., Philadelphia.

Railroad Iron.
500 Tons, afloat, weighing 57 pounds per lineal
yard, for sale by
COLLINS, VOSE & CO.,
158 South St.
New York, November 17, 1849. 1m46

Railroad Iron.
THE Undersigned, Agents for Manufacturers, are
prepared to contract to deliver Rails of superior
quality, and of any size or pattern, to any ports of dis-
charge in the United States.
COLLINS, VOSE & CO.,
158 South St.
New York, November 17, 1849.

Railroad Iron.
1600 Tons, weighing 60 lbs. per yard.
185 " " 57 1/2 "
580 " " 53 "
of the latest and most approved patterns. For sale by
BOORMAN, JOHNSTON & CO.,
119 Greenwich street.
New York, Oct. 13, 1849.

Railroad Iron.
THE Undersigned have on hand, ready for immedi-
ate delivery, various patterns of Iron Rails, of
best English make, and manufactured in conformity
with special specifications.
They offer also to import and contract to deliver
ahead—on favorable terms.
DAVIS, BROOKS, & CO.,
68 Broad street.
New York, Oct. 11, 1849.

Drawings and Patterns of the most approved
Rail—and specifications of quality and make of same,
are on hand at their office, for examination of parties
who may desire to inspect the same. **D. B. & Co.**
Oct. 11, 1849.

CUT NAILS OF BEST QUALITY, BAR IRON
(including Flat Rails) manufactured and for sale
by
FISHER, MORGAN & CO.,
75 N. Water St., Philadelphia.

Glendon Refined Iron.
Round Iron, Band Iron, Hoop Iron,
Square " Flat " Scroll "
Axles, Locomotive Tyres,
Manufactured at the Glendon Mills, East Boston, for
sale by **GEORGE GARDNER & CO.,**
5 Liberty Square, Boston, Mass.
Sept. 15, 1849. 3m37

**PATENT HAMMERED RAILROAD, SHIP &
BOAT SPIKES.**—The Albany Iron Works
have always on hand, of their own manufacture, a
large assortment of Railroad, Ship and Boat Spikes
from 2 to 12 inches in length, and of any form of head.
From the excellence of the material always used in
their manufacture, and their very general use for rail-
roads and other purposes in this country, the manu-
facturers have no hesitation in warranting them fully
equal to the best spikes in market, both as to quality
and appearance. All orders addressed to the subscrib-
ers at the works will be promptly executed.
JOHN F. WINSLOW, Agent.
Albany Iron and Nail Works, Troy, N. Y.
The above Spikes 1757 be had at fact prices, of
Erastus Corning & Co Albany; Menitt & Co., New
York; E. Pratt & Br. Lw. Es. 2mate Md

LAP—WELDED
WROUGHT IRON TUBES
FOR
TUBULAR BOILERS,
FROM 1 1/2 TO 8 INCHES DIAMETER.
These are the ONLY Tubes of the same quality
and manufacture as those so extensively used in
England, Scotland, France and Germany, for Lo-
comotive, Marine and other Steam Engine Boilers
THOMAS PROSSER,
Patentee.
28 Platt street, New York.

Railroad Iron.
THE UNDERSIGNED ARE PREPARED TO
contract for the delivery of English Railroad Iron
of favorite brands, during the Spring. They also re-
ceive orders for the importation of Pig, Bar, Sheet, etc.
Iron.
THOMAS B. SANDS & CO.,
22 South William street,
New York.
February 3, 1849.

Iron Store.
THE Subscribers, having the selling agency of the
following named Rolling Mills, viz: Norristown,
Rough and Ready, Kensington, Triadelphia, Potts-
grove and Thorndale, can supply Railroad Companies,
Merchants and others, at the wholesale mill prices for
bars of all sizes, sheets cut to order as large as 58 in.
diameter; Railroad Iron, domestic and foreign; Loco-
motive tire welded to given size; Chairs and Spikes;
Iron for shafting, locomotive and general machinery
purposes; Cast, Shear, Blister and Spring Steel; Boil-
er rivets; Copper; Pig iron, etc., etc.
MORRIS, JONES & CO.,
Iron Merchants,
Schuylkill 7th and Market Sts., Philadelphia.
August 16, 1849. 1y33

Railroad Iron.
THE MOUNT SAVAGE IRON WORKS, AL-
legany county, Maryland, having recently pass-
ed into the hands of new proprietors, are now prepar-
ed, with increased facilities, to execute orders for any
of the various patterns of Railroad Iron. Communi-
cations addressed to either of the subscribers will have
prompt attention. **J. F. WINSLOW, President**
Troy, N. Y.
ERASTUS CORNING, Albany.
WARREN DELANO, Jr., N. Y.
JOHN M. FORBES, Boston.
ENOCH PRATT, Baltimore, Md.
November 6, 1849.

Railroad Iron.
THE SUBSCRIBERS ARE PREPARED TO
take orders for Railroad Iron to be made at their
Phoenix Iron Works, situated on the Schuylkill Riv-
er, near this city, and at their Safe Harbor Iron Works,
situated in Lancaster County, on the Susquehanna
river; which two establishments are now turning out
upwards of 1800 tons of finished rails per month.
Companies desirous of contracting will be promptly
supplied with rails of any required pattern, and of the
very best quality.
REEVES, BUCK & CO.,
45 North Water St., Philadelphia.
March 15, 1849.

Monument Foundry.

A. & W. DENMEAD & SON,
Corner of North and Monument Sts.,—Baltimore,
HAVING THEIR

IRON FOUNDRY AND MACHINE SHOP

In complete operation, are prepared to execute faithfully and promptly, orders for Locomotive or Stationary Steam Engines, Woolen, Cotton, Flour, Rice, Sugar Grist, or Saw Mills, Slide, Hand or Chuck Lathes, Machinery for cutting all kinds of Gearing, Hydraulic, Tobacco and other Presses, Car and Locomotive patent Ring Wheels, warranted, Bridge and Mill Castings of every description, Gas and Water Pipes of all sizes, warranted, Railroad Wheels with best faggotted axle, furnished and fitted up for use, complete.
Being provided with Heavy Lathes for Boring and Turning Screws, Cylinders, etc., we can furnish them of any pitch, length or pattern.
Old Machinery Renewed or Repaired—and Estimates for Work in any part of the United States furnished at short notice.
June 8, 1849.

Iron Wire.

REFINED IRON WIRE OF ALL KINDS,
Card, Reed, Cotton-wool, Annealed, Broom, Buckle, and Spring Wire. Also all kinds of Round, Flat or Oval Wire, best adapted to various machine purposes, annealed and tempered, straightened and cut any length, manufactured and sold by
ICHABOD WASHBURN.
Worcester, Mass., May 25, 1849.

American and Foreign Iron.

FOR SALE,
300 Tons A 1, Iron Dale Foundry Iron.
100 " 1, " " " "
100 " 2, " " " "
100 " " Forge " "
400 " Wilkesbarre " "
100 " "Roaring Run" Foundry Iron.
300 " Fort " " "
50 " Catactin " " "
250 " Calkiswalungo " " "
50 " "Columbia" "chilling" iron, a very superior article for car wheels.
75 " "Columbia" refined boiler blooms.
30 " 1 x 1 Slit iron.
50 " Best Penna. boiler iron.
50 " "Puddled" " "
50 " Bagnall & Sons refined bar iron.
50 " Common bar iron.

Locomotive and other boiler iron furnished to order.
GOODHUE & CO.,
New York. 64 South street

American Pig, Bloom and Boiler Iron.

HENRY THOMPSON & SON,
No 57 South Gay St., Baltimore, Md.,
Offer for sale, Hot Blast Charcoal Pig Iron made at the Catactin (Maryland), and Taylor (Virginia), Furnaces; Cold Blast Charcoal Pig Iron from the Cloverdale and Catactin, Va., Furnaces, suitable for Wheels or Machinery requiring extra strength; also Boiler and Flue Iron from the mills of Edge & Hilles in Delaware, and best quality Boiler Blooms made from Cold Blast Pig Iron at the Shenandoah Works, Va. The productions of the above establishments can always be had at the lowest market prices for approved paper.
American Pig Iron of other brands, and Rolled and Hammered Bar Iron furnished at lowest prices. Agents for Watson's Perth Amboy Fire Bricks, and Rich & Cos. New York Salamander Iron Chests.
Baltimore, June 14, 1849. 6 mos

LAP-WELDED WROUGHT IRON TUBES
for Tubular Boilers, from 1 1/2 to 15 inches diameter, and any length not exceeding 17 feet—manufactured by the Caledonian Tube Company, Glasgow, and for sale by
IRVING VAN WART,
12 Platt street, New York.

JOB CUTLER, Patentee.

These Tubes are extensively used by the British Government, and by the principal Engineers and Steam Marine and Railway Companies in the Kingdom.

Railroad Iron.

THE TRENTON IRON COMPANY ARE NOW
turning out one thousand tons of rails per month, at their works at Trenton, N. J. They are prepared to enter into contract to furnish rails of any pattern, and of the very best quality, made exclusively from the famous Andover Iron. The position of the works on the Delaware river, the Delaware and Raritan canal, and the Camden and Amboy railroad, enables them to ship rails at all seasons of the year. Apply to
COOPER & HEWITT, Agents.
October 30, 1848. 17 Burling Slip, New York.

Pig and Bloom Iron.

**THE SUBSCRIBERS ARE AGENTS for the sale of numerous brands of Charcoal and Anthracite Pig Iron, suitable for Machinery, Railroad Wheels, Chains, Hollowware, etc. Also several brands of the best Puddling Iron, Juniata Blooms suitable for Wire, Boiler Plate, Axe Iron, Shovels, etc. The attention of those engaged in the manufacture of Iron is solicited by
A. WRIGHT & NEPHEW,
Vine Street Wharf, Philadelphia.**

Iron.

THE SUBSCRIBERS having resumed the agency of the New-Jersey Iron Company, are prepared to execute orders for the different kinds and sizes of Iron usually made at the works of the company, and offer for sale on advantageous terms.—
150 tons No. 1 Boonton Foundry Pig Iron.
100 " No. 2 do. do. do.
300 " Nos. 2 & 3 Forge do. do.
100 " No. 2 Glendon do. do.
140 " Nos. 2 & 3 Lehigh Crane do. do.
100 " No. 1 Pompton Charcoal do. do.
100 " New-Jersey Blooms
50 " New-Jersey Faggoting Iron, for shafts
Best Bars, 1/2 to 4 inch by 1/2 to 1 inch thick.
Do do Rounds and Squares, 1/2 to 3 inch.
Rounds and Squares, 3-16 to 1 inch.
Half Rounds, 1/2 to 1 in. Ovals & Half Ovals 1/2 to 1 1/2 in.
Bands, 1 1/2 to 4 inch. Hoops, 1/2 to 2 inch.
Trunk Hoops, 1/2 to 1 1/2 in. Horse Shoe & Nut Iron.
Nail Plates. Railroad Spikes.
DUDLEY B. FULLER & Co., 139 Greenwich-st. and 85 Broad-st.

WILLIAM JESSOP & SONS' CELEBRATED CAST-STEEL.

The subscribers have on hand, and are constantly receiving from their manufactory.
PARK WORKS, SHEFFIELD.
Double Refined Cast Steel—square, flat and octagon.
Best warranted Cast Steel—square, flat and octagon.
Best double and single Shear Steel—warranted.
Machinery Steel—round.
Best and 2d gy. Sheet Steel—for saws and other purposes.
German Steel—flat and square, "W. I. & S." "Eagle" and "Goat" stamps.
Genuine "Sykes," L Blister Steel.
Best English Blister Steel, etc., etc., etc.
All of which are offered for sale on the most favorable terms by
WM. JESSOP & SONS,
91 John street, New York.
Also by their Agents—
Curtis & Hand, 47 Commerce street, Philadelphia.
Alex'r Fullerton & Co., 119 Milk street, Boston.
Stickney & Beatty, South Charles street, Baltimore.
May 6, 1849.

SPRING STEEL FOR LOCOMOTIVES, TENDERS AND CARS.—The subscriber is engaged in manufacturing spring steel from 1 1/2 to 6 inches in width, and of any thickness required: large quantities are yearly furnished for railroad purposes, and wherever used its quality has been approved of. The establishment being large, can execute orders with great promptitude, at reasonable prices, and the quality warranted. Address
J. F. WINSLOW, Agent,
Albany Iron and Nail Works.

JOHNSON, CAMMELL & Co's Celebrated Cast Steel,

AND ENGINEERING AND MACHINE FILES,
which for quality and adaptation to mechanical uses, have been proved superior to any in the United States. Every description of square, octagon, flat and round cast steel, sheet, shovel and railway spring steel, best double and single shear steel, German steel, flat and square, goat stamps, etc. Saw and file steel, and steel to order for any purposes, manufactured at their Cyclops Steel Works Sheffield.

JOHNSON, CAMMELL & CO.,
100 William St., New York.
November 23 1842.

American Cast Steel.

THE ADIRONDAC STEEL MANUFACTURING CO. is now producing, from American iron, at their works at Jersey City, N. J., Cast Steel of extraordinary quality, and is prepared to supply orders for the same at prices below that of the imported article of like quality. Consumers will find it to their interest to give this a trial. Orders for all sizes of hammered cast steel, directed as above, will meet with prompt attention.
May 28, 1849.

To Steam Engine Builders.

THE Undersigned offer for sale, at less than half its cost, the following new machinery, calculated for an engine of 62 inches cylinder and 10 feet stroke, viz:
2 Wrought Iron Cranks, 60 inches from centre to centre.
1 Do. do. Connecting Rod Strap.
2 Do. do. Crank Pins.
1 Eccentric Strap.
1 Diagonal Link with Brasses.
1 Cast Iron Lever Beam (forked).
The above machinery was made at the West Point Foundry for the U. S. Steamer Missouri, without regard to expense, is all finished complete for putting together, and has never been used. Drawings of the cranks can be seen on application to
HENRY THOMPSON & SON,
No. 57 South Gay St., Baltimore, Md.
Sept. 12, 1849.

Railroad Instruments.

THEODOLITES, TRANSIT COMPASSES,
and Levels, with Fraunhofers Munich Glasses, Surveyor's Compasses, Chains, Drawing Instruments, Barometers, etc., all of the best quality and workmanship, for sale at unusually low prices, by
E. & G. W. BLUNT,
No. 179 Water St., cor. Burling Slip.
New York, May 19, 1849.

Ballard's Improved JACK-SCREW.

PATENTED.

THE ADVANTAGES OF THIS
Screw for Stone Quarries, Railroads, Steam Boiler Builders, and for other purposes are superior to any other similar machine.
The improvement consists in being able to use either end of the screw, as occasion requires.
It is capable of raising the heaviest Locomotive with ease, being portable, strong and powerful, and not likely to get out of order.
Many Railroad Companies and Boiler Makers have them in use—by whom they are highly recommended.

JACK SCREWS,
of various sizes, power and price, constantly on hand at the manufactory.

No. 7 Eldridge Street,
near Division Street.
New York, Jan. 10, 1850.

**To Railroad Companies and Contractors.**

FOR SALE.—Two Locomotive Engines and Tenders, at present in use on the Beaver Meadow Railroad, being too light for their coal trains, but well calculated for either gravel or light passenger trains.
They weigh, in running order, about 8 tons each—having one pair of driving wheels 4 feet diameter, 4 truck wheels 30 inches diameter, with cylinders 10 in. diameter, and 18 inches stroke of piston. Tenders on 4 wheels. Address
JAMES ROWLAND,
Pres't. Beaver Meadow Railroad & Coal Co.,
Philadelphia.
or, **L. CHAMBERLAIN, Sec'y,**
at Beaver Meadow, Pa.
May 19, 1849. 201f

To Inventors and Patentees.

OWEN G. WARREN, ARCHITECT, Has had many years' experience as Agent for obtaining Patents, both in this country and Europe, and will transact such business promptly and reasonably. Persons at a distance can have their business done by correspondence—without the necessity of visiting this city or Washington. Office No. 84 Merchants Exchange, Wall st., corner of Hanover st., up stairs. 17d

To Railroad Companies.

FOR SALE—A Second-hand Locomotive Engine and Tender, of about 10 tons weight, in good order, and warranted to perform well. Any company wanting a cheap engine for a passenger or light burden train, will rarely meet with an opportunity so favorable as the present. The engine and tender are in perfect running order, and will be tested to the satisfaction of any one wishing to purchase. Price \$1,500.

Address **J. B. MOORHEAD,**
Frazer P.O., Chester county, Pa.

P.S.—The Engine can be seen by calling on H. Osmond & Co., Car-builders, Broad st., Philadelphia.
September 6, 1849.

India-rubber for Railroad Cos.

RUBBER SPRINGS—*Bearing and Buffer—Fuller's Patent*—Hose from 1 to 12 inches diameter. Suction Hose. Steam Packing—from 1-16 to 2 in. thick. Rubber and Gutta Percha Bands. These articles are all warranted to give satisfaction, made under Tyer & Helm's patent, issued January, 1849.—No lead used in the composition. Will stand much higher heat than that called "Goodyear's," and is in all respects better than any in use. Proprietors of railroads do not be overcharged by pretenders.

HORACE H. DAY,
Warehouse 23 Courtlandt street.
New York, May 21, 1849.

Fire Brick.

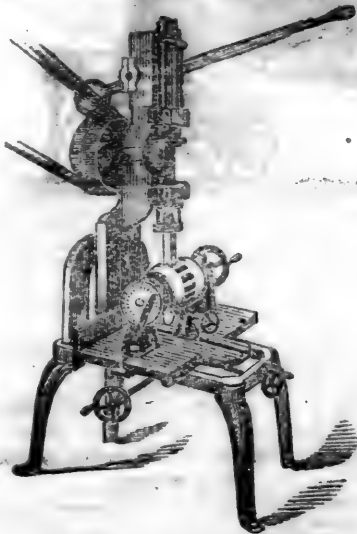
THE Subscribers have constantly on hand Rafford's Stourbridge, Oak Farms Stourbridge, Lister, Wortley, Red and White Welsh Fire Bricks, common and fancy shapes. Also,

ROOFING SLATES,
from the best Welch quarries, and of all sizes. Also, **COAL,**
of all kinds—Liverpool Orrell and Cannel, Scotch, New Castle, Pictou, Sidney, Cumberland, Virginia, and all kinds of Anthracite coals. Also,
Pig Iron, Salt, etc., etc., for sale at the lowest market price. Apply to

SAMUEL THOMPSON & NEPHEW,
275 Pearl and 43 Gold Sts., New York.

November, 23, 1849.

**Capt. Alfred Swingle's
PATENT BORING
& MORTISING MACHINE.**



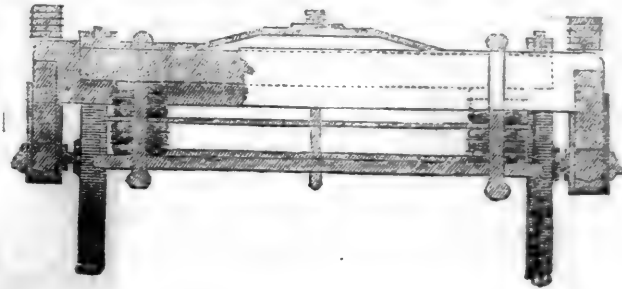
The above Machine was invented by A. SWINGLE, of Texas, in 1846, and Letters Patent were taken out in July, 1849. As a labor saving Machine it stands unrivalled even in these days of improvements. Its uses are innumerable; it may be successfully applied to Doors, Sashes, Carriages, Wheel-Hubs, and in fact to all kinds of work where the Auger and Chisel can be brought to bear.

The only limit to the speed of the working of this machine is the heating of the tools used. It will perform at least the labor of twelve men, and in vastly better manner, and can be worked equally well by steam power or by hand. It has been used and has given universal satisfaction.

For further information apply to **H. B. TANNETT,** 40 Wall St., New York, to whom all orders are to be addressed.

New York, December 16, 1849.

**FULLER'S PATENT
INDIA RUBBER CAR SPRINGS.**



RAILROAD COMPANIES are cautioned, before purchasing Springs, to examine the actual patents and judge for themselves.

Persons, under the Title of the New England Car Company, seeking fraudulently to invade Fuller's rights, have put forth so many statements for the purpose of misleading the public, that an enumeration of some facts is absolutely necessary, for the purpose of putting persons interested upon their guard.

Fuller's patent is for the application of Discs of India-rubber with Metal Plates, for forming Springs for Railway Cars and Carriages—either one disc and two plates, or ten discs and plates, or any other number, are equally covered by the patent. Fuller is not bound to the use of short discs—he may use long discs and plates.

Ray's patent is simply and wholly the forming of air-tight rubber cylinders, with hoops or bands round the outside, and the combination of elasticity of India rubber, with the elasticity of atmospheric air confined in the cylinder, and in no part of his patent is he authorized to use the form of spring which he is now fraudulently supplying to Railroad Companies. Such springs are direct and positive infringements of the very letter of Fuller's patent.

Fuller's patent is dated October, 1845, Ray's patent, August, 1848.

The spring patented by Ray never has been put in operation, and never can be made useful for Railroad cars.

A mere experiment, even if made, it is well known does not prove an invention; and it is ridiculous for such parties to hope to mislead the Presidents and Superintendents of Railroad companies, by claiming the invention because Ray alleges he made an experiment—which Fuller had made before him—had actually brought into working order, and obtained a patent for—and this too before Mr. Ray states he made his experiment—and that experiment not claimed to have been applied to a car or carriage.

Besides, the invention could not have been developed until India rubber, properly Vulcanised, could be made of a sufficient thickness. In the United States the art of vulcanising rubber by steam heat, (by which

means only can a body of rubber having any considerable thickness be vulcanised,) was not introduced until after the grant by the American government of the patent for springs to Fuller—whereas the process of vulcanising rubber by steam heat was invented in England about three years previously, and was used by Fuller there. This fact refutes entirely the claim of invention put forth by Mr. Ray, and proves the impossibility of his pretensions being true.

Fuller was the first and only inventor of the spring. A Mr. Dorr, whose connection with Mr. Goodyear is well known in this country, applied in England to Mr. Fuller, after he had published and patented his invention, and introduced another party for the purpose of obtaining the agency for the United States. They were furnished with a complete set of drawings and models, and with instructions to make arrangements for the supply of material of American manufacture—from that hour to the present not a single communication has been received from them. Some of these identical models have been traced into the hands of parties now seeking to invade Fuller's rights, and who have exhibited them as specimens of their own invention.

After this, the conveyance was made by Goodyear to certain parties here for the use for railroad springs of what he calls his Metallic rubber. Comment is unnecessary.

There are 5 or 6 different processes for the manufacture of vulcanised rubber, patented by as many different parties, some here, some in England, either of which would probably make good springs.

A large and powerful company has been organised under Fuller's patent, the particulars of which shall be given very shortly.

An action has been commenced against three railroad companies for infringement; and all other parties will assuredly be prosecuted if they continue farther to infringe upon Fuller's patent.

W. C. FULLER,

The only persons authorised to supply the Springs are **G. M. KNEVITT,** 38 Broadway, N. York,
General Agent for the U. S.; and
JAS. LEE & Co., 13 India Wharf, Boston.
JOHN THORNLEY, Chestnut st., Philad.

**Arch St. Machine Shop.
BIRKENBINE, MARTIN & TROTTER,**
Makers of

STEAM ENGINES,
and
HYDRAULIC MACHINERY,
NO. 16 ARCH STREET,
PHILADELPHIA.

Will construct Steam Engines, Pumps, for Draining Mines and Land; supplying Water to Towns, Factories, Farms, etc;

Also, Street Stops, Fire Plugs, Water Tanks, and Hydraulic Rams, with

(BIRKENBINE'S PATENT VALVES.)
B., M. & T. contract for Warming and Ventilating Buildings by Steam or Warm Water.

J. E. Mitchell,
NO. 14 OLD YORK ROAD, PHILADELPHIA.
Importer and manufacturer of

New Castle } Grindstones, of all sizes and grits.
Nova Scotia }
Wicklery }
French Burr }
Cocaheo }
Cologne }
American and }
Patent compressed } Fire Bricks and Tiles of various
Garnkirk } sizes.

Burr Blocks, Bolting Cloths, Mill Irons, etc.

**To the Proprietors of Rolling
Mills and Iron Works.**

THE Undersigned—Proprietors of Townsend's Furnace and Machine Shop, Albany—are extensively engaged in the manufacture of Machinery and fixtures for Iron, and Copper Rolling Mills, and Iron Works. Having paid particular attention to the manufacture of *Rolls* (Rollers), both *chilled* and *dry-sand*, they feel confident that they can execute orders for such castings in a satisfactory manner. And to give assurance of this, they beg leave to refer to the following named persons, proprietors and managers of some of the most extensive rolling mills in the country, viz: Jno. F. Winslow, J. Tuckerman, H. Burden, W. Burt, J. & J. Rogers, Salsus & Co., J. B. Bailey, L. G. B. Cannon, Hawkins & Atwater, etc., etc.

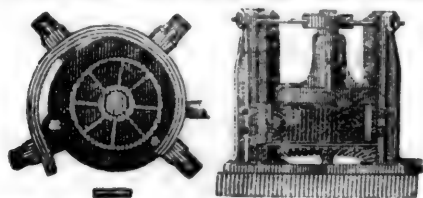
F. & T. TOWNSEND.

Albany, August 13, 1849.

Steam Boiler Explosions.

THE Subscriber having been appointed sole Agent for Faber's Magnetic Water Gauge, is now ready to supply the trade, and also individuals with this celebrated instrument. Besides the greatest safety from explosion resulting from its use, it is a thorough check against careless stoking and feeding. In marine engines it will regulate the exact quantity required in the "blow off." Pamphlets containing full information, can be had free on application to the Agent

JOSEPH P. PIRSSON,
Civil Engineer, 5 Wall st.

MACHINERY.**Henry Burden's Patent Revolving Shingling Machine.**

THE Subscriber having recently purchased the right of this machine for the United States, now offers to make transfers of the right to run said machine, or sell to those who may be desirous to purchase the right for one or more of the States.

This machine is now in successful operation in ten or twelve iron works in and about the vicinity of Pittsburgh, also at Phoenixville and Reading, Pa., Covington Iron Works, Md., Troy Rolling Mills, and Troy Iron and Nail Factory, Troy, N. Y., where it has given universal satisfaction.

Its advantages over the ordinary Forge Hammer are numerous: considerable saving in first cost; saving in power; the entire saving of shingler's, or hammerman's wages, as no attendance whatever is necessary, it being entirely self-acting; saving in time from the quantity of work done, as one machine is capable of working the iron from sixty puddling furnaces; saving of waste, as nothing but the scoria is thrown off, and that most effectually; saving of staffs, as none are used or required. The time required to furnish a bloom being only about six seconds, the scoria has no time to set, consequently is got rid of much easier than when allowed to congeal as under the hammer. The iron being discharged from the machine so hot, rolls better and is much easier on the rollers and machinery. The bars roll rounder, and are much better finished. The subscriber feels confident that persons who will examine for themselves the machinery in operation, will find it possesses more advantages than have been enumerated. For further particulars address the subscriber at Troy, N. Y.

P. A. BURDEN.

Railroad Spikes and Wrought Iron Fastenings.

THE TROY IRON AND NAIL FACTORY, exclusive owner of all Henry Burden's Patented Machinery for making Spikes, have facilities for manufacturing large quantities upon short notice, and of a quality unsurpassed.

Wrought Iron Chairs, Clamps, Keys and Bolts for Railroad fastenings, also made to order. A full assortment of Ship and Boat Spikes always on hand.

All orders addressed to the Agent at the Factory will receive immediate attention.

P. A. BURDEN, Agent,
Troy Iron and Nail Factory, Troy, N. Y.

RAILROAD WHEELS.

CHILLED RAILROAD WHEELS.—THE UNDERSIGNED are now prepared to manufacture their Improved Corrugated Car Wheels, or Wheels with any form of spokes or discs, by a new process which prevents all strain on the metal, such as is produced in all other chilled wheels, by the manner of casting and cooling. By this new method of manufacture, the hubs of all kinds of wheels may be made whole—that is, without dividing them into sections—thus rendering the expense of banding unnecessary; and the wheels subjected to this process will be much stronger than those of the same size and weight, when made in the ordinary way.

A. WHITNEY & SON,
Willow St., below 13th,
Philadelphia, Pa.

CHILLED RAILROAD WHEELS.—THE UNDERSIGNED, the Original Inventor of the Plate Wheel with solid hub, is prepared to execute all orders for the same, promptly and faithfully, and solicits a share of the patronage for those kind of wheels which are now so much preferred, and which he originally produced after a large expenditure of time and money.

A. TIERS,
Point Pleasant Foundry.

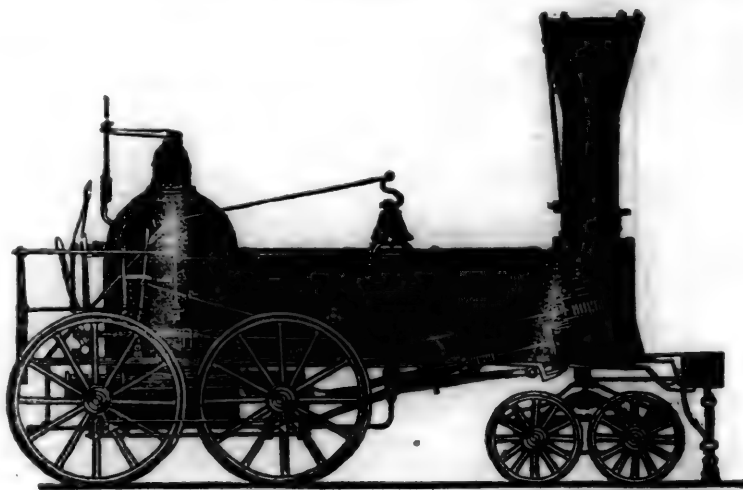
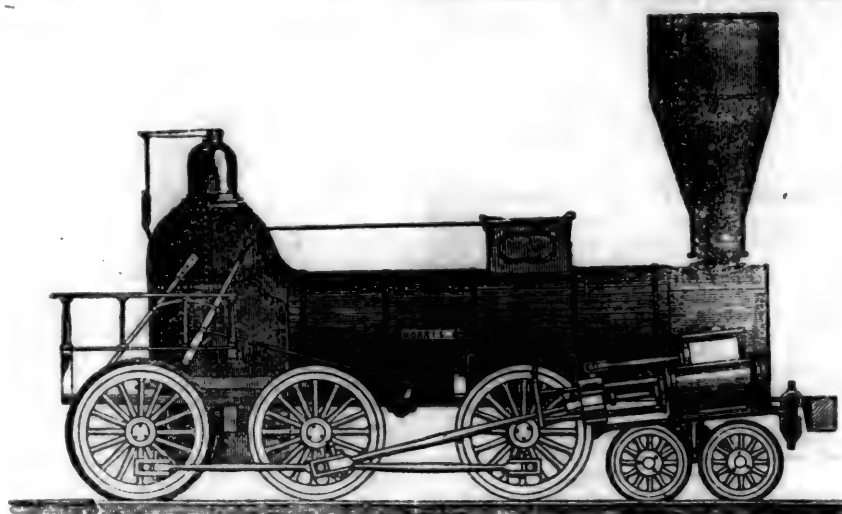
He also offers to furnish Rolling Mill Castings, and other Mill Gearing, with promptness, having, he believes, the largest stock of such patterns to be found in the country.

A. T.

Kensington, Philadelphia Co.,
March 12, 1848.

NORRIS' LOCOMOTIVE WORKS.

BUSHHILL, SCHUYLKILL SIXTH-ST., PHILADELPHIA,



THE UNDERSIGNED Manufacture to order Locomotive Steam Engines of any plan or size. Their shops being enlarged, and their arrangements considerably extended to facilitate the speedy execution of work in this branch, they can offer to Railway Companies unusual advantages for prompt delivery of Machinery of superior workmanship and finish.

Connected with the Locomotive business, they are also prepared to furnish, at short notice, Chilled Wheels for Cars of superior quality.

Wrought Iron Tyres made of any required size—the exact diameter of the Wheel Centre, being given, the Tyres are made to fit on same without the necessity of turning out inside.

Iron and Brass castings, Axles, etc., fitted up complete with Trucks or otherwise.

NORRIS, BROTHERS

LAWRENCE'S ROSENDALE HYDRAULIC Cement. This Cement is warranted equal to any manufactured in this country, and has been pronounced superior to Francis' "Roman." Its value for Aqueducts, Locks, Bridges, Flooms, and all Masonry exposed to dampness, is well known, as it sets immediately under water, and increases in solidity for years. For sale in lots to suit purchasers, in tight papered barrels, by

JOHN W. LAWRENCE,
142 Front-street, New York.

Orders for the above will be received and promptly attended to at this office.

PATENT MACHINE MADE HORSE-SHOES.

The Troy Iron and Nail Factory have always on hand a general assortment of Horse Shoes, made from Refined American Iron.

Four sizes being made, it will be well for those ordering to remember that the size of the shoe increases as the numbers—No. 1 being the smallest.

P. A. BURDEN, Agent,
Troy Iron and Nail Factory, Troy, N. Y.

Text Book of Mechanical Drawing,

FOR the use of SCHOOLS and SELF-INSTRUCTION, containing,

1st. A series of progressive practical problems in Geometry, with full explanations, couched in plain and simple terms; showing also the construction of the parallel ruler, plane scales and protractor.

2d. Examples for drawing plans, sections and elevations of Buildings and Machinery, the mode of drawing elevations from circular and polygonal plans, and the drawing of Roman and Grecian Mouldings.

3d. An introduction to Isometrical drawing, with 4 plates of examples.

4th. A treatise on Linear Perspective, with numerous examples and full explanations, rendering the study of the art easy and agreeable.

5th. Examples for the projection of shadows.

The whole illustrated with 50 STEEL PLATES.

Published by WM. MINIFIE & CO.,

114 Baltimore St., Baltimore Md.

Price \$3, to be had of all the principal booksellers.

AMERICAN RAILROAD JOURNAL.

STEAM NAVIGATION, COMMERCE, MINING, MANUFACTURES.

HENRY V. POOR, Editor.

ESTABLISHED 1831.

PUBLISHED WEEKLY, AT No. 136 NASSAU ST., NEW YORK, AT FIVE DOLLARS PER ANNUM IN ADVANCE.
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ASSISTANT EDITORS,

J. T. HODGE, *For Mining and Metallurgy.*
GEN. CHAS. T. JAMES, *For Manufactures and the Mechanic Arts.*
M. BUTT HEWSON, C. E., *For Civil Engineering.*

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American Railroad Journal.

PUBLISHED BY J. H. SCHULTZ & CO., 136 NASSAU ST.

Saturday, February 9, 1850.

Overman's Manufacture of Iron.

In this iron age of railroads, steamboats, telegraphs, etc., a book professing to give information and instruction upon the important subject of "the Manufacture of Iron in all its various Branches," is well calculated to attract the attention of those engaged in this extensive business; the more so as the author of the work before us expressly informs us, in his preface, that his book has been written "with a special regard to practical utility." He leaves it "to the intelligent reader to judge in what manner this object has been fulfilled;" and it is our intention to follow the author, as far as our patience will permit, into his labyrinth of errors, and to show how completely he has fallen short of his object, and how, instead of diffusing real knowledge, he has imposed upon the public nothing but a diffuse mass of crude errors and absurd theories; presented with a speciousness of manner and an assurance peculiar to himself, and with a pretence to personal experience well calculated to impose and mislead.

We should have allowed this work to have passed unnoticed as a mere speculation in book making, were it not that a stamp of respectability has been momentarily impressed upon it by a commendatory resolution from a highly respectable meeting

of iron workers, who lately convened at Albany. New York, for the purpose of taking into consideration the iron interests of the country, and of concocting means of bringing about a modification of the present tariff. Mr. Overman appeared there as the representative of the iron interests of Pennsylvania, and we can readily imagine by what means he succeeded in obtaining a unanimous vote in approbation of his work by that meeting; but feel quite assured that not one of the parties voting on that occasion had then read the book in question; and that if he had done so since, he would gladly ask permission to change his vote. At the same time we have no hesitation in saying that no protective tariff, however high, will save any unfortunate manufacturer from ruin, who will take Overman's book as his guide.

We will also here take occasion to "enter our downright protestation" against the dangerous practice of all ill-considered and indiscriminate commendations: too readily granted and often too readily believed.

But to return to our author. He admits in his preface that his book "may embody errors," which he hopes "the kind hearted reader will excuse upon the ground of human frailty" in general, and he relies for escape from criticism upon one fact—namely, that "he makes no claims as a writer," and because he writes in what to him is a foreign tongue. Now here our author does himself injustice; for, considering that the English is not his native tongue, he has certainly given very ample evidence of a very remarkable knowledge of the language and great facility of expression, which enables him to indulge throughout the work in an endless and ever recurring number of high-sounding but empty phrases. But all the mock humility of the author in his preface, gives way in the body of the work to the most unhesitating assurances with which he puts forth his own absurdities, and disregards, nay, even condemns, nearly all that has been said, and done by the most eminent men of science and practice in Europe and America; at the same time waiving all acknowledgements, except in the most general manner in the preface, of the numerous quotations from authors of established reputation, all of which he arrogates to himself, and presents in such manner as to leave the reader to believe that it is all the result of the knowledge and experience of Overman.

How entirely the author has failed in producing

a book of "practical utility," may readily be judged from the fact that he has nowhere in his book given the necessary data for the construction of the simplest apparatus employed in the manufacture of iron;—a few imperfect descriptions of some particular cases injudiciously selected; a few incomplete wood cuts without dimensions, nor drawn to a scale—a few empirical rules mostly erroneous—these constitute the whole ground for all the pretensions to practical utility of the work before us.

His theories, or as he terms them "philosophical investigations," the author has developed to an extraordinary length; and not content with that, he repeats them again and again, until not unfrequently he proceeds in making two demonstrations of the same subject contradict each other completely; in short he has evinced throughout a most remarkable ignorance of even the very first principles of chemistry and metallurgy, as we shall demonstrate in the course of our remarks.

The work being destitute of system and order, our best plan for reviewing it will be to follow it chapter by chapter, which we shall endeavor to do in as clear and concise a manner as possible.

Chapter I. treats of the different iron ores, their nature, composition, preparation, etc.; also of the fluxes. In the very first paragraph of this chapter Overman presents us three new kinds of iron ore, hitherto unknown to the rest of the world, we mean his "carburets, phosphurets, and chlorides of iron," of which we shall know more anon.

In speaking of the hydrated oxides of iron (brown iron stone, hematite) page 21, we are told that they "always afford a yellow powder," which, however, sometimes is "brownish or even velvet black."

Bunt or roasted, these ores, according to Overman, are strongly attracted by the magnet, whence we should naturally infer that the per oxide of iron is attracted by the magnet, for the natural hydrates of iron are always hydrates of per oxide; and the process of roasting can have no other effect than to drive off the water and to leave us the per oxide, which we all know is not attracted by the magnet. Overman has perhaps imperfectly roasted a hydrate of iron, resulting from decomposition of a carbonate of iron, and containing still some of the latter; whence he obtained a piece that was attracted by the magnet; and he thereupon concluded as a general rule that all hydrates of iron when roasted are strongly attracted by the magnet, and has thus fallen into a gross error.

Further on in the same paragraph, Overman says that "the yellow and brown varieties of the hydrates contain a large admixture of water in chemical combination;" whence we are left to infer that there must be other varieties of hydrates not containing water!

After giving us the names of a number of the States of the Union in which this species of iron ore is found, Mr. Overman confesses his doubt that there may after all be more of this ore in the United States than he at present knows of, and that "the great valley between the Rocky Mountains and the Alleghanies, is a natural basin for all such valuable deposits, swept down from Canada and the impenetrable North!" Admirable geological discovery! Comprehensive and practical! And equalled only by the statement which follows shortly after, that "the hydrates of the coal formation are mainly derived from *spathic ores*," which he afterwards tells us himself belong to the "primitive formation!"

Overman finishes his account of the hydrates of iron by telling us that "in the main this kind of ore furnishes us excellent material in the blast furnace," and that "it yields a cheap pig metal."—Are we to conclude from this that pig iron made from the hydrates is always cheap, no matter at what cost the ores and the fuel etc. may be procured?

Next in order to the hydrates come the "carburets of iron;" in his preliminary remarks on this newly discovered class of ores, Overman tells us that "science has yet done very little towards investigating the nature of the different compounds of iron and carbon." It is reasonable to suppose therefore that in his quality of practical chemist and metallurgist our author will enlighten us fully respecting this very 'deserving' class of ores; for we are told that "they deserve more attention on the part of scientific men," that "they deserve to be employed, where they can be found," and that "this ore deserves the attention of the iron master. But we are destined to disappointment in our expectations: all we get, after this presumptuous introduction, is a pretended description of this fabulous ore—which proves, however, on its face, that Overman never could have seen the ore which he meant to describe. For to say this is magnetic in the raw state, and that it "is often classed with the magnetic oxide because of its black color," is to say that which is supremely absurd. We are further informed that this carburet of iron is found in the Frostburg, Maryland, coal deposits, which we have no hesitation in pronouncing a mere vague and entirely groundless assertion.

This kind of ore which Overman has designated under the classification of "carburets of iron," is none other than the famous "Black Band" of Mushet; and which is simply a carbonate of iron, mechanically mixed with coaly matter; generally in sufficient quantity to serve for its own roasting. Mushet, who discovered this ore, and devoted much time to its introduction into practical use, never speaks of it except as a carbonate: he gives numerous analyses of it, some by himself and others by Thompson, Dr. Colquhoun, etc.

If Overman had not on almost every page of his book manifested a gross ignorance of the most elementary principles of metallurgical chemistry, this palpable error of forming a whole class of carburets out of a single carbonate, would surely be sufficient to convict him of it; as of a most culpable superficialness in not even taking the pains, whilst writing his book, to consult any ordinary text book

of chemistry. The carburet of iron is never found in nature, it is wholly an artificial product. It was supposed at one time that graphite or plumbago was a carburet of iron, but the more modern authorities, Karsten, Berthier and other distinguished chemists have established that graphite is a chemically pure carbon.

The only known carburets of iron are the irons of commerce and steel, and such combinations of iron and carbon as are produced in the laboratory. Berthier speaks doubtfully of some with definite proportions, but according to Regnault's most recent chemistry, there is but one such, viz:



which is obtained in decomposing by heat the prussiate of pot ash,



Overman has fallen into the same error with regard to the phosphurets of iron as with the carburets. Phosphurets of iron do not exist in nature. The phosphuret of iron described by him, may be obtained by heating in a crucible a mixture of phosphate of iron and charcoal; its composition is represented by the formula,



In speaking of the "arseniurets of iron," the author has confounded the arsenio-sulphuret of iron with the arseniuret; which latter contain never more than a trace of sulphur mechanically combined; whereas, the analysis of the mispickel (arsenical iron pyrites) which Overman has copied from Stromeyer, shows 21.08 per cent. of sulphur.

The "chlorides of iron" is another group of iron ores given by Overman, which have no existence in nature. We only know the chloride of iron or sesqui-chloride of iron



which is obtained by heating iron in an excess of chlorine or attacking it by nitro muriatic acid.

He gravely tells us of the various effects which this imaginary class of Iron ores will produce in the furnaces; he would have done better to have given us facts concerning those that are really met with in nature.

We now come to the "phosphates of iron," called by Overman green iron ore, because he tells us "it is of a dull blue color." The phosphate of iron cannot with propriety be classed amongst the ores of iron; it is merely a mineral substance occasionally met with in iron ores. The analysis of this mineral given in the book, has no connection with the true phosphates, artificial or natural. The former are phosphates of protoxide of iron; and when pure and anhydrous, they only contain 59.6 per cent of protoxide and 53.3 per cent. of peroxide of iron; so that it is not possible that phosphates containing water should also contain an increased quantity of the oxide of iron, as would appear from the analysis given by Overman, and which shows 62.52 per cent. of oxide of iron.

This analysis is still further from the true composition of the natural phosphates, which is by no means absolute; for they are sometimes phosphates of protoxide; and sometimes phosphates of protoxide and per oxide of iron; there are also phosphates of protoxide of iron and protoxide of manganese.

In speaking of the practical application of this substance, Overman tells us that on account of its causing the iron to be very cold short, "it is to be rejected or at least regarded with great suspicion." This would be well enough, did he not in almost

the same breath inform us also that "it is of all classes of ore the best in the blast furnace," and that, like the hydrates, the phosphates furnish a cheaper iron than that from all the other ores!

The next in order is the "carbonate of iron;" in giving an analysis of this important group of spathic iron ores, our author has been particularly unfortunate in his selection; for he has chosen an old and doubtful analysis made by Klaproth of a spherosiderite (vide Philips' or Alger's Mineralogy,) which shows 63.75 per cent. of protoxide of iron = 49.21 per cent of metallic iron. Now Berthier, Lampadius, Regnault, Dumas, etc., give as the composition of chemically pure carbonate of protoxide of iron 61.47 per cent of protoxide of iron = 47.47 of metallic iron. It is not possible therefore that any natural and impure carbonate, no matter where it may have come from, should contain more iron than the chemically pure carbonate.

To say that the spathic iron ore "is one of the most favorable ores in the Catalonia forge," is merely to exhibit his usual ignorance of the subject of which the author treats; for it is well known to every practical foreman that none but the very richest iron ores are advantageously employed in the Catalan forge; as is the case for instance with the rich magnetic ores of New Jersey, New York, South Carolina, etc. Here would have been the place for Overman to have spoken of an important class of ores resulting from the decomposition of the spathic ores, and which are known in France and Germany as the "Mines Douces" (soft ores,) and much sought after because of the superior quality of iron which they produce. These ores are a mixture of hydrated per oxide and anhydrous per oxide of iron, and often contain upwards of 60 per cent. of iron.

After describing the compact carbonate of iron—clay iron stone—which forms the principal source of supply of all the great iron works of England, Scotland, Wales, as also all the furnaces of lower Maryland, the author assigns "the difficulty of working this kind of ore to the blast furnace" as "the reason why it is not more generally in use;" and then as it were to prove by his peculiar method this strange assertion, he informs us twice in ten lines that "England and Scotland work scarcely any other kind."

In the closing remarks upon the "titanate of iron," Overman observes that "there are two classes of iron ore which do not properly belong to our department, but are interesting as well on account of their belonging to the United States alone, as on account of their large quantity and usefulness. The first of these is the "chromate of iron;" and by way of demonstrating, in his usual manner, the fact of this belonging to the United States only, our author gives us an incorrect copy of an analysis made by Vanguelin, of a specimen of chromate of iron, coming from "La Bastide Department of Var in France!"

The "Franklinite" closes the list of iron ores; this surprises us greatly, for having given us a description of several ores of iron which have no existence in reality, and of many which have no practical value for the iron manufacture. We reasonably expected that Overman would at least have noticed a very large and important class of iron ores, well known to every metallurgist and furnace man—we mean the numerous class of the silicates of iron, which our author however has passed by without even an allusion to their existence.

To be Continued.

New York. RAILROAD STATISTICS.

An act passed the Legislature on the 27th of March, 1848, directing the several railroad corporations to report annually the condition of the road, the receipts and disbursements for the year, together with other facts connected with operations on the same. In pursuance of this law, several have made reports. We are indebted for the following abstracts of them to the Albany Journal.

Schenectady and Troy Railroad.

Length of road 20½ miles. Cost of construction to Jan. 1st, 1850.....\$672,910 25
Capital stock—all paid in..... 650,000 00
The indebtedness consists of bonds having a short time to run, and demands against the company amounting to..... \$53,519 81
Amount due company, \$584. Cash on hand, \$14,231 12. Total..... 14,815 12

Debt of company..... \$38,704 69
Amount received from 55,636 passengers..... \$26,693 02
" " freight..... 19,610 60
" " mail..... 684 50
" " all other sources..... 656 32
Total receipts..... \$47,644 44
Amount paid for construction..... \$13,241 41
" " repairs, running the road, &c..... 53,663 61
" " State tolls..... 3,032 28

From the above figures, it appears that the earnings of this road have not paid its expenses during the last year. If the amount paid for construction is included in the expenditures, the deficit is \$22,202 86. If that sum was not intended to be included in the disbursements for the year, and the amount paid to the state for toll be included, the report shows a deficiency of \$9,051 45.

The company own one engine-house and two shops; 4 engines; 6 passenger, 6 baggage, 26 freight and 9 gravel cars. Also, 8 horses.

Number of miles run by passenger trains, 58,200; do. freight, 12,629. Average rate passenger cars, 25 miles; freight, 15 do. per hour. Number of men employed 46.

Oswego and Syracuse Railroad.

Length of road, 35 miles. Capital stock—all paid in..... \$350,000 00
Cost of construction, &c., locomotives and cars..... 548,353 03
The company owes upon bonds \$182,000, which was applied to the construction of the road and for outfits. They also owe individuals and corporations the sum of \$22,906 07, making their total indebtedness..... \$204,906 08
Due the company from the post office department..... 1,500 00
Received from 65,053½ passengers... 48,877 50
" " freight..... 6,475 99
" " mails..... 538 02
" " other sources..... 1,638 12

Total receipts..... \$57,529 63
Expended in repairs and running road, &c..... \$35,591 07
Paid interest on stock and bonds.... 10,356 32

Total expenditures..... 45,947 39
The company own one engine-house; 4 engines, 5 passenger, 17 freight, 3 baggage, and 22 rubble cars.

Number of miles run by passenger trains, 43,020; others, 16,880. Total, 59,900. Average rate of speed of passenger trains, 19 miles, and freight, 10 miles per hour. Men employed average about 75.

Syracuse and Utica Railroad.

This company has completed a double track from Syracuse to Utica, with suitable turnouts. Over 5000 tons of iron have been laid during the year. The last track has been laid mainly upon a gravel bed. Ten brick water houses and two of stone have been erected along the line. Two more are required. There have also been erected during the year several new wood houses; also, a large stone freight-house at Rome, at the junction of the Watertown railroad. The whole number of men

employed during the laying of the second track average 500 per day, which has occupied the whole season. The iron for the last track was made in England. It is supposed that this company is among the first, if not the first in the State, that has laid a complete double track of improved or H rail. In pressing the construction of a complete double track of iron rails, the company has been desirous to meet the public expectation. Its business might have been transacted still longer upon a single track, and it remains to be seen whether the increased cost will be sustained by its future business.

The length of road in operation is 53 miles, double track. The first was laid in 1847 and '48; weight of rail, 61 pounds to lineal yard. The second was laid in 1849; and 70 pounds to the yard. Capital stock \$2,000,000. Amount paid in is \$1,802,100.

Cost of construction to Dec. 31, 1849, \$2,363,043 55.

Indebtedness of the company amounts to \$121,300 80. This includes \$80,000 company bonds. One-half of this is due July 1st, 1850, and the remainder Jan. 1st, '51. Due the company on the same day, \$15,574, making \$105,736 50, the total debt of the company on the 31st Dec. '49.

Amount received for transportation, 294,417½ passengers..... \$326,525 67
" " of freight... 97,858 40
" " of mails... 5,414 65
" " from other sources... 2,744 03
" " from sale of old material 32,260 21
" " on new stock..... 243,000 00

Total receipts..... \$707,802 96

Amount expended in laying new track is \$341,687 99, this together with the disbursements for repairs, running the road, &c. makes the gross expenditure for the year \$584,061 77.

In this is not included the amount paid the state for tolls, \$24,639 36.

The company own 3 engine-houses; 3 workshops; 8 first class engines; 4 second do.; 4 third do.; total, 16 engines; 21 passenger cars; 196 freight and gravel cars; total 220 cars.

The number of miles run by passenger train, 136,528; do. freight, 60,000; all others, 72,000. Total, 268,528. Average speed of passenger trains, 25 miles; do. freight, 12 miles per hour. Total number of men employed, 339.

There have been two semi-annual dividends made, one of 4 per cent, Feb. 15; and one of 5 per cent, paid Aug. 15.

Auburn and Rochester Railroad.

Length of road, 78 miles; relaid in 1848 with rail 67 pounds to yard. Capital stock paid in \$2,151,765. Cost of construction... \$2,968,837 15
Indebtedness—floating debt \$60,000 00
bonds issued by co. 478,000 00

State bonds, \$200,000; less 40,000 dep. with compt... 160,100 00

Total indebtedness.... \$698,000 00

Dividends paid 5 per cent on \$2,049,300 capital stock, Feb. 1st, 1849.

Dividends paid 4 per cent on \$2,151,765 capital stock, Aug. 1st, 1850.

Receipts from 281,956 passengers... \$408,424 90
" " freight..... 111,579 72
" " mail..... 5,670 00
" " other sources..... 2,189 21

Total receipts..... \$527,863 83
Expenditures—for operating road, repairs, &c..... \$201,842 40
amount paid state toll 8,934 38
" " for int. 3,922 38

\$214,699 16

The company own one engine house at Rochester and only one half of do. at Auburn; also, 3 machine shops, 14 locomotives, 20 passenger and 100 freight cars.

The number of miles run by passenger train, 196,634; do. freight, 73,322; others, 53,345. Average rate of speed, passenger train, 25 miles, and freight, 15 miles, per hour. Number of men employed in operating road 279, and in repairing 128.

Hudson River Railroad.

Length of road in operation, single track, 75 miles. This was open for travel from New York to Peekskill Sept. 30, and to Poughkeepsie Dec. 31. The capital stock is \$3,281,500. The amount collected and paid in is \$3,157,175. The whole cost of road to present time is \$5,003,675 39.

The amount and nature of indebtedness is as follows:

Bonds issued and cash received thereon..... \$1,867,625 00
Adjusted claims due parties not called for, about..... 6,000 00
Claims for cars, engines, grading, &c., not reached maturity by term of contract..... 82,101 12

In addition to the foregoing are sundry accounts for construction the precise amount of which cannot be ascertained until completion of contracts and adjustment thereof by the engineer department.

Amounts due to the corporation:—

For instalments unpaid, less forfeited stock..... \$67,775 00
Due for unpaid subscription on bond 11,375 00
Receipts from 79,869 passengers 31,036 74
" other sources, interest, rent, &c. &c..... 46,301 63
Amount paid for engines..... 1,232 79
" " cars..... 1,286 46
" " fuel, including supply for winter... 12,765 30
" " engineers and firemen..... 1,618 91
" " oil..... 1,662 64
" " clerk hire, conductors and collectors 1,175 75
" " bag, brake, switch, and draw bridge tenders..... 5,142 17
" " horse power in N.Y. and incidentals... 2,207 76

The company has 2 engine houses, 10 locomotive engines, 25 passenger, 4 baggage, 25 freight and 40 gravel cars.

The number of miles run by passenger train, 22,345; average rate of speed, including stops, 30 miles per hour. Number of men employed in transportation service, 161.

Northern Railroad Company.

There is no part of this road in operation, excepting for purposes of construction, and for carrying small quantities of freight in connection therewith. About 30 miles of single track have been laid, mostly during the past year, with a rail weighing 60 pounds per yard.

The capital stock of this company is \$2,000,000.

The whole of which has been called, paid in..... \$1,329,517 59
Whole cost of road up to 1st Jan. '50. 1,863,291 34
The indebtedness of the company is 702,057 03
Of which, \$313,957 03 is on notes and accounts payable, and \$388,000 on bonds.

The amount due the company is \$118,094 96, exclusive of \$670,482 41 due on assessments on stock not yet paid in, a large amount of which is appropriated to purposes of construction and for road furniture under contracts. There is also due to the company from subscribers to the bonds the further sum of \$369 200.

The company own one engine house now in progress of construction, 5 engines, 2 passenger and 119 gravel cars.

Attica and Buffalo Railroad.

The length of road in operation is 31½ miles, all of which is single track, laid in '47, '48 and '49; weight of rail, 62 pounds per yard. Length of branches about 2 miles.

The whole cost of road including real estate is as follows:

Total amount reported to Jan. 1, '49. \$821,313 87
" cost of construction during '49. 49,334 69

Total cost of construction to Jan. 1, '50. \$870,648 56

Dividends due Feb. 1, 1849, on \$350,000 paid June 1..... \$17,500 00

Dividends paid 1st Aug., 1849, on \$800,000..... 36,085 00

Total dividends..... \$53,585 00

The indebtedness of the company is as follows:
 For borrowed money..... \$62,000 00
 For real estate..... 5,176 43

Total indebtedness..... \$67,176 43

The amount due the company is as follows:—
 From western roads for old iron rails, \$30,460 22
 " " " cars..... 2,852 85

Total amount due..... \$33,313 07

Capital stock, all of which is paid in, is \$800,000.

Amount charged for depreciation of

engine cars, &c..... \$22,105 40

Expenses in repairs, running roads, &c. 95,410 84

Amount of earnings have been..... 178,149 89

To wit, from passengers, 144,519 23, from freight

28,523 60, from mail 5,107 06.

The receipts from other sources were \$9,947 07,

making the total receipts..... \$188,096 29

The company own 6 engines, 7 passenger, 43

freight and 24 gravel cars; do. 1 machine shop, 2

engine houses, 1 passenger, 1 freight, and 1 horse

depot.

Tonawanda Railroad.

Length of road in operation, single track, 43½ miles.

Side track, or turn out, 2½ miles.

This road is laid with a heavy iron rail, the re-

laying was commenced in 1847, continued through

'48, and was completed in Sept., '49. About six

miles of this road is laid with rails weighing 64

pounds per yard; the remainder with rails 61

pounds per yard.

The capital stock is now..... \$1,000,000

The amount called and paid in..... 950,000

There has been expended for construction, lands,

materials, engines, cars, buildings, after deducting

for lands and materials sold, up to Jan. 1, 1849, the

sum of..... \$974,865 66

Cost of construction in 1849, engines,

cars, &c..... 191,852 57

Total cost for construction, &c..... \$1,166,718 23

Add—charged to expenses—cost of

cars..... 15,750 00

Total balance for construction.. \$1,150,968 23

Indebtedness:—

Loan from state under act May 1, '40 \$100,000 00

Bonds for money borrowed, due in '51 52,000 00

Balance on account of iron purchased 26,928 48

Other debts for money borrowed.... 16,725 00

For depot lot..... 7,500 00

Total indebtedness..... \$203,153 48

Due corporation:

Amount deposited with comptroller,

under act May 1, 1840..... \$14,250 00

Other debts for iron and other prop-

erty sold..... 55,154 67

Total amount due..... \$69,404 67

Receipts from 194,941 passengers... \$189,284 10

" " freight and storage... 60,014 63

" " mail..... 7,295 92

" " for interest..... 2,680 34

" " from other sources.... 91,256 02

Total receipts..... \$350,531 05

Expenditures for construction, repairs, running

road including state toll and salaries, &c. \$250,654-

35.

The company own two engine houses, one ma-

chine, one carpenter's shop, 7 engines, 12 passenger,

91 freight cars. Number of miles run by passen-

ger cars, 104,182 miles; average speed 22 miles

per hour; freight trains, 52,206; average speed 15

miles per hour. Number of men employed, 130.

The stock of cars is increased every year and

charged to expenses, being made in the shops of

the company, and the company deposit with the

comptroller \$1,500 per annum, to a sinking fund,

which is increasing by its interest. There have

been two dividends paid within the year, amount-

ing to \$71,000—one in July of \$29,600, and one

Jan. 1st, 1850, of \$42,000.

Troy and Greenbush Railroad.

Length of road, single track, 6 miles. Laid in

1835; weight of rail 56 pounds per yard.

Capital stock, all paid in..... \$274,400 00

Whole cost of road and equipment. 375,425 93

Indebtedness:—

Borrowed money..... \$5,133 49

For lands payable in in-

stalments at a future

day..... 5,700 00

Total indebtedness..... 10,813 49

Amount due corporation..... 4,413 70

Receipts from 205,465 passengers... 30,990 15

" " freight..... 25,107 52

" " mail..... 582 48

" " other sources..... 527 64

Total receipts..... \$57,207 71

Expenditures for repairs and run-

ning road..... 44,467 35

The company own 1 engine house and shop, 3

engines, 3 passenger, 2 baggage and 8 freight cars.

Number of miles run by passenger train, 49,126;

do. freight 7,464, others 2000. Number of men

employed, 49. One dividend of 3 per cent. was

made in February.

Albany and West Stockbridge Railroad.

Capital stock, all paid in..... \$1,000,000 00

Cost of construction, etc..... 1,930,895 01

Indebtedness of company..... 930,895 01

which amount is due the Western railroad co.

The company have leased the road to the West-

ern railroad company.

Saratoga and Washington Railroad.

Length of road in operation, single track, about

39 miles.

Laid in 1848 and '49, weight of rail 56 pounds

per yard.

Capital stock..... \$850,000

Amount called and paid in..... 781,300

Total cost of road, including \$67,-

953 03 expended prior to 1847,

about one-third of which only was

made available on a change of lo-

cation that year..... \$1,102,505 65

Indebtedness:—

For bonds redeemable March 1, 1858.. \$250,000 00

" " Jan. 1, 1855.... 84,500 00

For construction, repairs, engines, etc. 35,000 00

Total indebtedness..... \$369,500 00

Receipts from 89,643 passengers..... \$75,592 54

" " freight..... 10,426 72

" " due from mail..... 2,500 00

" " from other sources..... 950 13

Total receipts..... \$89,449 39

Expenses: including taxes and canal

tolls paid..... \$41,540 73

Amount due, about..... 4,346 09

Deduct for wood \$900, oil \$510..... 1,410 00

Total expenses of road..... \$44,476 82

Interest to bond and stockholders, from

commencement of road, about..... \$57,021 63

Salaries..... 3,662 50

The company own one brick and one wood en-

gine house, one brick shop, 6 passenger, 2 emi-

grant, 10 freight, 7 platform, and 31 rubble cars.

No. miles run by passenger train, 53,920; average

rate 20 to 25 miles per hour.

Rutland Branch Railroad.

Length about 7 miles, to the Vermont State line.

Contracts to complete the whole for a sum in gross

the present season.

There has been paid thus far towards the con-

struction of the work, in stock and bonds indepen-

dent of that and those heretofore mentioned, the

sum of \$39,890.

Chemung Railroad.

This road extends from its junction with the N.

York and Erie railroad about 4 miles north of the

village of Elmira, Chemung county, to the head of

Seneca lake, and is 1742-100 miles in length. It

is laid with the usual T rail, weighing 58 pounds

to the yard. It has been constructed during the

past season, and, although not entirely finished, is

so far completed that cars have been running over

the whole length of the road since about the mid-

dle of last December by the New York and Erie

railroad company, to which company it has been

leased for the period of ten years.

The capital stock paid in and secured to be paid

in, is \$380,000; and the whole amount, excepting

about \$5000, has been paid expended in construc-

tion of the road.

Amount expended in lands, construction of road,

and all the buildings and other apparatus, when

the same shall have been completed, (the whole

having been done by contract with a single com-

pany) will be \$450,000, which is intended to cover

the entire cost of the road and its appendages when

completed, of which \$445,000 has been paid to said

contractors. The balance still remains in the

hands of the company, to be paid according to con-

tract.

The entire indebtedness of the company is the

above balance of \$5,000, and the further sum of

\$70,000, for which bonds have been issued, secured

by mortgage on said road, payable ten years

from 10th May, 1849, with interest payable semi-

annually.

No revenue has yet been derived, nor any divi-

dends made. The New York and Erie company

have contracted to pay the Chemung railroad com-

pany for the use of the road from the date of its

completion, the sum of \$36,000 annually for the

term of ten years, in semi-annual payments; also

to pay tolls, taxes and ordinary expenses of every

description, excepting extraordinary repairs for the

first year, which are to be chargeable to the Che-

mung railroad company, and by said company to

their contractors.

Rensselaer and Saratoga Railroad.

Length of road in operation, single track. 25 miles

Weight of rail is 48 pounds per yard.

Capital stock paid in..... \$300,000 00

Cost of construction, Jan. 1, 1850.... 674,798 97

Indebtedness—Bonds issued for relay-

ing and construction..... 185,500 00

Receipts from 109,833 passengers... \$81,790 92

" " express and freights... 19,453 52

" " mail..... 870 33

" " bridge..... 6,623 03

" " miscellaneous..... 311 00

" " old materials..... 7,204 83

" " bonds..... 31,000 00

" " arrearages of 1848.... 4,955 41

Total receipts..... \$152,209 04

Expenses for construction..... \$22,888 04

" " damages, engines, cars,

etc..... 26,225 49

" " running road, etc..... 71,072 04

The company own 1 engine house, 1 shop, 4 en-

gines, 8 passenger, 2 emigrant, 21 freight cars.—

No. miles run by passenger trains 48,740, av. speed

24 miles per hour; other trains 14,233, av. speed

of freight trains 15 miles. Men employed, 56.

Skaneateles and Jordan Railroad.

Whole cost of construction, including

cars..... \$28,361 60

Deduct depreciation of property..... 13,361 60

Value..... \$15,000 00

Receipts from 6,809½ passengers..... \$1,805 52

" " freight..... 1,703 31

" " mail..... 130 00

" " other sources..... 590 60

Total receipts..... \$4,229 43

Expenses for running, and repairs to

road..... 3,229 43

Balance..... \$9,000 00

Which has been divided among the stockholders.

The company own 2 passenger and 3 freight cars,

and 7 horses. No. men employed, 5. No. miles

run by passenger trains, 8,970; by freight, 6,760.

The length of road in operation is 5-2-10 miles.

single track. It was laid in 1845. Weight of rail

10 pounds. The capital stock and amount paid in

is \$25,000.

Watertown and Rome Railroad.

No part of the road in operation. The capital

stock of the company is \$1,500,000. Amount paid

in, \$237,829 46; received for interest on deposits,

\$1,578 31; total amount, \$239,407 77.

There has been expended in construction, iron,

&c., \$321,961 39.

Cayuga and Susquehanna Railroad.

In the month of August last, the relaying and construction in part of this road was commenced, and is still in progress.

Length of road in operation, single track, is about 28 miles, which has been laid during the last three months with T rail weighing 56 pounds per yard. Capital stock—amount paid in up to

1st Jan.....	\$118,000 00
Amount expended in construction, etc.	68,011 42
Amount of indebtedness for iron, cars, etc., contracts not fulfilled.....	3,374 71
Receipts from 4,056 passengers.....	4,823 39
" " freight.....	7,888 80

The company own 2 engines, 4 passenger, two baggage, 50 freight and 10 gravel cars. No. of miles run by passenger trains, 12,480; do. freight, 7,280.

One dividend of 10 per cent on former capital of \$118,000.

Hudson and Berkshire Railroad.

Amount expended for construction, engines, cars, &c.....	\$819,631 45
Indebtedness to the State of New York, less amount paid sinking fund.....	150,000 00
To bonds issued by company.....	175,000 00
Notes and accounts.....	41,549 92
Amount due corporation, about.....	3,000 00
Receipts from transportation of passengers, 30,628.....	\$13,111 72
" " freight.....	24,315 57
" " other sources.....	400 00

Total receipts.....	\$37,827 29
Expenditures in repairs, construction and running road.....	51,626 86

The above includes all sums and liabilities incurred for the above mentioned purposes, and all salaries incident thereto, for the past year.

Amount paid for interest on bonds of company.....\$12,250 00

of interest on state debt.....8,250 00

The company own 1 engine house, 1 shop, 3 engines, 4 passenger and 40 freight cars. The company have, in addition, some freight cars which cannot be used without material repairs.

The number of men employed during the past season ranges from 120 to 31. The length of road is 31½ miles. The track, excepting switches and turn-outs, was relaid in 1848-9. Weight of rail 56 pounds per yard.

Albany and Schenectady Railroad.

Capital stock paid in, \$1,000,000.	
Amount paid for construction to Jan. 1, 1849.....	\$1,605,196 70
Amount paid in 1849 for relaying 9 miles with heavy rail, building locomotives, two freight houses at Albany, and ticket office at Schenectady.....	93,088 08

Total cost of construction Jan. 1 1850.....	\$1,698,284 78
Length of road 16 5145-5280 miles.	
Total amount of indebtedness, Jan. 1, 1850.....	\$552,000 00
Amount received from passengers.....	115,717 59
" " freight.....	62,550 00
" " rents.....	3,111 44
" " mail contract.....	2,650 00

Total income for the year 1849.....	\$184,029 05
Amount paid for repairs, running of road, etc.....	\$66,493 55
" " tolls on freight.....	8,335 60
" " Interest.....	35,909 98
" " dividends in Jan. and July.....	70,000 00

Number of miles run by passenger trains, 50,871; do. by freight do, 31,835—total, 82,006.

The company own 2 engine houses, 3 machine shops, 6 locomotives, 33 passenger cars, 27 emigrant cars, 27 mail and baggage cars, 50 freight cars and 5 horses. Average number of men employed, 130.

Buffalo and Niagara Falls Railroad.

Length of road in operation, 22 miles—15 miles laid in 1849 with rails 57 pounds to the yard, 7 miles laid in 1845 with flat rail.

Capital stock \$393,700; and called and

paid in.....	\$256,250 00
Expended in construction, etc.....	394,287 31
Indebtedness of company's bonds issued.....	\$46,670 00
Current debt.....	25,886 15

Total indebtedness.....	72,556 15
Received from 101,670 passengers.....	\$47,766 65
" " freight, etc.....	3,813 57
" " mail.....	900 00
Amount paid for construction and running road in 1849.....	170,764 76
The company own 2 engine houses, 10 passenger cars, 8 baggage cars. No. men employed, 28.	
Dividend, \$7,997 33.	

New York and Erie Railroad.

1st. Length of road in operation (including Chemung branch, 17½ miles.....)	294½
Length of single track belonging to the company.....	268
Length of double track belonging to the company.....	84
Track laid in 1849.....	96
Weight of rail per yard.....lbs.	56 & 60
2d. Capital stock.....	\$10,500,000
Amount paid in.....	5,778,891
3d. The whole cost of the road:	
Amount expended prior to resumption of the work in 1845.....	\$4,360,703 34
Amount expended under present organization.....	12,070,165 29

Expended for purchase of lands.....	\$557,096 00
Expended for grading, including brdg and masonry.....	5,883,242 47
Expended for engineering.....	307,736 31
Expended for iron for superstructure.....	1,734,373 50
Expended for buildings.....	270,273 89
Expended for engines.....	402,322 88
Expended for passenger cars.....	98,011 97
Expended for freight cars.....	287,238 18
4th. Funded debt.....	\$5,839,918 90
Floating debt.....	2,481,647 41

Due to corporation.....	\$23,507 12
5th. Number of through passengers.....	12,303
Number of way passengers.....	370,359½
6th. Rate of fare, first class passengers per mile.....	cents 2
Rate of fare, second class passengers, per mile.....	1
7th. Amount received from transportation of passengers.....	\$363,209 96
Amount received from transportation of property.....	425,078 12
Amount received from transportation of mails.....	21,489 42
Amount received from rents.....	366 12

Total.....	\$810,143 62
8th. Amount of freight:	
Products of the forest.....tons.....	10,468
Animals.....	27,480
Vegetable food.....	9,377
Other agricultural products.....	670
Manufactures.....	12,128
Merchandise.....	32,263
Other articles.....	17,076

Total.....	109,402
9th. Amount paid for construction in 1849.....	\$4,818,142 27
Repairs of roadway and buildings.....	\$61,640 44
Repairs of locomotives and cars.....	64,030 53
Engine men and firemen.....	34,351 61
Oil, waste, etc.....	27,654 33
Conductors, baggage and brakemen.....	40,091 53
Fuel and supply of water.....	60,559 91
Salaries of agents, clerks and office expenses.....	39,307 79
Labor, loading and unloading, and watchmen.....	47,152 37
Contingencies.....	24,658 59

Total for transportation expenses on road.....	\$399,548 09
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Hudson River Ferry—

Repairs and supplies of steamboats and expenses of Captain and crew... 100,379 12

NOTE.—These expenses include provision for accommodations which are competent to do a much larger business than has been done the past year.

Proportion of receipts from transportation belonging to ferry.....	\$70,066 25
10th. Number of engine houses and shops.....	9
Number of engines.....	50
Number of passenger cars.....	39
Number of express and baggage cars.....	12
Number of freight cars.....	448
Number of gravel cars.....	90
11th. Number of miles run by passenger trains.....	303,961
Number of miles run by freight trains.....	343,782
Number of miles run by other trains.....	96,000
Average rate of speed for passenger trains per hour.....	22
Average rate of speed for freight trains do.....	12
12th. Dividends:	
Three per cent. interest on stock 1st Jan.....	\$125,752 45
Three per cent. interest on stock 1st July.....	165,843 38

New York and Erie Railroad.

We give below the report of the directors of this road recently submitted to the public. It will be seen from it that the completion of the road at a very early day is now past doubt, and that its financial prospects are of the most flattering kind.

ADDRESS.

Since the report of the board of directors to the stockholders, in March last, additions have been made to the completed portion of the road, so important as to require a further statement from us of the condition and prospects of the work. We have now reached that point in its progress where we can almost catch a glimpse of the shores of Lake Erie; and, in our view, but one more determined effort is wanting to bring this great enterprise to a successful termination. This effort, the board of directors are determined to make, and they cordially invite the stockholders, and other friends of the road, to co-operate with them for this object.

The road from Binghamton to Owego, 22 miles, was opened in June last; from Owego to Elmira, 36 miles, about the middle of October; to Corning, 18 miles, on the 1st of January; and the branch road to Newburg, about two weeks since. These additions are rendered far more important from the fact that they bring us in connection with other public communications tending to add largely to the receipts of the road.

At Owego we intersect the Cayuga and Susquehanna railroad, extending 29 miles to Ithaca, whence it connects, by steamboats, with the Central railroad, at Cayuga Bridge, thus opening the extensive country bordering on Cayuga Lake to the most cheap and speedy communication, by this road, with the city of New York. The plaster beds on the shores of this lake, and the Salt Works of Onondaga, will furnish large additions to the business of the Erie road.

At Elmira we intersect a railroad running 18 miles to the head of Seneca Lake. A single glance at a map of the country will show the importance of this connection. By this road and the steamboats on Seneca Lake, (which is never frozen) we have a direct communication with Geneva and the other cities and towns on the great central line from Albany to Buffalo. As was remarked in our last report, this link was deemed so important to the interests of the Erie railroad, that at an early day, for the purpose of insuring its completion and proper management, your board made arrangements for leasing it for an extended period. It has now been in partial operation for a few weeks, but in consequence of its incomplete state, has not yet been accepted by the board. Its results, however, are already beginning to be felt, and we confidently believe that the receipts from this connection, after the present month, will be larger than we have, until quite recently, dared to anticipate.

At Corning, we connect with the Corning and Blossburg railroad, extending forty miles, to the bituminous coal and iron fields of Pennsylvania. From this connection, a large and increasing business will be derived.

We have heretofore estimated that on the completion of the road to Binghamton, its receipts would amount to \$1,000,000 per annum, and that they would amount to \$1,500,000, when completed to Elmira.

The full benefits of the different connections have not yet been fairly developed. Every person acquainted with the management of railroads, will readily understand that some little time is necessary for the business of the country to adapt itself to these new channels. An unavoidable delay occurred in procuring the machinery necessary for running the new portions of the road, and the late epidemic reduced its receipts nearly one-half for fully three months; yet under all these discouraging circumstances, we consider with great satisfaction the results which have been achieved the past year.

It will be recollected that, in our last report, we stated that the road would be in good running order to Binghamton by the 1st of April. From causes above referred to, this period was somewhat delayed. It will be seen, however, that notwithstanding these influences, the business of the road has fallen but a trifle, if any, short of the estimates heretofore made.

The earnings for the past year have been as follows:

January.....	\$39,340 98	August....	70,024 66
February.....	43,505 22	September..	77,688 45
March.....	50,073 07	October....	100,720 57
April.....	62,123 24	November..	88,052 24
May.....	66,066 67	December..	94,315 75
June.....	60,320 02		
July.....	57,546 63		

Making an aggregate of \$809,777 50. It will be seen that the receipts of the road from the 1st of April to the 1st of January were \$676,858 23, thus falling but \$73,000 short of the estimate of the receipts on completion of the road to Binghamton. With the communication with Seneca Lake incomplete, at times wholly interrupted, the receipts the present month will amount to about \$100,000, and there is every reason to believe that during the succeeding months of the year they cannot fall below an average of \$125,000. After the 1st of September we shall receive a further income from the road west of Corning.

The board of directors have the satisfaction of further announcing to the stockholders that the 42 miles of road-bed between Corning and Hornellsville have been put under contract, for cash, and that the rails for the same are already purchased, a part of them shipped, and the remainder in the process of shipment from England—and that the whole 42 miles will be opened and in practical operation on the 1st of September, ensuing. They have also advertised for proposals for completing the road from Hornellsville to Lake Erie.

The present condition of the company may be briefly stated as follows:

Amount of stock issued.....	\$5,778,891
State mortgage bonds.....	3,000,000
Mortgage of '59.....	4,000,000
Certificate of old indebtedness.....	500,000
Other indebtedness, payable in 1850 and 1851.....	1,150,000

Total.....\$14,428,891

It will be proper here to exhibit an estimate of the additional amount necessary to complete the road to Lake Erie. From surveys originally made by Major Brown, and subsequently carefully examined by S. Seymour, Esq., it is found that the sum required for this purpose amounts to \$2,750,000. The extension to Hornellsville, as before remarked, has already been contracted for with responsible parties, at a sum considerably within the estimate of the engineers, and from the fact that near one million of dollars have been expended for grading and masonry west of Hornellsville, we cannot doubt that full reliance may be placed on these estimates. It should be borne in mind that west of Corning the route is through a country exceedingly favorable for constructing a railroad, and that there is little or no heavy work to be done.

It remains now to ascertain what further obligations the company will necessarily have to provide for during the time proposed for completing the road, and the resources remaining applicable to that object:

Interest on \$4,000,000 at 7 per cent. ('59).....	\$280,000
Do, do 500,000 at 7 per cent. (certificates, '54).....	35,000
Do, do 5,778,891 at 6 per cent. (stk).....	346,733
Do, do 1,150,000 at 7 per cent. ('50 and '51).....	80,000

Total.....\$742,233

The interest on the state mortgage of \$3,000,000 is already deposited with the Comptroller up to the period of the proposed completion of the road.

The gross receipts of the road for the present year are estimated at.....	\$1,600,000
Expenses.....	800,000

Net income.....\$800,000

or \$58,000 more than sufficient to pay all demands for interest, that can be brought against the company, including six per cent. payable on the stock.

The board have had under their consideration several plans for the completion of the road; but they mostly involved in a greater or less degree a sacrifice on the remaining stock of the company.—This sacrifice would necessarily have depreciated the stock already issued, and would have caused dissatisfaction among the stockholders.

Your board would here remark, that they have yet to find the first man, however timid or hostile, who doubts the overwhelming success of the Erie railroad when completed to Lake Erie. The only difficulty suggested is that it may never be completed. If, as we contend, there is no doubt of the triumphant success of this road when it reaches Lake Erie, and it, as we further contend, this result can be obtained in fifteen months from this period, and at an additional expenditure of less than \$3,000,000, then, in the opinion of your board, there can be no question of the feasibility of the plan we are about to recommend.

We propose to issue three millions and a half of income bonds, bearing interest at 7 per cent. payable half yearly, redeemable at the pleasure of the company within five years. For the payment of the interest and principal of these bonds, we pledge the entire income of the road, after the 1st of July 1851, until the net earnings shall reach \$1,200,000, reserving only a sum sufficient to pay the interest on the mortgage bonds. This we propose, confident in the belief that the receipts, on the completion of the road, will be more than this sum per annum, which would be alone sufficient to pay the interest on the debts of the company at that period, of every nature, and six per cent. dividends to the stockholders.

On the completion of the road to Lake Erie, the gross receipts cannot be less for the first year than \$3,000,000, and the second year, \$3,500,000. To show that these estimates are by no means extravagant, the following calculation is submitted.—We take for illustration, the receipts for the month of October, from Piermont to Owego, a distance of 222 miles. The road being then in operation and in good running order, the gross earnings were \$100,000. Take now the distance from Owego to Lake Erie, which is 222 miles, and allow that this division of the road will be only as productive as the eastern portion, and leave out of the account entirely the vast amount of freight and passengers from beyond and bordering the lakes, and we have the following results:

Receipts per month, to Owego, 222 miles.....	\$100,000
Giving per year.....	\$1,200,000
Receipts between Owego and Lake Erie (same distance) per month.....	\$100,000
Making per annum.....	\$1,200,000

We have now only to allow that the freight from beyond Owego shall be destined for New York, and of course that it runs over the eastern half of the road, and this amount is dou-

bled.....1,200,000—\$2,400,000

Giving the sum of.....\$3,600,000

We also leave out of account the fact that the history of every railroad shows a large increase in the receipts from year to year. This is so universally the case, that it will hardly be necessary to so more than glance at the following statistics, from the report of the Western Railroad from Worcester to Albany:

1842, first year of its opening to Albany..	512,688
1844.....	753,752
1848.....	1,332,068
or nearly 50 per cent. interest in two years, and about 260 per cent from 1842 to 1848.	
Estimated receipts first year of the opening of the road to Lake Erie.....	3,000,000
Expenses.....	1,500,000

Leaving net income.....\$1,500,000

To be applied as follows:

Interest on mortgage bonds ('59-'67).....	\$490,000
Interest on proposed income bonds.....	245,000
Interest on other indebtedness at completion of the road, say \$1,000,000.....	70,000—\$805,000

Leaving.....\$695,000

or near 12 per cent. dividend to the stockholders.

Estimated receipts second year.....	\$3,500,000
Expenses.....	1,750,000

Net.....\$1,750,000

Interest on indebtedness of all descriptions.....	805,000
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Leaving.....\$945,000

or over 16 per cent. to the stockholders.

If your board are not unreasonable in these estimates, then long before the close of the second year of the running of the road the stock will be sought for and made available at par, for a redemption of a portion of the indebtedness of the company.

In view of the facts and estimates herein set forth, the board cannot doubt that the securities about to be offered will be received by the public with confidence. It will be noticed that we have made no reference to projected lines of railroads designed to connect with us, several of which will doubtless be completed within the next 5 years.—Among them may be named the following: From Buffalo Hornellsville, from Rochester to Corning, from Auburn to Ithaca, from Cleveland to Dunkirk, and the Liggett's Gap road, connecting the Erie road with the anthracite coal regions of Pennsylvania.

When a few years more shall have elapsed, and time is given to bring about results yet necessary for the full development of the resources of the Erie railroad, the public will regard with astonishment the impediments which have been suffered to retard its progress. With trains of cars leaving Piermont and Lake Erie at all hours of the day, connecting with numerous railroads made and making between the Hudson river and the Lake, and there connecting with other roads running to Cleveland, Detroit, Chicago and Galena, all freighted with the productions of the boundless west—who can doubt the destiny of this great work, and its influence on the wealth and prosperity of the city of New York.

There is yet another consideration: It is a fact peculiar to the Erie railroad that it passes mainly through a country yet in its infancy. Every forest that is cleared, every house that is built, and every additional acre of land that is cultivated on its borders, will increase the business of the road. It is by no means an extravagant idea to suppose that the population of the country bordering on this road west of the Delaware, and embracing an extent of fifty miles on each side, will be doubled within ten years from this period.

Your board would remark that they have no greater interest in this road than other stockholders; but as citizens of New York, they feel a pride in its success; and there is not a member of the board who would not esteem it a great misfor-

tune should its progress be obstructed by any cause. They have never yet, in the darkest period of their experience in the prosecution of this great work, for one moment faltered in their confidence of its triumphant success. They have stood by it, unmoved and undismayed, when enemies have predicted its failure and when friends have proved faint-hearted. They have freely given to it their time, their money and their credit, with no hope of reward, other than the satisfaction of having faithfully served your interests. This they are conscious of having done, to the best of their abilities, and this they will continue to do, so long as they may direct the affairs of the company.

By order of the Board of Directors,
NATHANIEL MARSH, Sec'y.
Office N. Y. and E. RR. Co., New York, Feb. 1, 1850.

* It will be borne in mind that the state of New York gives a bonus to this work..... \$3,000,000
Stockholders surrendered their stock to meet the requirements of the State Law, of 14th May, 1845; granting the above bonus..... 736,400
Aggregate amount surrendered..... \$3,736,400

Fitchburg Railroad.

The annual meeting of this company was held on the 29th ult. The annual report of the directors was published in advance of the meeting, from which we present the following synopsis:

The total amount of the capital stock of the company is now \$3,320,000. The total amount charged to construction account, up to Dec. 31, 1849, is as follows, viz:

Main line.....	\$2,769,454 26
Cost of extension into Boston.....	427,439 21
Watertown branch.....	166,157 33
Lancaster and Sterling branch.....	82,740 85
	\$3,445,791 65

Showing an excess of cost over the capital stock of \$125,791 61.

Debts and Liabilities of the Corporation.

Total amount of notes payable and sundries.....	195,255 74
Other indebtedness.....	30,093 11
Dividend, No. 10.....	107,000 00
Total amount of debts and Liabilities.....	331,348 85
Deduct available means, as below.....	264,163 45
Balance over available means.....	67,185 40
Estimated amount required to settle up everything on the second track, main line, &c., (a large estimate).....	30,250 00
Estimated amount required to settle up everything on the Lancaster and Sterling branch, (a large estimate).....	34,242 00
Balance over available means including the above estimates.....	\$131,677 40

Available Means of the Company.

Cash on hand Jan. 1, 1850.....	\$85,494 92
Assessments on new stock, due Jan. 1, 1850.....	50,220 00
Uncollected mails, rents, freight, &c.....	25,792 47
Notes receivable for lands and sundries.....	11,749 04
Sundries.....	5,440 57
Real estate, consisting of buildings and land in different towns, as per valuation in Treasurer's books, not needed for the railroad, and to be sold as opportunity offers.....	33,967 30
Stock on hand for repairs and paid for.....	24,011 08
Wood and oil on hand and paid for.....	28,188 07
Total amount of available means.....	\$264,163 45
Estimated Value of Company's Property, exclusive of Available Means.	
Cost of extending the road into the	

city of Boston, including passenger house, land for the same, street bridge, repairing Warren bridge, engine house, &c..... \$427,439 21
Valuation of the assessors of Charlestown of depot, lands above Warren bridge, [exclusive of what is used for the railroad tracks] including Machine shop, freight houses, car houses, &c..... 562,500 00

The quantity of land and wharves above Warren bridge, is 652,139 square feet, with a wharf front of 2,200 feet in length. Besides this long wharf owned by the company our double track extends on to and over the four large and commodious wharves below all the bridges, where vessels of the largest class can lay afloat at low water and take in cargo directly from the cars.

Watertown branch railroad, being the cost of the same.....	106,157 33
Lancaster and Sterling branch, being the amount expended on the same to December 31st, 1849.....	82,740 85
Estimated value and cost of the main line of railroad from Boston to Fitchburg, not included in the above items, but including the purchase of the Charlestown branch railroad and improvements of the same....	2,466,192 89

Total value of the above.....	\$3,725,030 28
Deduct from this the actual cost of the above to this company, being the entire amount charged to construction account to January 1, 1849.....	3,445,791 65

Excess of value over cost..... \$280,238 63
This excess of value over the cost of the above property is on the company's lands in Charlestown which were purchased at a very low price mainly from the Charlestown Wharf Co., who were about winding up their affairs at the time the railroad corporation came into existence. It will be observed that the valuation of these lands is the valuation of the assessors of the city of Charlestown.

Earnings and Expenses.

Income from passengers.....	213,067 95
Do freight.....	262,161 93
Mails, rents, miscellaneous.....	17,830 55
	\$493,060 43
The expenses of operating road and branches, '49.....	263,520 51
Due other roads.....	18,700 54
Dividends.....	212,000 00
Gratuities, damages, etc.....	14,786 27
	245,466 81

Balance to contingent fund.....	18,033 70
Contingent fund, 1849.....	40,573 55
Total contingent fund, 1850.....	\$58,606 25
Number of miles run by passenger trains, 1849.....	296,973
Do do Freight, 1849.....	102,157
Do do Gravel.....	18,742

Total miles run, 1849.....	347,872
Do do 1848.....	301,975
Increase of 1849 over 1848.....	miles 45,897
Total earnings, 1849.....	493,060 43
Do 1848.....	418,680 11

Increase of earnings over '48.....	\$74,380 32
Total Expenses, 1849.....	229,539 92
Do 1848.....	174,275 17

Increase of expenses.....	\$55,264 75
Number of passengers carried in the cars, 1849.....	875,410
Number of passengers, 1848.....	655,917
Increase of 1849 over 1848.....	219,493
Number of passengers carried one mile, 1849.....	13,023,053

Do do 1848.....	10,065,728
Increase of 1849 over 1848.....	2,957,325
No. of tons of freight carried one mile, 1849.....	6,385,507
Do do 1848.....	5,481,945
Increase of 1849 over 1848.....	903,562
No. of tons of freight carried in the cars, 1849.....	287,032
Do do 1848.....	255,404
Increase of 1849 over 1848.....	31,628
Of the above freight carried in the cars, 1849... were ice and bricks.....	105,848 tons.
Ice and bricks, 1848.....	87,537 tons.

Increase of 1849 over 1848.....	18,311 tons.
Length of double track main road.....	50 miles 93-1000ths.
Length of single track of branches.....	15 miles 5-1000ths.
Length of turnouts, on main road and branches, including tracks around Fresh and Spy Ponds for the ice business.....	11 miles 91-1000ths.

Total amount of miles of iron laid in main road branches and turnouts..... 127 miles 146-1000ths.
Cost of running the road and branches per mile in 1849, has been 65 and 97-100ths. cents.

The Fitchburg is justly regarded as one of the most fortunate and best managed of the Massachusetts railroads; and its stock is the highest of any of her roads in the market, with the exception of the Boston and Lowell.

Massachusetts.

Boston and Worcester Railroad Corporation.

Annual Meeting.—The annual meeting of the stockholders of the Boston and Worcester railroad corporation was held at Assembly hall, Albany street, Wednesday, February 6th, the president in the chair. The meeting was very full. The president submitted the annual report which was accepted.

The old board of directors, consisting of Messrs. Thomas Hopkinson, David Henshaw, Daniel Denny, Nathaniel Hammond, Benjamin F. White, George B. Blake, Timothy C. Leeds, William Parker, and Isaac Emery, was declared to have been re-elected by nearly a unanimous vote.

After much debate the following votes, offered by P. T. Homer, were carried.

Voted, That the meeting receives with satisfaction the announcement in the annual report of a probable reduction in the expenses of the coming year.

Voted, That it recommends an early sale of the surplus land belonging to the corporation, and objects to any further addition to its real estate.

Voted, That the names and pay of each officer receiving an annual salary, in the employ of the corporation, be given in the next annual report.

Voted, That a record be made of all free passes granted upon the road, by whom given, by whom used, and the number of times used, and that the same be published in the annual report.

Mr. T. C. Leeds offered the following resolutions:—

Voted, That the application to the legislature for an increase of capital stock, as stated in the directors' report, be approved.

Voted, That the directors be authorized to issue the bonds of the corporation to an amount not exceeding \$500,000, payable in not exceeding ten years from date.

Mr. Wood, of Somersworth, offered the following amendment—"and that the directors be instructed to close the construction account as soon as possible," which was carried.

The president stated in answer to a question, that one gentleman had offered to take the whole amount of bonds at one per cent. premium, and perhaps he might at two per cent.

The subject of free passes was debated at considerable length. The subject was finally referred to a committee of four, consisting of Messrs. P. T. Homer of Boston, John B. Wood of Somersworth, Charles Woodbury and Frederick Emerson of Bos-

ton, and George W. Richardson of Worcester, who are to consider the whole question and report at a future meeting.

The meeting then adjourned to meet the first Wednesday in April at 10 o'clock, A. M.

AMERICAN RAILROAD JOURNAL.

Saturday, February 9, 1850.

Hague St. Steam Boiler Explosion.

Our readers have doubtless been made familiar with the leading facts connected with the melancholy explosion which took place in this city on the 2nd inst. What now most concerns the public to know, and especially the people of this city, in which are hundreds of engines at work, and for ought we know with the same liability to disaster as the one which recently exploded, are the causes which led to it. These are now undergoing investigation by a jury of inquest. In our next we shall give the material part of the evidence, which thus far seems to be but little more than mere matter of opinion.

Resistance from the Weight of Railway Wheels, &c.

BY E. F. JOHNSON, C. E.

"Every point in the circumference of a wheel describes a curve called a cycloid, and assuming that the lengths of the curves described by the intermediate points, between the circumference and centre, decrease in length in proportion to their distance from the circumference, the length of a cycloid, being four times the diameter of the generating circle, the mean velocity of the matter in the wheel, supposing it to be a solid cylinder, will be

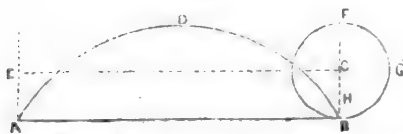
$$\frac{4+3.1416}{2} = 3.57$$

the velocity of the axis being 3.1416, hence, the power to keep the same wheel in motion, is to the power to keep the quantity of matter collected at the axis in motion as 1:137:1 or a little more than one eighth greater."

The above is taken from Tredgold's "Practical Treatise on Railroads and Carriages," and is presented here for the purpose of pointing out an error which it contains.

It is true that when a circle as FGB, Fig. 1, revolves upon a plane as AB, any point in the circumference as B will in one revolution describe a cycloidal curve ADB, equal in length to four times FB, the diameter of the generating circle, the centre of the circle passing at the same time, through a distance EC or AB equal to the circumference.

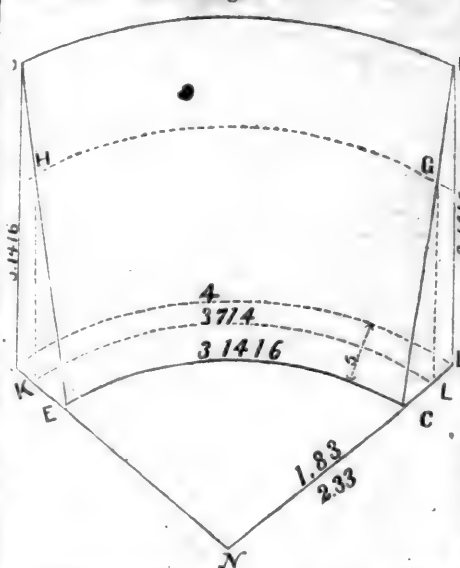
Fig. 1.



It is true also, that the velocities of the several points in the circle, will be increased uniformly from the centre to its circumference. But it is not true that the mean velocity of all the points will be equal to the mean of the two extreme velocities, and for the reason, that the number of points or indefinitely small portions of the wheel, having a velocity exceeding the mean 3.57 (the diameter of the circle being called 1,) is three times that of the number having a velocity less than 3.57.

One mode of ascertaining the true mean velocity, of the several points or particles which make up the area of the circle may be illustrated as follows:

Fig. 2.



Suppose AB and EC, Fig. 2, to be concentric arcs of circles having a perpendicular distance from each other equal to the radius (0.5) of the wheel; the arc AB to be equal to four times the diameter of the wheel or 4, and the arc EC equal to its circumference = 3.1416. These arcs will represent respectively the velocities of the points in the circumference and at the centre of the wheel.

If now from the point B, a line BF be drawn perpendicular to the plane CABE, and equal to the circumference of the wheel (3.1416) it will contain the same number of points or indefinitely small particles as the circumference, and if these particles, or their equal, the line BF, be multiplied by their velocity, or the line BA, the product which is their momentum, will be represented by the curved rectangle ABFD, AD being supposed equal and parallel to BF.

Draw ED and CF. The triangles ADE and CBF, contain each the same number of particles, or have an equal superficies with the wheel whose diameter is 1, and if any line as GL be drawn parallel to FB, it will contain the same number of particles, as the circumference of a circle on the wheel whose radius is equal to CL, and the momentum of those particles will be shown or represented by a curved rectangle GHKL parallel to ABFD.

The same may be said of any other line in the triangle CBF drawn parallel to FB, and the rectangles which can be formed from the several lines, which make up the triangle CBF constitute the solid CBFDAE; hence that solid is a true measure of the momentum of the particles composing the triangle CBF, or of the wheel to which it is equal.

If now the said solid CBFDAE, be divided into two equal parts by the curved rectangle KLGH drawn parallel to ABFD, then the momentum of the particles on each side of the line GL will be equal one to the other, and KL which is the trace or intersection of the dividing rectangle upon the horizontal plane ANB will be a measure of the mean velocity.

By making the requisite computations, the line KL or the mean velocity will be found equal to 3.714, which quantity, inasmuch as the momentum of matter is expressed by the product of the mass into the velocity, is also equal, to the whole momentum or solid CBFDAE, divided by the area of the triangle CBF, or its equal; the area of the wheel which ex-

presses the whole number of particles in the wheel.

From the above it appears that the relation of the velocity of the centre of the wheel or cylinder, to the mean velocity of the matter in the same is as 3.1416 to 3.714 or as 1 to 1.182. Hence,

"The power to keep the wheel in motion, is to the power to keep the same quantity of matter collected at the axis in motion" as 1.182 to 1, or nearly one-fifth greater, instead of one-eighth as Tredgold has it.

The above is the result upon the supposition that the wheels are cylindrical, whereas the usual form is such, that most of the matter in them is collected near the circumference. This peculiarity of form is such as appears from a measurement of the wheels of several passenger cars having a diameter of 2½ to 3 feet as to increase the momentum to between one-fifth and one-fourth or 20 to 25 per cent. The wheels of railway cars, being made fast to the axles the latter have their momentum increased in consequence, but as the matter in them is near to the centre of rotation, the increase is not much, enough however, to make the increased momentum of the wheels and axles, taken together, equal to about twenty-three per cent for wheels three feet in diameter constructed with spokes in the usual manner.

If therefore the speed of a car on the road with such wheels is thirty miles per hour, the wheels and axles will have a motion of 37 miles per hour. If the wheels and axles constitute one half of the whole weight the average motion will be 33½ miles per hour, and if only one fourth 31½ miles per hour. Hence, the apparent paradox, that the motion or momentum of an empty car is greater according to its weight than that of a loaded car, in the same train. Hence also the fact, that the momentum of a passenger train is greater than that of a loaded freight train of the same weight and rate of motion.

It follows from the above, in regard to the construction of the wheels of railway cars that no more material should be put into the tread or rim of the wheel, than is absolutely essential to give to that particular part the requisite strength. Whatever is required for the wheel itself, should be applied as near to the axle as possible.

This arrangement renders the momentum less, and of course diminishes somewhat the resistance, and adds to the facility of managing the train in a corresponding degree.

The Lightening,

Is the name of a new locomotive of extraordinary speed and capacity, recently built at Norris's Locomotive Works, Schenectady, for the Syracuse and Utica railroad. As she has proved herself to be an engine of remarkable power, the following brief description will be a matter of interest:—

Her cylinders are 16 inches diameter, 22 inches stroke, placed horizontal, midway of the cylindrical part of the boiler. One pair of driving wheels 7 feet in diameter are placed immediately under the fire door. In front of the fire box are placed a pair of bearing wheels, 4 feet in diameter. The boiler is supported in front by four wheels of 31-2 feet diameter, in a truck. The eccentrics are placed on the outside of the wheels, attached to the crank wheel. Her valves are worked direct, without the intervention of a rock arm. She uses her steam expansively from 1-8 to 7-8 of the stroke of the piston, always preserving the same lead as when working at full stroke. Great care has been taken to prevent the condensation of steam before it enters, and while doing its duty, and in the cyl-

inder. The wheels were manufactured by the Messrs. Norris of solid wrought iron; the spokes, hub and rim, all in one solid mass. She was built at Norris' Locomotive Works, Schenectady, by Edward S. Norris, after a plan furnished by Septimus Norris. Her power, as a daily duty, is 600 passengers, 60 miles per hour.

Her boiler contains 116 tubes, 2 inches diameter, 10 feet 3 inches long; fire box outside; measures 5 feet by 3 1-2 feet; water spaced all around three inches. The boiler stands 5 feet 4 inches above the surface of the rail. She has a beautiful brass lever clock—a new plan for ascertaining the height of water in the boiler, shown in a glass tube; also a small hand lantern; an odometer attached to the wheel for registering the number of revolutions of the driving wheels; also a contrivance for adjusting any desired transfer of weight from the driving wheels to the bearing wheels.

The cost of this machine, we understand, is \$15,800.

She recently made the trip from Utica to Syracuse, a distance of 53 miles, with a train of six 8-wheel cars, against a strong head wind, in 60 minutes. Her running time was 54 minutes—a feat we believe that has never yet been equalled in any part of the world.

The enterprising builders, we are happy to learn, are prosperously and extensively engaged in the manufacture of railroad equipments. They have extensive shops with every facility for carrying on work on a large scale, and they now employ between 200 and 300 men. Of the character of their work, the above described engine is the most satisfactory evidence that can be given.

Since the above was written, we have been favored with a more particular description of the engine which we give below:

"The boiler measures 5 feet length of fire box-shell 42 inches wide; waist of boiler 10 feet 3 inches long, 42 inches diameter, containing 116 tubes 2 inches diameter. Fire box 4 feet 6 inches long, by 36 inches wide and 54 inches high. Smoke box circular 26 inches long.

Frames, main ones, 6x1 1/2, set edgewise; outside frames, 4x1 1/2, set edgewise. To the main frames are welded pedestals, the jaws of the driving wheels standing above the frame, and the jaws of the bearing wheels below the frame. These frames are securely braced with iron 3x1, running the entire length. The outer frame has also a pedestal attached by a jaw, above the frame, which serves to float the outside bearing of the crank pin, to which is attached the two eccentrics on each side east in one piece for backward and forward motion.

Wheels, driving wheels, 7 feet in diameter, with flanges, are placed immediately behind the fire box, and below the fire door, the axle of which is covered in connection with the engineer's stand. The bearing wheels are 4 ft in di. and are immediately in front of fire box. These wheels are used for transferring the weight from off the drivers by means of a lever, which has semi-circular notches cut in to receive a moveable fulcrum attached at both ends with the springs over each end of axle, and the other links from spring attached to main frame. The truck, which is made of five sheets of 3-8 boiler plate, separated by 3 in. of oak, securely fastened to iron, and between which is placed the spring, vibrating on its centre, and each end resting upon top of boxes or bearings for journals of wheels. These wheels are 4 in number, of 3 1-2

feet diameter. The frame rests on top of the truck on rollers to let it traverse easily with little friction. All the wheels are manufactured of solid wrought iron, the spokes, the hub, and fellows, or rim are all one solid piece of iron; the first ever attempted to be manufactured in this country, and they were made with the ordinary forge hand hammer without the use of a tilt hammer.

The cylinders are 16x22 placed midway of cylindrical part of boiler, firmly secured and braced to main frame and boiler, and cross braced by the exhaust pipe running from cylinder to cylinder under boiler, then branching off to smoke box, where the escape steam exhausts itself in the chimney through a variable exhaust opening which can be decreased or increased at pleasure from the engineer's stand.

The valves are worked direct from eccentrics, all placed outside with a return crank all in one, with crank pins corresponding with centre of driving shafts. The ends of eccentric rods are attached with a joint to a segment of a circle formed of two parallel plates, which is suspended from a fixed centre by 2 links on each side. Between the plates the valve rod is allowed to play up and down to change the motion of the valves and reverse the engine; and the valves are so arranged as to effectually cut off the steam at any desired stroke of the piston, from 1-16th to 15-16ths. The steam is supplied to the cylinders from a large dome surmounting the cylindrical part of the boiler, the centre of which corresponds with the centre of cylinder, by means of 2 branch pipes communicating with the cylinder. The throttle valve is placed at the top of this dome, and is worked by a lever passing through the boiler to the engineer's stand. Over the fire box is placed a handsome brass dome and escape pipe, underneath which is placed the safety valve and lock up valve. On top of large brass dome is placed the whistle of large dimensions and deep tone.

In front of engineer's stand is a brass lever clock, and attached to driving wheel is an Odometer for registering the number of revolutions of wheels. Every part of cylinder and boiler, dome, etc. is first caased with felt, then with wood and iron bands, and then with Russia iron or brass. Weight of engine in running order with wood and water, 44,700 lbs. Power on grades of 26 feet per mile, 600 passengers, 60 miles per hour.

The best performance ever made from Utica to Syracuse, a few days ago, with six 8-wheel cars, running time 54 minutes; distance 53 miles.

Her quickest time made is 16 miles and 88 feet in 13 minutes and 21 seconds, with eight 8-wheel cars. This was done Feb 2.

Virginia.

Tunneling the Blue Ridge.—The Staunton (Va.) Indicator states that the contract for tunneling the Blue Ridge, was taken on the 21st ult., by Messrs. Reilly & Co., of Maryland, for the sum of \$190,000. The work will be commenced immediately.

Maine.

Railroad Meeting in Bangor.—An adjourned meeting of the friends of the Kennebec and Penobscot railroad was held at Bangor on the 6th instant and was very numerously attended. It was addressed by Judge Preble, F. O. J. Smith, and John A. Poor, of Portland; and by A. G. Jewett, of Bangor. The utmost enthusiasm prevailed, and we soon expect to see the great eastern line of railway take another start, which will carry it to Bangor, and ultimately to the British provinces.

New Publications.

DICTIONARY OF MECHANICS, ENGINE WORKS AND ENGINEERING: D. Appleton & Co., N. York.

We have rec'd the first three numbers of the above work, of which a minute description will be found in an advertisement in another column. A work of this kind, embodying in a cheap and convenient form the results of mechanical and engineering discovery and experience, is a great desideratum. From the brief examination we have yet been able to make of it, this desirable object seems to have been accomplished. It is got up in a good style, and as it only professes to be a work of compilation; if the authorities quoted are accurately copied, which we have no reason to doubt, it is a very valuable work, and should form a part of the library of every individual.

Ohio.

Cleveland, Columbus and Cincinnati Railroad.—On Saturday last, the annual election for directors for this road took place at their office, in the Weddell. **ALFRED KELLEY** was elected President.

JOSEPH RIDGWAY, Jr.,
LEONARD CASE,
JOHN M. WOOLSEY,
W. A. OTIS,
RICHARD HILLIARD,
JONATHAN GILLET,
GEORGE MYGATT,
H. B. PAYNE,

Directors.

All connected with this work are men of ability and energy, and under their management, it will be completed by the first of December next.

We understand that nearly two-thirds of the distance from Wellsville to Columbus is graded.

Next spring men will commence laying down rails at both ends of the road—and in the middle, too, if necessary. The iron will all be ready.

Valuable Discovery.

It has been discovered in England that the golden sulphuret of antimony mixed with India rubber, and submitted to the action of heat at 280 degrees, in a boiler, under pressure, from four to six hours, will produce what is known as metallic rubber, after which the goods will resist the action of extremes of heat or cold, yet retain for an indefinite time a much greater degree of elasticity than those produced by the melting of sulphur with lead mixed with rubber. Fabrics prepared according to this invention can be made to take all the most delicate tints of color, quite free from the odor of sulphur, so objectionable in other modes of vulcanising. Mixed with gutta percha, images, the entire features of the face, which are capable of being distorted into innumerable and grotesque forms, have been produced. Overcoats have been made by this process, to weigh but twenty-two ounces, and capable of being crammed in the pocket. A single thread of the elastic fabric, no larger than a knitting-needle, suspended the weight of fifteen pounds, after being stretched nine times its quiescent length, so strong is the substance after being submitted to the process. It is said to be the most valuable discovery yet made in connection with India rubber.—*N. Y. Courier and Enquirer.*

Brown's Old Established SCALE WARE HOUSE,

NO. 234 WATER ST., NEW YORK.

THE Subscriber, Practical Manufacturer of Scales of every description, respectfully asks the attention of Railroad Companies to his Improved Wrought Iron Railroad Track and Depot Scales which for strength, durability, accuracy, convenience in weighing, and beauty of workmanship, are not surpassed by any others in this country.

He is aware that this is rather a bold assertion for him to make, yet he can say with confidence that they have but to be tried to give them precedence over all others.

J. L. BROWN,
Dr Bank Scales made to order, and all Scales of his make Warranted in every particular.

References given if required.

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Railroad Iron Wanted.

VIRGINIA AND TENNESSEE R.R. OFFICE,
Lynchburg, January 25, 1850.

PROPOSALS will be received at this office, until the 1st of March next, for the delivery in Lynchburg, of iron rails for the Virginia and Tennessee Railroad, to be manufactured in or near this town, of Virginia Iron.

The said iron to be made of the best pig metal, and to be delivered at the following times and in the following quantities, viz: six thousand tons in the year 1851, and the remainder (about 15,000 tons) for the whole road, equally in the years 1852 and 1853.

Separate proposals will also be received for the delivery in Lynchburg, of pig metal, at times and in quantities sufficient for the manufacture of the rails above mentioned, said delivery to commence as early as the 1st of November, 1850.

The rails and pig metal will be subjected to strict inspection—the rails are to weigh about 60 lbs per yard.

At the same time proposals will be received for the above quantity of iron, manufactured any where else in America, or in England, to be delivered in Lynchburg or Richmond, under the same general conditions as those prescribed for Virginia Iron, manufactured at Lynchburg. Satisfactory security will be required.

By order of the Board of Directors.

CHAS. F. M. GARNETT,
Chief Engineer.

FARMERS! ATTENTION!!

John Mayher & Co's

NEW AGRICULTURAL WAREHOUSE
AND SEED STORE.

179 WATER STREET, NEW YORK.

Where they have for Sale, the largest and most complete assortment of Farming Implements, ever offered for sale in this city—all of which they will sell 10 per cent. Cheaper than the same kind of Goods can be bought at any other house in the city. Our Goods are all Warranted to give satisfaction.

FARMERS wanting to purchase, will please call and examine our Stock before buying elsewhere.

Among our assortment may be found the Celebrated Highest Premium Eagle Ploughs! together with all the most approved Ploughs now in use.

Also,—Horse Powers, Threshing Machines, Fan Mills, Corn Shellers, Straw Cutters, Corn Mills, Seed Sowers, Churns, Ox Yokes, Ox Scrapers, Hay Rakes, Horse Rakes, Patent Chain Pump (that never freezes nor rusts), and other Pumps; in fact we have everything for Farming Purposes—together with Guano, Bone Dust and other Fertilizers.

JOHN MAYHER & CO.,
197 Water st., N. Y.

February 9, 1850.

N. B.—J. M. & Co. also continue their Old Stand, at 195 Front street, near Fulton Market.

NOTICE TO**Superintendents of Railroads.**

TYLER'S PATENT SAFETY SWITCH.—The undersigned would respectfully call their attention to his Patent Safety Switch, which from long trial and late severe tests has proved itself perfectly reliable for the purpose for which it was intended. It is designed to prevent the train from running off when the switch is set to the wrong track by design or accident. The single rail or gate switch is established as the best and safest switch for the ordinary purpose of shifting cars from one track to another, but it is liable to the serious evil of having one track open or broken when connected with the other. My improvement entirely removes this evil, and while it accomplishes this important office, leaves the switch in its original simplicity and perfection of a plain unbroken rail, connecting one track with the other ready for use.

The following decision of the Commissioner of Patents is respectfully submitted to Railroad Engineers, Superintendents, and all others interested in the subject.

(COPY.)

UNITED STATES PATENT OFFICE, }

Washington City, D.C., April 28th, 1846.

Sir: You are hereby informed that in the case of the interference between your claims and those of Gustavus A. Nicolls, for improvements in safety switches—upon which a hearing was appointed to take place on the 3d Monday in March, 1846, the question of priority of invention has been decided in your favor. Inclosed is a copy of the decision. The testimony in the case is now open to the inspection of those concerned.

Yours respectfully, EDMUND BURKE,
Commissioner of Patents.

To Philos B. Tyler.

Any further information may be obtained by addressing P. B. TYLER, Springfield, Mass., or JOHN PENDLETON, Agent, 149 Hudson St., New York.

Hydraulic Cement.

HYDRAULIC CEMENT, OF BEST QUALITY, manufactured at their works, for sale in lots to suit purchasers.

Also, Ground Lime, a superior article for Builders.
ISAAC FRYER, Sec'y.
January 19, 1850.

BALL & CO'S PATENT Indestructible Water Pipe.

We publish below the opinions of others who have a personal knowledge of our Pipe, and would request all persons interested in the conveyance of water to investigate its merits for themselves. It being cheaper than Cast iron pipes, and incomparably more durable (as there is no chance to commence decay but continually grows more permanent) it must supersede it altogether in works requiring durability and purity.—Branching, taping, altering or relaying, is done with the greatest facility, and certainty, without injury, in any size of bore from 3 feet diameter down to 4ths of an inch under any head that can be controlled with hose or service pipes. J. BALL & CO.
Corner of Read and Centre Sts., N. Y.

FOR the benefit of those who have requested information in regard to this excellent article, we insert the following testimonials in relation to its merits: "In answer to the numerous inquiries in relation to J. Ball & Co's Indestructible Water pipe, composed of iron and cement and in use in our village, the undersigned, water commissioners, trustees, and late trustees of the village of Saratoga Springs, take this method of saying that we have perfect confidence in the utility, goodness and durability of said pipe. The village of Saratoga Springs has some 20,000 feet of this pipe, varying from 6 1/2 to 14 in. in diameter, under a head of about 80 feet. It has been laid since the fall of 1846. Since it was fully completed, it has cost comparatively nothing to keep it in repair; and, although some portions are exposed to the frost, it seems to stand well the test, and answer all the purposes for which it was designed and constructed. We believe it preferable to iron pipe—is much cheaper and more durable, and we would not exchange it for any other kind of pipe yet invented, if we could without any additional expense or inconvenience. The water comes through clear and pure, and where we have had occasion to take any part of it up to improve or alter the grounds, it appeared to be just as sound and imperishable as the moment it was laid down. This testimony is entirely disinterested, and is now given to avoid the necessity of answering the many calls upon us for information on this subject. We have witnessed and many of us have superintended the laying down of the pipe in this village, and watched its operations since, and are perfectly satisfied that we have the best water pipe ever presented to the public. Saratoga Springs, Dec., '49.

G. M. Davidson,	} Water Com.
R. Putnam,	
N. B. Doe,	
R. Gardner,	} Trustees.
H. P. Hyde,	
J. L. Perry,	
J. D. Briggs,	} Late Trustees.
S. Chapman,	
J. A. Corey,	
W. S. Alger,	
Wm. Cook,	

"I certify that I was Chief Engineer, having the construction of the above work in charge, and fully concur in the foregoing statement. Dec., 1849.

"S. R. OSTRANDER, Civil Engineer."

A card, signed by the Trustees or Water Commissioners of Saratoga Spa (village), expressing their unqualified approval of J. Ball & Co's Indestructible water pipe, has been shown me; whilst I fully endorse from my own experience, the statements of these gentlemen,

I am enabled to add that under my direction, some six thousand feet of cement pipe was laid by Messrs. Ball & Co., in this village, that the main pipe was of 10, 4 and 6 inches bore, and is subjected to a pressure due to an average head of sixty-five feet—it has fully answered my expectations. I would further state that, having been employed by the Common Council of Albany to report a plan of supplying that city with water, I had occasion very carefully to test the merits of this kind of pipe, and was so fully convinced of the practicability of using the cement pipe for large conduits, being of three feet in diameter, as well as for smaller ones, that I recommended its adoption in the proposed work, and give my reasons for so doing.

1st. That the cement pipes are far less expensive than that of cast iron or brick.

2d. That it will sustain an equal pressure with that of cast iron; and when used for large conduits, can be carried up and down the inequalities of the surface of the ground, saving the grading, which is indispensable if a brick one is used.

3d. That it can be readily and economically repaired, and, should it become necessary, can be taken up and relaid without injuring the pipe.

4th. That this description of pipe is not so much affected by frost as one of metal, and in no way impairs the quality of the water. F. S. CLAXTON,
Engineer and Ag't Cohoes Co.

Messrs. J. Ball & Co., New York.
Cohoes, December 31, 1849.

In addition to the above testimonials, we can state that, having had experience and personal knowledge in regard to the excellent qualities and durability of the above pipe, we have no hesitation in recommending it to the public.

Starr & Alburts, 122 Nassau st.

Frederick Marquand, per H. G. M., Atty.

Janes, Beebe & Co.

H. W. Metcalf, 63 and 65 Centre st.

Norman White, 111 Fulton st.

John J. Merritt, No. 76 Columbia st. Brooklyn.

Platt & Brother, 20 Maiden Lane.

Geo. Griswold, South st.

J. & J. W. Meeks, 14, 16 and 18 Vesey st.

Wm. Gale, 116 Fulton st.

J. C. Brown, Builder, 10 Dutch st.

Wm. Colgate & Co.

Thos. C. Smith.

O. R. Burnham, 17 and 19 Broadway.

G. B. Hartson, 58 and 60 Vesey st.

Wm. W. Campbell, 77 St. Mark's Place.

Lorin Brooks, 240 Broadway.

Messrs. J. Ball & Co.:

Gents.: Articles have appeared in the Farmer and Mechanic, from Saratoga and Cohoes, on the subject of your water pipes; I fully endorse their opinions. Your work for my son's water cure at South Orange, embracing a large amount of four and three inch pipe, under a head at least as great as the Croton of New York, shows not only certainty and efficiency, but what is equally important, perfect purity, which for medical purposes is all important, and should be considered so for drinking and other uses.

Yours, SAML. MEEKER.

Newark, January 11, 1850.

In addition to the above, we certify that J. Ball & Co. have inserted pipes for us of 10 inch bore and less, since the winter of 1844, and that last Spring we had over 1000 lbs. of lead pipe removed, and its place supplied with their pipe. We fully endorse the opinions expressed in the notices above.

BEACH, BROTHERS,

New York Sun Establishment.

Having for the past three years laid many of Messrs J. Ball & Co's patent cement pipes in the Newark Aqueduct Co., I prefer them to any pipe that I have used, their cost being one-third less than iron pipe, and also being free from wear and rust, and can most cordially recommend them for all aqueduct purposes.

SHELDON SMITH, Superintendent.

Newark, January 14, 1850.

THE NEWCASTLE MANUFACTURING Co. continue to furnish at the Works, situated in the town of Newcastle, Del., Locomotive and other steam engines, Jack Screws, Wrought Iron Work and Brass and Iron Castings, of all kinds connected with Steamboats, Railroads, etc.; Mill Gearing of every description; Cast Wheels (chilled) of any pattern and size, with Axles fitted, also with wrought tires, Springs, Boxes and bolts for Cars; Driving and other wheels for Locomotives.

The works being on an extensive scale, all orders will be executed with promptness and despatch. Communications addressed to Mr. William H. Dobbs, Superintendent, will meet with immediate attention.

ANDREW C. GRAY,
President of the Newcastle Manuf. Co.

Great American Mechanical Work.

PUBLISHING MONTHLY BY SUBSCRIPTION SPECIMENS OF THE

STONE, IRON, AND WOOD BRIDGES, VIADUCTS, TUNNELS, CULVERTS, &c., of the United States Railroads, illustrated by a Series of Drawings, from actual measurement of the works, including Plans, Elevations, Sections and details of each Structure, accompanied by remarks on the relative merits of the various forms of construction adopted, as regards economy, strength and durability, with Specifications, Estimates, Bills of Timber, Iron, etc., of the several structures; and an APPENDIX, illustrative of the art of Bridge Building as at present practised in Europe; and numerous original Designs for Bridges, Viaducts, Culverts, etc.; the whole calculated to meet the exigencies of Engineers, and assist Draftsmen, Bridge Builders, Mechanics and Students.

BY GEORGE DUGGAN,
ARCHITECT AND CIVIL ENGINEER.

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MODE OF PUBLICATION, TERMS, ETC.

The First or AMERICAN DIVISION of this important work will be completed in about Twelve Parts, and the APPENDIX in about Eight Parts, each part containing Two double or Four single large folio plates, accompanied by appropriate letter press descriptions, Specifications, Estimates of the cost, Bills of Timber, Iron, &c. of each structure, presenting at a glance the comparative merits, as regards economy, strength, and durability of the various modes of Bridge construction at present practised by the most eminent Engineers in the United States.

The Engraving has been entrusted to first rate artists, and is executing in a manner that cannot fail to give satisfaction, while the price (Seventy-five cents a Month) is such as will place it within the reach of all who take an interest in our great mechanical contrivances.

It shall be optional with Subscribers to take the First Division of the work only, but the APPENDIX cannot be supplied to those who do not subscribe for the First Division.

N. B.—Members of the profession, and others wishing to become subscribers, are requested to send their names without delay to the author, as below, as the publication of the names of Subscribers in one of the early Parts has been determined on, and no more copies of the work will be printed than are found necessary to supply Subscribers. Parties remitting \$3, the cost of First or AMERICAN DIVISION of the work, shall receive it monthly as published, POST FREE, in any part of the United States. To those remitting \$5, and the remainder in six months, it will be sent regularly as published, POSTAGE UNPAID.

Engineers in charge of Railroad Works, are respectfully requested to send Tracings of their Drawings of Bridges, &c., with the Specifications, Bills of Timber, Iron, &c., to GEORGE DUGGAN at his residence No. 179 Henry Street, New York, with a view to their insertion in this work.

Great American Mechanical Work.

D. APPLETON & CO. PUBLISH This Week, No. 2, with numerous illustrations, price 25 cts. A DICTIONARY OF MACHINES, MECHANICS, ENGINE WORK AND ENGINEERING; designed for practical working men, and those intended for the engineering profession. Edited by Oliver Byrne. To be completed in about 40 Nos. Price 25 cents each.

This will be the most practical, as well as the most perfect work ever published on Machines, Mechanics, Engine work and Engineering. The Mechanic, Engineer or Machinist, from the time he commences his profession till he arrives at the zenith of the most successful professional career, will find this an indispensable work of reference.

This volume will be of royal 8vo. size, containing nearly 2,000 pages, 1500 plates, and 6,000 cuts; it will fill up a chasm that has long been a requirement to practical working men, and those intended for the engineering profession. It will present Working Drawings and descriptions of every important machine in practical use in the United States, and independent of its American value as embracing the results of American ingenuity, it will contain a complete treatise on Mechanics, Machinery, Engine work, and the substance of at least a thousand dollars worth of books scattered in expensive folio volumes or magazines.

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NOTICE.

TO BRIDGE BUILDERS, BRIDGE COMPANIES, and Other Individuals and Associations, who have constructed or used Bridges involving the combined principle of Bracing, Counter-bracing and Trussing by means of counteracting braces, keys, wedges, screws, etc., as set forth and explained in my Bridge Patent of 1830, in the words following, to wit: "A system of Counter-bracing, by means of which the truss frames are rendered stiff and unyielding, and the bridge kept in uniform action whether loaded or unloaded"—NOTICE is hereby given, that in all cases in which said combined principle has been introduced into bridges, without due license or authority from me, and without my having been duly remunerated therefor, will be regarded as infringements upon my rights and privileges, and that an amicable adjustment and settlement of all my claims in the premises may be effected by prompt application to my duly authorized Agents therefor, viz: Messrs. Clinton, Knight and Brother, of Cincinnati, Ohio, or Daniel A. Webster, Esq., 8 Pell street of the city of New York.

STEPHEN H. LONG, Patentee.

Louisville, December 10, 1849

3,000 Tons Railroad Iron.

THE UNDERSIGNED IS PREPARED TO contract for the delivery of the above quantity at any port of the United States. Can be made of any required pattern and of a favorite brand.

CHARLES ILLIUS,
20 Beaver St., New York.

1m3

The New York Iron Bridge Co.

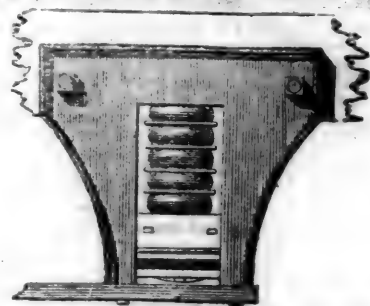
LATELY KNOWN AS

Rider's Patent Iron Bridge Co.

THE Company which has hitherto furnished these Bridges, under the patent granted to the late Nathaniel Rider, deceased, have become satisfied that all the principles embraced in their construction, are included in a previous patent, granted in the year 1839, to Col. Stephen H. Long, of U. S. Engineers, and by him designated as "Long's Suspension Bridges," and have therefore made an arrangement with Col. Long, by which they have secured the exclusive right to make and vend these Bridges throughout the whole United States.

The only change consequent upon the new arrangement will be found in the name and style of the Company. The parties composing it being the same, the construction of the Bridges will be essentially the same. August 4th, 1849. M. M. White, Agent, au7td No. 74 Broadway, New York.

FULLER'S PATENT INDIA RUBBER SPRING.



THESE SPRINGS ARE THE CHEAPEST, the lightest and most durable of any yet known. They are easily applied to new or old cars, and there is small possibility of any accident occurring to them. Other parties through Mr. Ray set up claims to an India Rubber Spring which, though the same in principle, is very inferior in its working and durability. Actions are in progress for an Infringement on Fuller's Patent against parties using that Spring.

The superiority of Fuller's Spring over that claimed by Mr. Ray is fully established and has frequently been testified to. The following are from gentlemen who have had much experience with both Springs.

"It will afford me pleasure to recommend your springs to the companies in this region, in preference to Ray's which I am confident are inferior in mechanical arrangement to yours." JOHN M'RAE, Engineer S. Carolina R. R., Charleston.

"I do not hesitate to allow you to say that I concur in Mr. M' Rae's opinion that Ray's springs are inferior in mechanical arrangement to Fuller's. I repeatedly expressed that opinion long before Mr. M' Rae had seen your springs (as I believe) and entertain it still." WM. PARKER, Gen'l Supt. of Baltimore and Ohio R. R.

Office of Supt. Norwich & Worcester R.R. Co.,
December 26, 1849.

"I most fully concur in the opinion of Jno. M' Rae, Engineer of S. Carolina Railroad, that 'Rays Springs are inferior to Fuller's Springs;' and shall with pleasure recommend them to all Railroad Companies for adoption. I have used both springs on this road and have no hesitation in saying that I should in all cases prefer Fuller's Spring."

SAM'L H. P. LEE, JR.,
Supt. and Engineer.

Office B. & P. R. R. Co.,
Boston, 20th December, 1849.

"This company have cars fitted up with both Ray's and Fuller's 'Metallic India Rubber Springs;' and I do not hesitate to say that Fuller's arrangement is very much superior to Ray's."

W. RAYMOND LEE, Supt.

The following result has been obtained by experiment upon one railroad.

A set of Trucks fitted with Steel Springs cost \$190.77 and weigh 2355 lbs. The same with Fuller's Springs, 131.71 " 1911 lbs.

Difference, \$59.06 " 444 lbs.

Not only is there an advantage in the cost, but owing to the great reduction in weight, the car can be made lighter throughout, and so an enormous saving in weight may be effected in a Train.

G. M. KNEVITT, 38 Broadway, N. Y.,
General Agent for the U. S.

The Springs can also be had of JAMES LEE & CO., 18 India Wharf, Boston, & JAS. THORNLEY, 110 Chestnut St., Philad. January 2, 1850.

Railroad Iron.

2,000 Tons Heavy Rails, 57 and 61 lbs. per lineal yard, in store, and to arrive, within 30 days.

500 Tons 2½ x ½ inch flat Rails.

1000 Tons 56 lbs. per lineal yard.

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February 2, 1850.

LIST NO. 1, [To be Continued.]

Engineering, Railways, Machinery, Steam Engines, etc.

JOHN WILEY, 161 BROADWAY NEW YORK, has on hand and for sale the following Works on the above subjects:

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Buckland, George,
Troy and Greenbush Railroad.

Clement, Wm. H.,
Little Miami Railroad, Cincinnati, Ohio.

Cozzens, W. H.,
Engineer and Surveyor, St. Louis, Mo.

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Eckhart Mines, Alleghany Co., Maryland.

Fisk, Charles B.,
Cumberland and Ohio Canal, Washington, D. C.

Felton, S. M.,
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Floyd-Jones, Charles,
South Oyster Bay, L. I.

Gzowski, Mr.,
St. Lawrence & Atlantic Railroad, Montreal, Canada.

Gilbert, Wm. B.,
Rutland and Burlington Railroad, Rutland, Vt.

Grant, James H.,
Nashville and Chattanooga R. R., Nashville, Tenn.

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Southwestern Railroad, Macon, Ga.

Higgins, B.,
Mansfield and Sandusky Railroad, Sandusky City, O.

Johnson, Edwin F.,
New York and Boston Railroad, Middletown Ct.

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Baltimore and Ohio Railroad, Baltimore, Md.

Miller, J. F.,
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Morris, Elwood,
Schuylkill Navigation, Schuylkill Haven, Pa.

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South Carolina Railroad, Charleston, S. C.

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Prichard, M. B.,
East Tennessee and Georgia R. R., Cleveland, Tenn.

Reynolds, L. O.,
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Trenton, N. J.

Roberts, Solomon W.,
Ohio and Pennsylvania Railroad, Pittsburgh, Pa.

Robinson, James P.,
Androscoggin & Kennebec Railroad, Waterville, Me.

Sanford, C. O.,
South Side Railroad, Virginia.

Schlatter, Charles L.,
Northern Railroad (Ogdensburg), Malone, N. Y.

Sours, Peter,
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Stark, George.,
Bost., Con. and Mont. R. R., Meredith Bridge, N. H.

Steele, J. Dutton,
Pottstown, Pa.

Trimble, Isaac R.,
Philad., Wil. & Baltimore Railroad, Wilmington, Del.

Tinkham, A. W.,
United States Fort, Bucksport, Me.

Thomson, J. Edgar.,
Pennsylvania (Central) Railroad, Philadelphia.

Whipple, S.,
Civil Engineer and Bridge Builder, Utica, N. Y.

Williams, E. P.,
Auburn and Schenectady Railroad, Auburn, N. Y.

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Wormeley, Preble,
Central Ohio Railroad, Zanesville, Ohio.

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BRIDGES & WEST, Proprietors.

DUNLAP'S HOTEL,
On the European Plan,
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Between Broadway and Nassau St.,
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For the Purchase and Sale of Railroad Iron (new and old,) Boiler Plates, Pig and Bar Iron, Lead, Tin, Copper, Spelter, etc. Refers to
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February 9, 1850. 6m*

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Manufacturers of Cast, Shear, German and Blister
STEEL,
Of all Descriptions, Warranted Good.
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Manufacturers of Cast, Shear, German and Blister
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Of all descriptions. Warranted Good
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Manufacturers of Machinists' Warranted Best Cast Steel Files, expressly for working upon Iron and Steel, made very heavy for recutting.
A full Stock of Steel and Files at all times on hand. 6m4

Cumberland, (Md.) Coals for Steaming, etc.

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BROKER IN SCOTCH AND
AMERICAN PIG IRON;
Bar Iron, Lead, Spelter, Tin, Copper, etc.,
No. 4 Liberty Place, MALDEN LANE,
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Manufacture of Patent Wire ROPE AND CABLES,

For Inclined Planes, Suspension Bridges, Standing Riggings, Mines, Cranes, Derrick, Tillers, &c., by
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Agents for Avalon Railroad Iron and Nail Works.
Maryland Mining Company's Cumberland Coal 'CED'
—Potomac' and other good brands of Pig Iron.

**Railroad Car Manufacturer's
Furnishing Store.****F. S. & S. A. MARTINE,**

IMPORTERS AND MANUFACTURERS OF

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112 WILLIAM ST., NEAR JOHN.3-4 and 6-4 Damasks, Union and Worsteds; Mo-
reens, Rattinetts, Cloths, Silk and Cotton Velvets,
English Bunting**Walter R. Johnson,**CIVIL AND MINING ENGINEER AND AT-
torney for Patents. Office and Laboratory, F St.,
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52 and 54 Liberty, corner of Pruyn street

Nathan Starks, **ALBANY** Special Partner
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Iron Railing, Bank and Vault Doors, Iron Shutters
Bridge and Roof Bolts, Heavy Jobbing and Forging
of all kinds.

For particulars see Adv. in another column.

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kers No. 27 Fulton Slip, New York, make and keep
for sale, Theodolites, Levelling inst., Levelling rods,
Surveyors Compasses, and Chains, Cases of Mathe-
matical drawing insts. various qualities, together with
a general assortment of Ivory Scales and small insts.
generally used by Engineers.**Samuel Kimber & Co.,
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AGENTS for the sale of Charcoal and Anthracite
Pig Iron, Hammered Railroad Car and Locomo-
tive Axles, Force Pumps of the most approved con-
struction for Railroad Water Stations and Hydraulic
Rams, etc., etc.
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PATENTEE OF THE

HERRON RAILWAY TRACK.Models of this Track, on the most improved plans,
may be seen at the Engineer's office of the New York
and Erie Railroad.**To Railroad Companies.**—WROUGHT IRON WHEELS—
SAFETY AND ECONOMY.**NORRIS' LOCOMOTIVE WORKS,
SCHENECTADY, NEW YORK,**Are Manufacturing Wrought Iron Driving, Truck,
Tender, and Car Wheels—made from the best Ameri-
can Iron. Address E. S. NORRIS.
May 16, 1849.**Machinery Warehouse.**S. C. HILLS, No. 43 Fulton street, New York, has
constantly for sale Steam Engines, Boilers, Lathes,
Chucks, Drills, Planers, Force and Suction Pumps;
Tenoning, Mortising and Boring Machines, Shingle
Machines, Bolt and Nut Machines, Belting, Oil, Iron
and Lead Pipe; Rubber, Percha and Leather Hose,
&c., &c.S. C. H.'s arrangements with several machine shops
are such that he can supply, at very short notice, large
quantities of machinery.
November 23, 1849.**Cruse & Burke,**Civil Engineers, Architects and Surveyors,
Office, New York State Institution of Civil Engineers,
STATE HALL, ALBANY, N. Y.Drawings, specifications and surveys accurately ex-
ecuted. Pupils instructed theoretically and practical-
ly at a moderate premium.
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To Railroad & Navigation Cos.Ma. M. BUTT HEWSON, Civil Engineer, offers his
services to Companies about to carry out the surveys
or works of a line of Navigation or Railroad. He can
give satisfactory references in New York City as to his
professional qualifications; and will therefore merely
refer here to the fact of his having been engaged for
upwards of two years conducting important Public
Works for the British Government.Communications will find Mr. Hewson at the office
of the Railroad Journal, 54 Wall Street, New York.**Alfred W. Craven,**

Chief Engineer Croton Aqueduct, New York.

Cop Waste.CLEAN COP WASTE, suitable for cleaning Rail-
road, Steam boat and Stationary Engines, con-
stantly on hand and for sale byKENNEDY & GELSTON,
54 Pine St., New York.

October 27, 1849,

IRON.**Iron.**Pig Iron, Anthracite and Charcoal; Boiler and Flue
Iron, Spring and Blistered Steel, Nail Rods, Best Re-
fined Bar Iron, Railroad Iron, Car Axles, Nails, Stove
Castings, Cast Iron Pipes of all sizes, Railway Chairs
of approved patterns for sale byCOLEMAN, KELTON & CAMPBELL,
109 N. Water St., Philadelphia.**TRONDALE PIG METAL, MANUFACTURED**and for sale by the Bloomsburg Railroad Iron Co.
DUDLEY FISHER, Treasurer.
75 N. Water St., Philadelphia.**Railroad Iron.**500 Tons, affort, weighing 57 pounds per lineal
yard, for sale byCOLLINS, VOSE & CO.,
158 South St.

New York, November 17, 1849.

Railroad Iron.THE Undersigned, Agents for Manufacturers, are
prepared to contract to deliver Rails of superior
quality, and of any size or pattern, to any ports of dis-
charge in the United States.COLLINS, VOSE & CO.,
158 South St.

New York, November 17, 1849.

Railroad Iron.

1600 Tons, weighing 60½ lbs. per yard.

185 " " 57½ "

590 " " 53 "

of the latest and most approved patterns. For sale by

BOORMAN, JOHNSTON & CO.,

119 Greenwich street.

New York, Oct. 13, 1849.

Railroad Iron.THE Undersigned have on hand, ready for immedi-
ate delivery, various patterns of Iron Rails, of
best English make, and manufactured in conformity
with special specifications.They offer also to import and contract to deliver
ahead—on favorable terms.DAVIS, BROOKS, & CO.,
68 Broad street.

New York, Oct. 11, 1849.

Drawings and Patterns of the most approved
Rail—and specifications of quality and make of same,
are on hand at their office, for examination of parties
who may desire to inspect the same. D., B. & Co.
Oct. 11, 1849.**CUT NAILS OF BEST QUALITY, BAR IRON**(including Flat Rails) manufactured and for sale
by FISHER, MORGAN & CO.,
75 N. Water St., Philadelphia.**Glendon Refined Iron.**Round Iron, Band Iron, Hoop Iron,
Square " Flat " Scrolled "Axles, Locomotive Tyres,
Manufactured at the Glendon Mills, East Boston, for
sale by GEORGE GARDNER & CO.,
5 Liberty Square, Boston, Mass.

Sept. 15, 1849.

3m37

**PATENT HAMMERED RAILROAD, SHIP &
BOAT SPIKES.**—The Albany Iron Works
have always on hand, of their own manufacture, a
large assortment of Railroad, Ship and Boat Spikes
from 2 to 12 inches in length, and of any form of head.
From the excellence of the material always used in
their manufacture, and their very general use for rail-
roads and other purposes in this country, the manu-
facturers have no hesitation in warranting them fully
equal to the best spikes in market, both as to quality
and appearance. All orders addressed to the subscrib-
ers at the works will be promptly executed.

JOHN F. WINSLOW, Agent.

Albany Iron and Nail Works, Troy, N. Y.
The above Spikes are to be had at first prices, of
Erastus Corning & Co. Albany; Merrill & Co., New
York; E. Pratt & Br. 100, F. & M. Md**LAP—WELDED
WROUGHT IRON TUBES**

FOR

TUBULAR BOILERS,

FROM 1 1-2 TO 3 INCHES DIAMETER.

These are the ONLY Tubes of the same quality
and manufacture as those so extensively used in
England, Scotland, France and Germany, for Lo-
comotive, Marine and other Steam Engine Boilers

THOMAS PROSSER,

Patentee.

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Railroad Iron.THE UNDERSIGNED ARE PREPARED TO
contract for the delivery of English Railroad Iron
of favorite brands, during the Spring. They also re-
ceive orders for the importation of Pig, Bar, Sheet, etc.
IRON.

THOMAS B. SANDS & CO.,

22 South William street,

February 3, 1849.

New York.

Iron Store.THE Subscribers, having the selling agency of the
following named Rolling Mills, viz: Norristown,
Rough and Ready, Kensington, Triadelphia, Pott-
grove and Thorndale, can supply Railroad Companies,
Merchants and others, at the wholesale mill prices for
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diameter; Railroad Iron, domestic and foreign; Loco-
motive tire welded to given size; Chairs and Spikes;
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purposes; Cast, Shear, Blister and Spring Steel; Bol-
ter rivets; Copper; Pig Iron, etc., etc.

MORRIS, JONES & CO.,

Iron Merchants,

Schuylkill 7th and Market Sts., Philadelphia.

August 16, 1849.

1y33

Railroad Iron.THE MOUNT SAVAGE IRON WORKS, AL-
legany county, Maryland, having recently pass-
ed into the hands of new proprietors, are now prepar-
ed, with increased facilities, to execute orders for any
of the various patterns of Railroad Iron. Commu-
nications addressed to either of the subscribers will have
prompt attention. J. F. WINSLOW, President

Troy, N. Y.

ERASTUS CORNING, Albany

WARREN DELANO, Jr., N. Y.

JOHN M. FORBES, Boston.

ENOCH PRATT, Baltimore, Md.

November 6, 1849.

Railroad Iron.THE SUBSCRIBERS ARE PREPARED TO
take orders for Railroad Iron to be made at their
Phoenix Iron Works, situated on the Schuylkill Riv-
er, near this city, and at their Safe Harbor Iron Works,
situated in Lancaster County, on the Susquehanna
river; which two establishments are now turning out
upwards of 1800 tons of finished rails per month.
Companies desirous of contracting will be promptly
supplied with rails of any required pattern, and of the
very best quality.

REEVES, BUCK & CO.,

45 North Water St., Philadelphia

March 15, 1849.

Monument Foundry.

A. & W. DENMEAD & SON,
Corner of North and Monument Sts.,—Baltimore,
HAVING THEIR

IRON FOUNDRY AND MACHINE SHOP

In complete operation, are prepared to execute faithfully and promptly, orders for Locomotive or Stationary Steam Engines, Woolen, Cotton, Flour, Rice, Sugar Grist, or Saw Mills, Slide, Hand or Chuck Lathes, Machinery for cutting all kinds of Gearing, Hydraulic, Tobacco and other Presses, Car and Locomotive patent Ring Wheels, warranted,

Bridge and Mill Castings of every description, Gas and Water Pipes of all sizes, warranted, Railroad Wheels with best fagotted axle, furnished and fitted up for use, complete

Being provided with Heavy Lathes for Boring and Turning Screws, Cylinders, etc., we can furnish them of any pitch, length or pattern.

Old Machinery Renewed or Repaired—and Estimates for Work in any part of the United States furnished at short notice.

June 8, 1849.

Iron Wire.

REFINED IRON WIRE OF ALL KINDS,
Card, Reed, Cotton-fiver, Annealed, Broom, Buckle, and Spring Wire. Also all kinds of Round, Flat or Oval Wire, best adapted to various machine purposes, annealed and tempered, straightened and cut any length, manufactured and sold by

ICHABOD WASHBURN.

Worcester, Mass., May 25, 1849.

American and Foreign Iron.**FOR SALE.**

300 Tons A 1, Iron Dale Foundry Iron.

100	"	1	"	"	"
100	"	2	"	"	"
100	"	"	"	Forge	"
400	"	"	"	Wilkesbarre	"
100	"	"	"	"Roaring Run" Foundry Iron.	"
300	"	"	"	Fort	"
50	"	"	"	Catoctin	"
250	"	"	"	Chikiswalungo	"
50	"	"	"	"Columbia" "chilling" iron, a very superior article for car wheels.	"
75	"	"	"	"Columbia" refined boiler blooms.	"
30	"	"	"	1 x 1/4 Slit iron.	"
50	"	"	"	Best Penna. boiler iron.	"
50	"	"	"	"Puddled"	"
50	"	"	"	Bagnall & Sons refined bar iron.	"
50	"	"	"	Common bar iron.	"

Locomotive and other boiler iron furnished to order.

GOODHUE & CO.,

New York.

64 South street

American Pig, Bloom and Boiler Iron.

HENRY THOMPSON & SON,
No 57 South Gay St., Baltimore, Md.,
Offer for sale, Hot Blast Charcoal Pig Iron made at the Catoctin (Maryland), and Taylor (Virginia), Furnaces; Cold Blast Charcoal Pig Iron from the Cloverdale and Calamba, Va., Furnaces, suitable for Wheels or Machinery requiring extra strength; also Boiler and Flue Iron from the mills of Edge & Hilles in Delaware, and best quality Boiler Blooms made from Cold Blast Pig Iron at the Shenandoah Works, Va. The productions of the above establishments can always be had at the lowest market prices for approved paper.

American Pig Iron of other brands, and Rolled and Hammered Bar Iron furnished at lowest prices. Agents for Watson's Perth Amboy Fire Bricks, and Rich & Cos. New York Salamander Iron Chests.

Baltimore, June 14, 1849.

6 mos

LAP-WELDED WROUGHT IRON TUBES
for Tubular Boilers, from 1 1/4 to 15 inches diameter, and any length not exceeding 17 feet—manufactured by the Caledonian Tube Company, Glasgow, and for sale by

IRVING VAN WART,
12 Platt street, New York.

JOB CUTLER, Patentee.

These Tubes are extensively used by the British Government, and by the principal Engineers and Steam Marine and Railway Companies in the Kingdom.

Railroad Iron.

THE TRENTON IRON COMPANY ARE NOW turning out one thousand tons of rails per month, at their works at Trenton, N. J. They are prepared to enter into contract to furnish rails of any pattern, and of the very best quality, made exclusively from the famous Andover iron. The position of the works on the Delaware river, the Delaware and Raritan canal, and the Camden and Amboy railroad, enables them to ship rails at all seasons of the year. Apply to

COOPER & HEWITT, Agents.

October 30, 1848. 17 Burling Slip, New York.

Pig and Bloom Iron.

THE SUBSCRIBERS are Agents for the sale of numerous brands of Charcoal and Anthracite Pig Iron, suitable for Machinery, Railroad Wheels, Chains, Hollowware, etc. Also several brands of the best Puddling Iron, Juniata Blooms suitable for Wire, Boiler Plate, Axe Iron, Shovels, etc. The attention of those engaged in the manufacture of Iron is solicited by

A. WRIGHT & NEPHEW,
Vine Street Wharf, Philadelphia.

Iron.

THE SUBSCRIBERS having resumed the agency of the New-Jersey Iron Company, are prepared to execute orders for the different kinds and sizes of iron usually made at the works of the company, and offer for sale on advantageous terms.—

150 tons No. 1 Boonton Foundry Pig Iron.

100	"	No. 2	do.	do.	do.
300	"	Nos. 2 & 3 Forge	do.	do.	do.
100	"	No. 2 Glendon	do.	do.	do.
140	"	Nos. 2 & 3 Lehigh Crane	do.	do.	do.
100	"	No. 1 Pompton Charcoal	do.	do.	do.
100	"	New-Jersey Blooms	do.	do.	do.
50	"	New-Jersey Fagotted Iron, for shafts	do.	do.	do.
		Best Bars, 1/2 to 4 inch by 1/2 to 1 inch thick.	do.	do.	do.
		Do do Rounds and Squares, 1/2 to 3 inch.	do.	do.	do.
		Rounds and Squares, 3-16 to 1 inch.	do.	do.	do.
		Half Rounds, 1/2 to 1 in. Ovals & Half Ovals 1/2 to 1 1/4 in.	do.	do.	do.
		Bands, 1 1/4 to 4 inch. Hoops, 1/2 to 2 inch.	do.	do.	do.
		Trunk Hoops, 1/2 to 1 1/4 in. Horse Shoe & Nut Iron.	do.	do.	do.
		Nail Plates. Railroad Spikes.	do.	do.	do.

DUDLEY B. FULLER & Co., 139 Greenwich-st. and 85 Broad-st.

WILLIAM JESSOP & SONS' CELEBRATED CAST-STEEL.

The subscribers have on hand, and are constantly receiving from their manufactory

PARK WORKS, SHEFFIELD,

Double Refined Cast Steel—square, flat and octagon. Best warranted Cast Steel—square, flat and octagon. Best double and single Shear Steel—warranted. Machinery Steel—round. Best and 2d gy. Sheet Steel—for saws and other purposes.

German Steel—flat and square, "W. I. & S." "Eagle" and "Goat" stamps.

Genuine "Sykes," L Blister Steel.

Best English Blister Steel, etc., etc., etc.

All of which are offered for sale on the most favorable terms by

WM. JESSOP & SONS,

91 John street, New York.

Also by their Agents—

Curtis & Hand, 47 Commerce street, Philadelphia.

Alex'r Fullerton & Co., 119 Milk street, Boston.

Stickney & Beatty, South Charles street, Baltimore.

May 6, 1848.

SPRING STEEL FOR LOCOMOTIVES, TENDERS AND CARS.—The subscriber is engaged in manufacturing spring steel from 1 1/4 to 6 inches in width, and of any thickness required: large quantities are yearly furnished for railroad purposes, and wherever used its quality has been approved of. The establishment being large, can execute orders with great promptitude, at reasonable prices, and the quality warranted. Address **J. F. WINSLOW, Agent,** Albany Iron and Nail Works.

JOHNSON, CAMMELL & Co's Celebrated Cast Steel,

AND ENGINEERING AND MACHINE FILES, which for quality and adaptation to mechanical uses, have been proved superior to any in the United States. Every description of square, octagon, flat and round cast steel, sheet, shovel and railway spring steel, best double and single shear steel, German steel, flat and square, goat stamps, etc. Saw and file steel, and steel to order for any purposes, manufactured at their Cyclops Steel Works Sheffield.

JOHNSON, CAMMELL & CO.,

100 William St., New York.

November 23 1849.

American Cast Steel.

THE ADIRONDAC STEEL MANUFACTURING CO. is now producing, from American iron, at their works at Jersey City, N.J., Cast Steel of extraordinary quality, and is prepared to supply orders for the same at prices below that of the imported article of like quality. Consumers will find it to their interest to give this a trial. Orders for all sizes of hammered cast steel, directed as above, will meet with prompt attention.

May 28, 1849.

To Steam Engine Builders.

The undersigned offer for sale, at less than half its cost, the following new machinery, calculated for an engine of 62 inches cylinder and 10 feet stroke, viz:

- 2 Wrought Iron Cranks, 60 inches from centre to centre.
- 1 Do. do. Connecting Rod Strap.
- 2 Do. do. Crank Pins.
- 1 Eccentric Strap.
- 1 Diagonal Link with Brasses.
- 1 Cast Iron Lever Beam (forked).

The above machinery was made at the West Point Foundry for the U. S. Steamer Missouri, without regard to expense, is all finished complete for putting together, and has never been used. Drawings of the cranks can be seen on application to

HENRY THOMPSON & SON,

No. 57 South Gay St., Baltimore, Md.

Sept. 12, 1849.

Railroad Instruments.

THEODOLITES, TRANSIT COMPASSES, and Levels, with Fraunhoffer's Munich Glasses, Surveyor's Compasses, Chains, Drawing Instruments, Barometers, etc., all of the best quality and workmanship, for sale at unusually low prices, by

E. & G. W. BLUNT,

No. 179 Water St., cor. Burling Slip.

New York, May 19, 1849.

Ballard's Improved JACK-SCREW.

PATENTED.

THE ADVANTAGES OF THIS Screw for Stone Quarries, Railroads, Steam Boiler Builders, and for other purposes are superior to any other similar machine.

The improvement consists in being able to use either end of the screw, as occasion requires.

It is capable of raising the heaviest Locomotive with ease, being portable, strong and powerful, and not likely to get out of order.

Many Railroad Companies and Boiler Makers have them in use—by whom they are highly recommended.

JACK SCREWS,

of various sizes, power and price, constantly on hand at the manufactory.

No. 7 Eldridge Street,

near Division Street.

New York, Jan. 19, 1850.

**To Railroad Companies and Contractors.**

FOR SALE.—Two Locomotive Engines and Tenders, at present in use on the Beaver Meadow Railroad, being too light for their coal trains, but well calculated for either gravel or light passenger trains.

They weigh, in running order, about 8 tons each—having one pair of driving wheels 4 feet diameter, 4 truck wheels 30 inches diameter, with cylinders 10 in. diameter, and 18 inches stroke of piston. Tenders on 4 wheels. Address **JAMES ROWLAND,**

Pres't. Beaver Meadow Railroad & Coal Co.,

Philadelphia.

or, **L. CHAMBERLAIN, Sec'y,**

at Beaver Meadow, Pa.

May 19, 1849.

To Inventors and Patentees.

OWEN G. WARREN, ARCHITECT, Has had many years' experience as Agent for obtaining Patents, both in this country and Europe, and will transact such business promptly and reasonably. Persons at a distance can have their business done by correspondence—without the necessity of visiting this city or Washington. Office No. 34 Merchants Exchange, Wall st., corner of Hanover st., up stairs. 1y3

To Railroad Companies.

FOR SALE—A Second-hand Locomotive Engine and Tender, of about 10 tons weight, in good order, and warranted to perform well. Any company wanting a cheap engine for a passenger or light burden train, will rarely meet with an opportunity so favorable as the present. The engine and tender are in perfect running order, and will be tested to the satisfaction of any one wishing to purchase. Price \$1,500.

Address **J. B. MOORHEAD,**
Frazer P.O., Chester county, Pa.

P.S.—The Engine can be seen by calling on H. Osmond & Co., Car-builders, Broad st., Philadelphia.
September 6, 1849.

India-rubber for Railroad Cos.

RUBBER SPRINGS—Bearing and Buffer—Fuller's Patent—Hose from 1 to 12 inches diameter. Suction Hose. Steam Packing—from 1-16 to 2 in. thick. Rubber and Gutta Percha Bands. These articles are all warranted to give satisfaction, made under Tyer & Helm's patent, issued January, 1849.—No lead used in the composition. Will stand much higher heat than that called "Goodyear's," and is in all respects better than any in use. Proprietors of railroads do not be overcharged by pretenders.

HORACE H. DAY,

Warehouse 23 Courtlandt street.

New York, May 21, 1849.

Fire Brick.

THE Subscribers have constantly on hand Rafford's Stourbridge, Oak Farms Stourbridge, Lister, Wortley, Red and White Welsh Fire Bricks, common and fancy shapes. Also,

ROOFING SLATES,

from the best Welch quarries, and of all sizes. Also,

COAL,

of all kinds—Liverpool Orrell and Cannel, Scotch, New Castle, Pictou, Sidney, Cumberland, Virginia, and all kinds of Anthracite coals. Also,

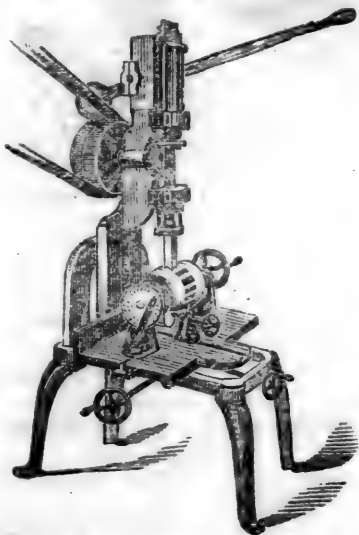
Pig Iron, Salt, etc., etc., for sale at the lowest market price. Apply to

SAMUEL THOMPSON & NEPHEW,

275 Pearl and 43 Gold Sts., New York.

November, 23, 1849.

**Capt. Alfred Swingle's
PATENT BORING
& MORTISING MACHINE.**



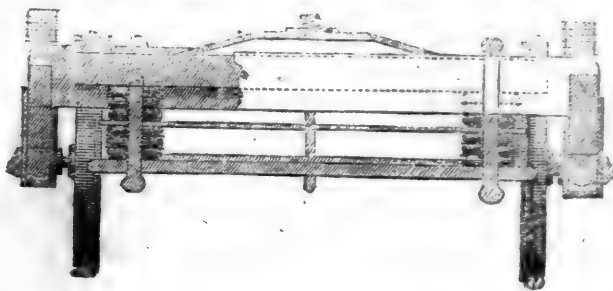
The above Machine was invented by A. SWINGLE, of Texas, in 1846, and Letters Patent were taken out in July, 1848. As a labor saving Machine it stands unrivalled even in these days of improvement. Its uses are innumerable; it may be successfully applied to Doors, Sashes, Carriages, Wheel-Hubs, and in fact to all kinds of work where the Auger and Chisel can be brought to bear.

The only limit to the speed of the working of this machine is the heating of the tools used. It will perform at least the labor of twelve men, and in vastly better manner, and can be worked equally well by steam power or by hand. It has been used and has given universal satisfaction.

For further information apply to H. B. TOWNSEND, 40 Wall St., New York, to whom all orders are to be addressed.

New York, December 15, 1849.

**FULLER'S PATENT
INDIA RUBBER CAR SPRINGS.**



RAILROAD COMPANIES are cautioned, before purchasing Springs, to examine the actual patents and judge for themselves.

Persons, under the Title of the New England Car Company, seeking fraudulently to invade Fuller's rights, have put forth so many statements for the purpose of misleading the public, that an enumeration of some facts is absolutely necessary, for the purpose of putting persons interested upon their guard.

Fuller's patent is for the application of Discs of India-rubber with Metal Plates, for forming Springs for Railway Cars and Carriages—either one disc and two plates, or ten discs and plates, or any other number, are covered by the patent. Fuller is not bound to the use of short discs—he may use long discs and plates.

Ray's patent is simply and wholly the forming of air tight rubber cylinders, with hoops or bands round the outside, and the combination of elasticity of India rubber, with the elasticity of atmospheric air confined in the cylinder, and in no part of his patent is he authorized to use the form of spring which he is now fraudulently supplying to Railroad Companies. Such springs are direct and positive infringements of the very letter of Fuller's patent.

Fuller's patent is dated October, 1845, Ray's patent, August, 1848.

The spring patented by Ray never has been put in operation, and never can be made useful for Railroad cars.

A mere experiment, even if made, it is well known does not prove an invention; and it is ridiculous for such parties to hope to mislead the Presidents and Superintendents of Railroad companies, by claiming the invention because Ray alleges he made an experiment—which Fuller had made before him—had actually brought into working order, and obtained a patent for—and this too before Mr. Ray states he made his experiment—and that experiment not claimed to have been applied to a car or carriage.

Besides, the invention could not have been developed until India rubber, properly Vulcanised, could be made of a sufficient thickness. In the United States the art of vulcanising rubber by steam heat, (by which

means only can a body of rubber having any considerable thickness be vulcanised,) was not introduced until after the grant by the American government of the patent for springs to Fuller—whereas the process of vulcanising rubber by steam heat was invented in England about three years previously, and was used by Fuller there. This fact refutes entirely the claim of invention put forth by Mr. Ray, and proves the impossibility of his pretensions being true.

Fuller was the first and only inventor of the spring. A Mr. Dorr, whose connection with Mr. Goodyear is well known in this country, applied in England to Mr. Fuller, after he had published and patented his invention, and introduced another party for the purpose of obtaining the agency for the United States. They were furnished with a complete set of drawings and models, and with instructions to make arrangements for the supply of material of American manufacture—from that hour to the present not a single communication has been received from them. Some of these identical models have been traced into the hands of parties now seeking to invade Fuller's rights, and who have exhibited them as specimens of their own invention.

After this, the conveyance was made by Goodyear to certain parties here for the use for railroad springs of what he calls his Metallic rubber. Comment is unnecessary.

There are 5 or 6 different processes for the manufacture of vulcanised rubber, patented by as many different parties, some here, some in England, either of which would probably make good springs.

A large and powerful company has been organized under Fuller's patent, the particulars of which shall be given very shortly.

An action has been commenced against three railroad companies for infringement; and all other parties will assuredly be prosecuted if they continue farther to infringe upon Fuller's patent.

W. C. FULLER,

The only persons authorised to supply the Springs are **G. M. KNEVITT**, 38 Broadway, N. York,

General Agent for the U. S.; and

JAS. LEE & Co., 18 India Wharf, Boston.

JOHN THORNLEY, Chestnut st., Philad.

**Arch St. Machine Shop.
BIRKENBINE, MARTIN & TROTTER,
Makers of
STEAM ENGINES,**

and
**HYDRAULIC MACHINERY,
NO. 16 ARCH STREET,
PHILADELPHIA,**

Will construct Steam Engines, Pumps, for Draining Mines and Land; supplying Water to Towns, Factories, Farms, etc;

Also, Street Stops, Fire Plugs, Water Tanks, and Hydraulic Rams, with

(BIRKENBINE'S PATENT VALVES.)

B., M. & T. contract for Warming and Ventilating Buildings by Steam or Warm Water.

J. E. Mitchell,

NO. 14 OLD YORK ROAD, PHILADELPHIA.
Importer and manufacturer of

New Castle
Nova Scotia
Wickerly
French Burr
Cochahe
Cologne
American and
Patent compressed
Garnkirk
Grindstones, of all sizes and grits.
Millstones, made to order, with all the recent improvements.

Fire Bricks and Tiles of various sizes.
Burr Blocks, Bolting Cloths, Mill Irons, etc.

**To the Proprietors of Rolling
Mills and Iron Works.**

THE Undersigned—Proprietors of Townsend's Furnace and Machine Shop, Albany—are extensively engaged in the manufacture of Machinery and fixtures for Iron, and Copper Rolling Mills, and Iron Works. Having paid particular attention to the manufacture of *Rolls* (Rollers), both *chilled* and *dry-sand*, they feel confident that they can execute orders for such castings in a satisfactory manner. And to give assurance of this, they beg leave to refer to the following named persons, proprietors and managers of some of the most extensive rolling mills in the country, viz: Jno. F. Winslow, J. Tuckerman, H. Burden, W. Burt, J. & J. Rogers, Saitus & Co., J. B. Bailey, L. G. B. Cannon, Hawkins & Atwater, etc., etc.

F. & T. TOWNSEND.

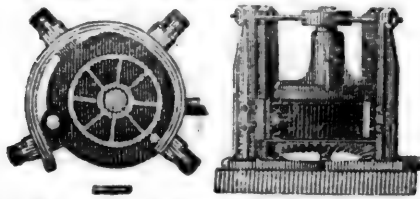
Albany, August 19, 1849.

Steam Boiler Explosions.

THE Subscriber having been appointed sole Agent for Faber's Magnetic Water Gauge, is now ready to supply the trade, and also individuals with this celebrated instrument. Besides the greatest safety from explosion resulting from its use, it is a thorough check against careless stoking and feeding. In marine engines it will regulate the exact quantity required in the "blow off." Pamphlets containing full information, can be had free on application to the Agent

JOSEPH P. PRUSSON,

Civil Engineer, 5 Wall st.

MACHINERY.**Henry Burden's Patent Revolving Shingling Machine.**

THE Subscriber having recently purchased the right of this machine for the United States, now offers to make transfers of the right to run said machine, or sell to those who may be desirous to purchase the right for one or more of the States.

This machine is now in successful operation in ten or twelve iron works in and about the vicinity of Pittsburgh, also at Phoenixville and Reading, Pa., Covington Iron Works, Md., Troy Rolling Mills, and Troy Iron and Nail Factory, Troy, N. Y., where it has given universal satisfaction.

Its advantages over the ordinary Forge Hammer are numerous: considerable saving in first cost; saving in power; the entire saving of shingler's, or hammerman's wages, as no attendance whatever is necessary, it being entirely self-acting; saving in time from the quantity of work done, as one machine is capable of working the iron from sixty puddling furnaces; saving of waste, as nothing but the scoria is thrown off, and that most effectually; saving of staffs, as none are used or required. The time required to furnish a bloom being only about six seconds, the scoria has no time to set, consequently is got rid of much easier than when allowed to congeal as under the hammer. The iron being discharged from the machine so hot, rolls better and is much easier on the rollers and machinery. The bars roll rounder, and are much better finished. The subscriber feels confident that persons who will examine for themselves the machinery in operation, will find it possesses more advantages than have been enumerated. For further particulars address the subscriber at Troy, N. Y. **P. A. BURDEN.**

Railroad Spikes and Wrought Iron Fastenings.

THE TROY IRON AND NAIL FACTORY. The exclusive owner of all Henry Burden's Patented Machinery for making Spikes, have facilities for manufacturing large quantities upon short notice, and of a quality unsurpassed.

Wrought Iron Chairs, Clamps, Keys and Bolts for Railroad fastenings, also made to order. A full assortment of Ship and Boat Spikes always on hand.

All orders addressed to the Agent at the Factory will receive immediate attention.

P. A. BURDEN, Agent,
Troy Iron and Nail Factory, Troy, N. Y.

RAILROAD WHEELS.

CHILLED RAILROAD WHEELS.—THE UNDERSIGNED are now prepared to manufacture their Improved Corrugated Car Wheels, or Wheels with any form of spokes or discs, by a new process which prevents all strain on the metal, such as is produced in all other chilled wheels, by the manner of casting and cooling. By this new method of manufacture, the hubs of all kinds of wheels may be made whole—that is, without dividing them into sections—thus rendering the expense of banding unnecessary; and the wheels subjected to this process will be much stronger than those of the same size and weight, when made in the ordinary way.

A. WHITNEY & SON,
Willow St., below 13th,
Philadelphia, Pa.

CHILLED RAILROAD WHEELS.—THE UNDERSIGNED, the Original Inventor of the Plate Wheel with solid hub, is prepared to execute all orders for the same, promptly and faithfully, and solicits a share of the patronage for those kind of wheels which are now so much preferred, and which he originally produced after a large expenditure of time and money.

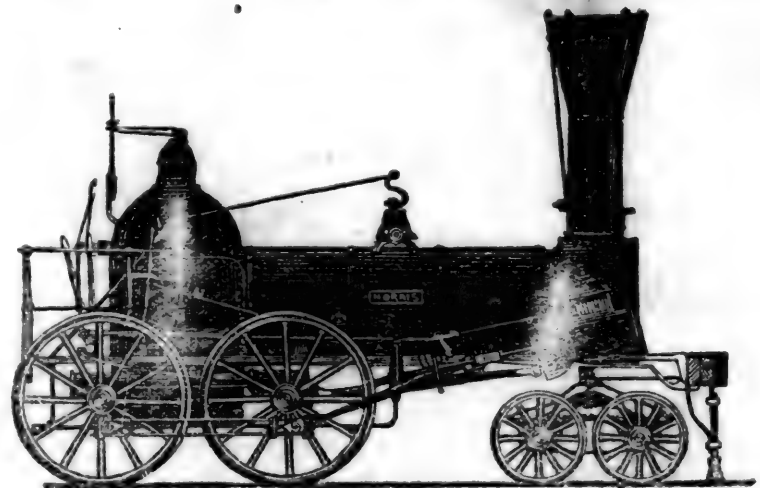
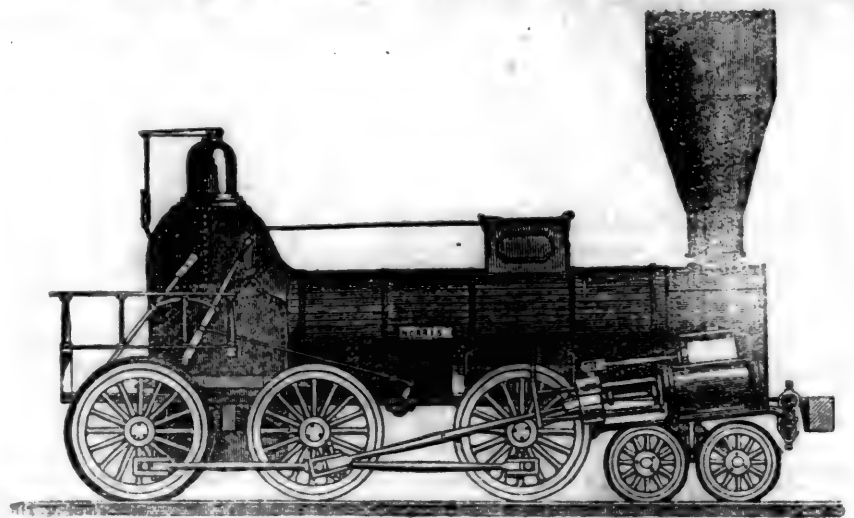
A. TIERS,
Point Pleasant Foundry.

He also offers to furnish Rolling Mill Castings, and other Mill Gearing, with promptness, having, he believes, the largest stock of such patterns to be found in the country.

Kensington, Philadelphia Co.,
March 12, 1848.

NORRIS' LOCOMOTIVE WORKS.

BUSHHILL, SCHUYLKILL SIXTH-ST., PHILADELPHIA,



THE UNDERSIGNED Manufacture to order Locomotive Steam Engines of any plan or size. Their shops being enlarged, and their arrangements considerably extended to facilitate the speedy execution of work in this branch, they can offer to Railway Companies unusual advantages for prompt delivery of Machinery of superior workmanship and finish.

Connected with the Locomotive business, they are also prepared to furnish, at short notice, Chilled Wheels for Cars of superior quality.

Wrought Iron Tyres made of any required size—the exact diameter of the Wheel Centre, being given, the Tyres are made to fit on same without the necessity of turning out inside.

Iron and Brass castings, Axles, etc., fitted up complete with Trucks or otherwise.

NORRIS, BROTHERS

LAWRENCE'S ROSENDALE HYDRAULIC Cement. This Cement is warranted equal to any manufactured in this country, and has been pronounced superior to Francis' "Roman." Its value for Aqueducts, Locks, Bridges, Flooms, and all Masonry exposed to dampness, is well known, as it sets immediately under water, and increases in solidity for years.

For sale in lots to suit purchasers, in tight papered barrels, by **JOHN W. LAWRENCE,**

142 Front-street, New York.

Orders for the above will be received and promptly attended to at this office. 32 ly.

PATENT MACHINE MADE HORSE-SHOES.

The Troy Iron and Nail Factory have always on hand a general assortment of Horse Shoes, made from Refined American Iron.

Four sizes being made, it will be well for those ordering to remember that the size of increases as the numbers—No. 1 being the smallest.

P. A. BURDEN, Agent,
Troy Iron and Nail Factory, Troy, N. Y.

Text Book of Mechanical Drawing,

FOR the use of SCHOOLS and SELF-INSTRUCTION, containing,

1st. A series of progressive practical problems in Geometry, with full explanations, couched in plain and simple terms; showing also the construction of the parallel ruler, plane scales and protractor.

2d. Examples for drawing plans, sections and elevations of Buildings and Machinery, the mode of drawing elevations from circular and polygonal plans, and the drawing of Roman and Grecian Mouldings.

3d. An introduction to Isometrical drawing, with 4 plates of examples.

4th. A treatise on Linear Perspective, with numerous examples and full explanations, rendering the study of the art easy and agreeable.

5th. Examples for the projection of shadows.

The whole illustrated with 50 STEEL PLATES.

Published by **WM. MINIFIE & CO.,**

114 Baltimore St., Baltimore Md.

Price \$3, to be had of all the principal booksellers.

AMERICAN RAILROAD JOURNAL.

STEAM NAVIGATION, COMMERCE, MINING, MANUFACTURES.

HENRY V. POOR, Editor.

ESTABLISHED 1831.

PUBLISHED WEEKLY, AT No. 136 NASSAU ST., NEW YORK, AT FIVE DOLLARS PER ANNUM IN ADVANCE.

SECOND QUARTO SERIES, VOL. VI., No. 7]

SATURDAY, FEBRUARY 16, 1850.

[WHOLE No. 722, VOL. XXIII.

ASSISTANT EDITORS,

J. T. HODGE, *For Mining and Metallurgy.*
GEN. CHAR. T. JAMES, *For Manufactures and the
Mechanic Arts.*
M. BUTT HEWSON, C. E., *For Civil Engineering.*

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American Railroad Journal.

PUBLISHED BY J. H. SCHULTZ & Co., 136 NASSAU ST.

Saturday, February 16, 1850.

Steam Boiler Explosion in Hague St.

For the purpose of presenting to our readers the most material evidence given before the jury of inquest, held upon those killed by the explosion, we give below the testimony of the following witnesses:—

Thomas B. Stillman, residing No. 70 Seventh street, examined.—I am a practical engineer, and one of the conductors of the Novelty iron works; I am acquainted with the generation and use of steam as a motive power; there are various forms of steam boilers—one kind has a cylindrical form without flues, a cylindrical form with large flues, and a cylindrical form with small or tubular flues; the next class is boilers of a box or square form, with large tubes and small flues or generators; another is a compound form, being partly cylindrical and partly square or box form; the tubular form of boiler is adapted to an internal pressure or an external; there are two general kinds of tubular boilers—those called locomotives, and the Nott or Montgomery boilers—the latter having the water inside the tubes; the former kind has it outside; the strongest form of boilers is cylindrical; other forms are used with safety when the pressure is

adapted to their form; the strength of boilers is best tested by applying steam or hydraulic pressure. The witness, on referring to the map of the boiler in question, said I find it to be an inverted arch in the bottom, which I believe to be weak or insufficient to sustain great pressure; the effect upon a boiler to lie by unused is not serious if properly protected by paint or covering against the weather; I have seen and examined the fragments of the boiler in question; I consider the explosion of the boiler to have been caused by undue pressure; it does not appear to have been burned or otherwise injured previous to the explosion; the fracture appears to have commenced at the bottom, or inverted arch, the shell of the boiler being bent longitudinally, and flattened almost into a plane, the tubes remaining uninjured; the iron appears to be good; should think from the thickness of the iron, and the bracing of some of the parts, and size of the shell, or outer part, that it is adapted to a pressure of twenty or thirty pounds to the square inch; some parts of the boiler appear to be sufficiently braced to carry a hundred pounds to the square inch; the bottom being, in this case, much the weakest part of the boiler, as shown by the drawings; the iron does not appear to have been overheated; if it were overheated, there would have been a scale on the surface, or it would have been what is called oxidised on those parts unduly exposed to the fire, in consequence of the water being too low; I do not know what pressure the boiler was subjected to at the time of the explosion; when boilers are injured for want of water, the parts over-heated are much weakened, and the failure generally commence at those parts; the fragments of the exploded boiler generally exhibit evidence of that fact; I do not consider that the boiler was used so frequently before its admission into that place as to be injured by such use; I do not think it necessary to assume the presence of explosive gas as necessary to the destruction of the boiler that took place.

Question by a juror.—If the presence of explosive gas did not cause this, what did? The jurymen wanted to have a definition of explosive gas. Mr. Stillman, in reply, stated in substance, that a weak place in a boiler would only let the water escape, but a generally weak shell would lead to an explosion. An explosion is a failure of the boiler, producing a concussion. Witness has known boilers to become weak and soft as sheet lead; he would call that an explosion. Of this boiler the materials appear to have been good; the inverted arch at the bottom of the boiler was weak. (The jury here examined again the diagram of the boiler and its several parts.) Witness never before saw a boiler built of this shape. To an inquiry by a juror, Mr. Stillman said that the explosion was general; it was all in fragments; the explosion was not owing to the giving way of any weak part; the number given to designate boilers refer to the thickness; a well constructed boiler of the greatest

thickness would bear 100 lbs. pressure before it would burst; this boiler, except as to the arch at the bottom, would safely bear 100 lbs. pressure on the square inch; the best of boilers can only carry safely 100 lbs.

A conversation here took place relating to the safety-valve, and the tendency of the evidence, as drawn forth by the jurymen's inquiries, went to show that the safety-valve was no security against the explosion; that the strength of explosion surpassed all the powers of any boiler whatever to sustain; that the explosive force of the gaseous fluid generated was sufficient, if suitably applied, to have lifted up all New York city from its foundations.

[Hence it is manifest that no strength of metal in the boiler could have prevented explosion, and no weakness of any parts of the boiler could have caused the disaster; for, if steam alone, and a flaw in the boiler alone, led to the disaster, then it is manifest the steam would have rent the boiler at the weak point, and would have escaped into free air—therefore, the universality of the explosion tends to prove the goodness of the boiler.]

Mr. A. B. Taylor, of Newark, N. J., testified:—The building was six stories high, the walls 18 in. thick to the third story, and 12 inches from that to the roof, which was covered with tin: the engine was in the cellar; with regard to the competency of Crissey as an engineer, I will say, that he came to me well recommended about 8 years ago, and on trial I found he gave good satisfaction; his wages were \$10 50 per week, and \$50 as a New Year's present; the supply pipe at the cock was perpendicular, and stood, I think, about opposite one of the windows of the basement where the engineer stood; a person standing at the feed cock I think would have been driven through the window into the yard where Crissey was found; we paid \$750 for the boiler and 40 dollars for repairs; in the conversation with Mr. Birbeck he stated to me that it would not be safe to carry more than 50 pounds to the square inch; I immediately ordered him to repair the boilers we had just taken down and build another of the same capacity as the one taken down; after this conversation I had requested Mr. Burr to take two of the machines from the building and send them to Newark; he had, however, at the time of the explosion removed but one; after the boiler had been repaired, Mr. Ford and myself came to the conclusion, after inspection, that the boiler would carry more steam, and I therefore increased it to 100 lbs. to the square inch, at the same time standing in front of it in perfect confidence of its strength; after which it continued to do our work at that pressure for two days previous to its explosion: I do not think my engineer would have gone beyond 100 lbs. to the square inch without my orders; it is my opinion that the arch in the bottom of the boiler was as strong as any other portion of it; on the 26th December last the water pipe was frozen, but cannot say that it was in the

same state on the morning of the explosion; if any censure is to fall upon any one of the concern in regard to the direction as to the increase of steam as ordered by myself, I only am responsible.

Henry R. Durham was next called.—Resides at 109 North Moore street; witness is engineer and machinist; has been employed in the business for twenty odd years past; has not examined the boiler at the ruins. (The valve is produced, and the sectional diagram of the boiler.) The valve is quite large enough for all the purposes of a safety-valve; in five minutes or less the valve, on being opened, would reduce the pressure from 150 to 20 pounds; a six inch valve would freely vent, and instantly relieve the largest boiler ever built; a valve of twelve inches would not have relieved the boiler in this explosion; nothing but the whole top of the boiler being open could have relieved this explosion by giving vent to the explosive gas, which acted instantaneously, too soon for any valve to give relief. A skilful engineer can take care of the boiler and property, no matter what the kind of boiler. Subjecting all boilers to a test, would do no good, for it would not make owners and engineers abstain from driving the machine beyond its powers. The only regulation to secure the lives of citizens, is the employment of skilful, able, and prudent engineers. [The jurymen said, he wanted some mechanical prevention.] Witness said all tests and securities dwindle to nothing when engineers are not careful; no laws or precautions can guard against carelessness or negligence; good gauge cocks, plenty of water, good force pumps, and prudent, intelligent, careful engineers, these alone can prevent accidents; good engineers always make, and always have good firemen; they would not use a dangerous boiler, they would not put on too high steam; it is impossible a boiler could explode by steam, as this boiler did; it exploded by a six thousand pound pressure, and it is impossible to raise steam to that point; steam can burst boilers, but it never explodes them as this boiler did; explosion is quite different from bursting.

Paul Stillman, resides at 93 Avenue C.—Affirmed that he had been eighteen years engaged with establishments constructing steam machinery, and was at present principally engaged in constructing gauges of various kinds for measuring the pressure of steam, height of water, &c.; has made the generation and motive power of steam a matter of examination and study about twenty years; his attention was first called to the danger of excessively heated boilers, by the report of the experiments of the late Jacob Perkins—conducted in London some twenty years ago; his earliest experience in the use of steam as a motive power, was had in a shop in which no person was particularly charged with the care of the engine, nor was there any person connected with the establishment that was accustomed to the use of a steam engine, excepting one of the proprietors, who might have had two or three weeks opportunity to see one in use; he saw at that establishment a cylinder boiler heated twice or more by the evaporation of all its water—one time so hot as to burn the packing of canvass and white lead from under the safety valve, so as to cause the sudden discharge of the steam made on injecting a quantity of water—the other time so as to stop the engine, which received no injury from injecting water; subsequently the engine was exchanged for a larger one, and the boiler for a Nott's boiler; saw that boiler treated in the same manner; on one occasion the proprietor, who was engaged near the boiler, took charge of the boiler, which was in a basement, and neglected the water until he found the engine stopping, and went to the boiler, and finding no water, opened the large door at the side of the tubes, and found all the tubes hot—those in front at high red, and those at the back at a low red heat, and that he put on the feed and saw the tubes cooled by the water as it rose in them, until the boiler was cooled, and that the engine was not stopped, nor did any other injury appear than the trifling leak of the tubes; the other time it was treated the same, or nearly so; had been now about 15 years connected with the establishment in this city known as the Novelty iron works; had given more or less attention to the method there pursued in making and staying the various kinds of boilers made at the establishment during that time; in consequence of the incidents occurring,

while a boy, as stated above, had been induced to give much attention to the reports and investigations of causes of boiler explosions; had heard the particulars of many, some of which have been violent and with full allowance of water, other without water or violence; have known several arches to fire boxes of "locomotives," or tubular flue boilers, give way in consequence of excessive heat, but without explosion; was acquainted with the various theories of explosions, and did not think that the want of water was a necessary condition to produce explosions, may cause it, and stated how; did not believe in the possibility of explosive gas; had seen the ruin said to have been the boiler late in use in the establishment of A. B. Taylor; had compared it with the drawing by which it was said to have been made; had seen the boiler in the possession of Pease & Murphy; thought it well made, so far as workmanship was concerned; did not notice particularly the defect pointed out in the plan shown; did not think that an inverted arch could safely be used in the shell or outer shell of a boiler; he thought that the plan shown here was eminently calculated to produce an explosion; that with sufficient force to crush the arch at the bottom of the boiler, it would necessarily explode, independent of any condition of water; thought that an inverted arch was far more dangerous in the shell than in the flues or fire-box; had never before seen an arch so imperfectly stayed, as he thought from the plans and explanations and appearance of the boiler, that this one was; had made particular examination of the safety valve; it was not so large as he had been accustomed to see used for such sized boilers, but was larger than necessary to relieve the boiler of steam as fast as, under ordinary circumstances, it could be generated; the valve shown is at the lower edge of disc $2\frac{1}{2}$ inches diameter, or of an area of 4.9; the lever was $32\frac{1}{2}$ inches long; had a fulcrum of $3\frac{1}{2}$ inches from valve bearing; leverage was 10.44, and the lever and valve rested on the seat with a weight of 24 lbs. nearly; that the weight attached to lever weighed 30 lbs. 10 oz.; if the valve was at the end of the lever, it would resist a pressure of 112.72 per square inch of valve; that there is a mark on the valve lever, caused by staple in the weight; about $1\frac{1}{2}$ inches from end, near which was a cord, as I am told, by which the valve was lifted to blow off steam; it is probable, therefore, that the weight was not at the extreme end, and that a corresponding reduction ought to be made; it would still leave a pressure of 107.58; allowing the length of the arch described by the arch or flue, to be five feet, it would give a pressure of 6.454 80 pounds for each inch in its length, or 77.457 per foot; the length of the arch was five feet, which would give an aggregate of 194 tons nearly; to sustain this pressure there could, from the peculiar construction of the boiler, be no adequate bracing. Allowing the arch to have fallen—and there is, in the position of two of the braces left, strong evidence that it did—there was no abutment or stay which could have arrested the spreading of the sides, and consequently the whole bottom and sides would have nothing to prevent it from assuming a cylindrical form, tearing off the stud braces, and compressing the inner sheets as we find them. In taking that form, it is impossible that it could have escaped rending and a rent of any considerable size having been made, the velocity of the steam, driven as it was by the pressure and the momentum acquired by the rending parts, would cause it to extend instantly in every direction. The shell of the boiler being rent in two, the ends, would fly up, and probably throw off the narrow ends which formed the deepest part of the boiler, and continuing its motion up until entirely disengaged from the boiler, would proceed up through the several floors that it is known to have gone through, while the other parts would be thrown in the various directions found, according to the circumstances under which they separated from the central part of the boiler. The effect on the boiler he did not think to be attributed to the velocity of the escaping steam, nor upon the building, by the instantaneous introduction of from six to ten times the contents of the boiler into the engine room. A tornado which tears up trees, &c., is said to move with a velocity of 8,800 feet per minute, and with a force of 50 pounds per foot; in this case a tornado let loose upon the boiler, moving

with an impulse of 167 pounds per inch, or 300 times the velocity of a tornado; he mentioned the bursting of a cannon by the Marquis of Worcester, the discoverer in England of the power of steam; also, of the bursting of a breach of a musket by charging it with water, and firing strongly upon it in a forge, causing it to explode violently, either of which required a force of from 6,000 to 8,000 pounds per inch; he thought that, from the appearance of the tubes of the boiler, and their generally being perfectly tight, as well as from the general appearance of the boiler, that there could have been no want of water, thought it may not have appeared at the water gauge, which is always placed some inches above the flues. That there was no question in his own mind, that the only cause of the explosion was that the boiler was subjected to an amount of pressure to which, from the defects named, there could have been no adequate strength.

Mr. John St. John was the next witness examined.—Witness is familiar with the use of steam and steam engines for more than twenty years. Bursting is when a boiler gives way by steam; an explosion is a different thing; it proceeds not from the steam, but from the ignition of an unknown gas; a fusible safety valve is the best to prevent the explosion of boilers by showing the heat; ignition is sufficient for explosion; explosion is not by steam; steam only causes bursting, and escape of steam; witness here stated the best means to prevent explosion; witness believes the gas which causes explosion is an ignitable gas; thinks it ignited in the present instance; thinks steam would never produce such an explosion; when steam rises to its highest degree, it loses its elasticity, and becomes an inert gas; the fusible valve is used in France by law, as witness believes.

Joseph Brown, residing at 322 Fifth street.—Am acquainted with Mr. Cressey, the engineer; had known him going on four years; I think he understood when there was a proper head of steam and a full supply of water; never knew him to be careless until the morning of the explosion; on that morning his neglect consisted in not attending to a proper supply of water in the boiler; I know this by trying it myself, probably four minutes before the accident occurred; I could not tell how much water was in the boiler, for the gauge did not show any; I then tried the steam by lifting the safety valve, and saw that it was not of the usual color of steam that comes from boilers; it was of a sky colored blue; I remarked, "Mr. Crissey, your steam seems to be dry;" he stated that he knew his own business; I told him if that was the way he was going to carry steam, I should soon be going; I remarked to one of the men when I got to the shop, that it was curious steam they had got out there; saw that the gaskets around the hand-holes were smoking; gaskets consist of hemp twisted up and mixed with white lead to make a joint; I stood then by my fire in the shop, thinking what I should do, having a boy up stairs of my own, and fearing that there was danger of the boiler bursting; I had but a minute or two to think before the boiler did burst; I then hallooed to the apprentice boy working with me, "jump, Charles, for the boiler has burst!" he jumped with me, but one timber caught him, and he did not get so far as I did; he finally escaped, however, with me, slightly injured; Crissey was perfectly sober at the time, though he was somewhat agitated in the morning about the watchman making a fire; what the misunderstanding between them was I know not; I was the head blacksmith in the establishment.

Mr. Murphy, of the firm of Pease & Murphy, was next sworn.—Witness is a practical boiler maker; resides 552 East Broadway; has examined the boiler in question, and believes there was plenty of water in the boiler when it exploded; he thinks there was too great a pressure of steam on; it was not built by witness; he is not in favor of this kind of a boiler, from weakness of the valve. In reply to a juror, witness said he never knew of a boiler bursting when it was well supplied with water; he never heard of such a thing.

To the coroner.—This engine was not large enough to propel the machinery to which it was attached.

Mr. D. Fanshaw, printer, of Nassau st., was the next witness called.—Witness believes that the

feed pipe was frozen from coldness of the previous night, and when the fire was lighted on Monday morning a gas was generated, in the absence of sufficient water, stronger than gunpowder itself, the force-pump supplying no water to the boiler.

By a juror—What is the reason the tubes of the Nott boiler becomes weak? Witness found the flat boilers safest, and used them till he heard of Nott's boilers, which he found to be the safest; if there is an explosion of these boilers, it is only occasionally of a worn out tube; these boilers are used on the ferry boats; witness has had twenty explosions, at least; they do no harm, merely put out the fire, and the tube is replaced by a new tube in the time of an hour; each tube is a boiler. Q.—Could hydrogen gas explode without contact with the outer air? Witness answered by referring to Perkins' experiments, which show that explosions are not caused by any intensity of steam, but by the generation of a gas, believed to be hydrogen gas; witness never knew a boiler to explode like this, when supplied with water.

Joseph B. Coffee, examined.—I reside at 286 Washington street, I think the boiler burst from an over pressure of steam, (having 100 lbs. when its capacity was only 50 lbs. to the square inch,) there was a sufficient quantity of water in the boiler, and the destruction was caused, not by the explosive force of ignited gases, but by the expansive force of steam, which at that pressure is sufficient to produce such a result; the peculiarity in the construction of the boiler consisted in the arch, under the lower flue head; there being no braces on the top of it, and the bottom or legs of the boiler having no cross tie to support it, the arch and the legs were the first to give way, being the weakest part.

The testimony of Jeremiah S. Bunce was nearly identical in significance.

W. E. Milligan, examined.—I reside at 422 Washington street; I am a practical boiler maker, and have been in this business about fifteen years; I was one of the firm of Milligan & Walker, at the time the boiler in question was built; it was built for A. B. Taylor, for a twelve-inch diameter of cylinder, four and a half feet stroke, from drawings sanctioned by Mr. Montgomery, and calculated to carry forty pounds of steam to the square inch; the construction of this kind of boiler demands considerable height, on account of the tubes being vertical; to obviate this, I suggested the form of a water lead, which would have admitted of a well braced abutment to resist the spread of the arch, and submitted it to Mr. Montgomery in a letter, which I understood he would produce, but he thought he had better not, as it would prove I had no control of the boiler, or I would have built it in the form I suggested myself; I positively say I made no alteration in the boiler without Mr. Montgomery's consent, knowing him to be a very violent man. The only objection made to the boiler was on account of some tube holes in the centre of the sheets, that my machine would not drill, which was drilled at Mr. Taylor's establishment and drilled too large; Mr. Montgomery wanted me to throw away the sheets on that account; I told him it was Mr. Taylor's fault, and he ought to pay the loss; but Mr. Taylor was not willing, and asked me if I could not make them answer; I told him I could, and did; when the boiler was finished, all the fault they found with it was that it had too much space at the side for the draft.

The Georgia steamboat company bought it, and said it had not enough, and that the smoke would not clear itself; during this time, Mr. Taylor took out the engine the boiler was built for, and put in 16 inch diameter of cylinder, 4 feet stroke, nearly double the capacity, and bought the same boiler to drive it; I did not make alterations on this boiler as Mr. Montgomery asserted before it went south; it is my opinion the explosion was caused by the safety valve being weighed at 112 pounds when the boiler was only intended to carry 40 pounds to the square inch. Mr. Milligan here produced bills from Messrs. Kemble and Prosser, showing that he purchased the best iron tubes, and that the boiler was built in every respect according to order and contract.

Paul Stillman then gave additional testimony, for the purpose of rebutting the last witness. He said:—I was applied to by Mr. Taylor, who left

word at my house to call on him; I did call, but did not see him; I saw his foreman Mr. Ford, who told me Mr. Taylor wanted to see me; I did not see him till this day 11th of February, when he informed me that his object in trying to see me, was to say that the gauge of mine he had seen was only gauged to 130 lbs. and he wished a gauge from me that would gauge 150 lbs. pressure; at that time, Mr. Taylor called on me, concerning this matter, it was about one year ago, he was then using the old cylinder boilers, for which one that exploded was to have been substituted. To a juror—I knew the boiler was only to carry forty pounds, and I think Mr. Taylor knew it, too, but I am not sure.

Verdict.—The grand inquest for the coroner, inquiring into the cause or causes of the late sad catastrophe at Nos. 5 and 7 Hague-st., which occurred on the morning of the 4th of February, 1850, between hours of 7 and 8 o'clock, having heard the testimony and evidence by various witnesses, summoned by the coroner, and having the received the charge of said coroner, retired and come to the following unanimous conclusions:

First: That Messrs. A. B. Taylor & Co., were the direct cause of the recent explosion in Hague street.

Second: That Messrs. Walker & Milligan, were the indirect cause of the recent explosion in Hague street.

Third: That Messrs. Pease & Murphy are deeply reprehensible in selling the boiler, knowing its imperfections, and after it had lain in the open air for more than one year.

JAMES RENWICK, Foreman.

The grand inquest also presented the following resolutions, which were unanimously adopted:

1st. Resolved, That our national and state legislature and municipal governments should take immediate steps to prevent the recurrence of a similar calamity.

2nd. Resolved, That it be respectfully suggested to the mayor, aldermen and commonalty of the city of New York, that an ordinance should be framed enacting, that the proprietors of the factories or buildings in which steam engines are employed, be compelled to construct separate buildings for the reception of the boilers, or to place them in their yards, where so much danger cannot be engendered.

ROYAL SCOTTISH SOCIETY OF ARTS.

Strength of Materials.

"At the request of the Council an Experimental Exposition was given, containing his concluding observations on the 'Strength of Materials,' as applicable to the construction of Cast or Wrought Iron Bridges, and on the Conway and Britannia Tubular Bridges." (Part I.) By Geo. Buchanan, Esq., F.R.S.E., late Pres't R.S.S.A.

In this exposition, Mr. Buchanan, after apologizing for the length to which he had been imperceptibly drawn in these communications, commenced by recapitulating the general principles which had formerly been laid down regarding the tensile and compressive strains of materials, and, in addition to the results of former experiments, made at the request of the society, on the stones from different quarries in the neighborhood, now gave the result of others which had since been carefully made on the harder materials of Caithness and Arbroath pavement, along with white marble and whinstone, as follows, viz:

	Tensile.	Compressive.
Whinstone.....	1469 lbs.	8270 lbs.
Arbroath pavement.	1261	7884
Caithness do.....	1054	6493
Marble.....	792	6431

In all these experiments the peculiar nature of the two strains is distinctly exhibited; the specimens exposed to the tensile strain showing a clean fracture and no fragments; those exposed to the compressive being generally crushed to powder, and the fragments flying in all directions by lateral divergence; and generally, when any considerable fragment remains, showing the appearance of a pyramid from which the sides of a square had been broken—a form which has also been observed in the compression of cast iron.

In regard to the transverse strength, he repeated the principles and general rule for calculation for-

merly explained by adopting what he termed a unit of strength, which differs in each material; but being once determined by actual experiment, affords a datum for calculating the strength of that material in every case, whatever be the dimensions of the masses acted on. This unit expresses the strength of a cubic inch of the material, i.e., a bar 1 inch square, supported on bearings 1 inch apart, and loaded in the middle till it breaks. The strength of such a unit for cast iron had been given on a former evening at 11 tons. In regard to timber, he had himself made various experiments on Memel fir, and had found the unit 4,000 lbs. Oak and beech, by other experimenters, was found 6,000 lb.—ash, 8,000 lbs.

In regard to the transverse strength of stones, few experiments, he said, had been made on our building materials, although it was a strain they were much subjected to in stairs, balconies, covers of conduits, etc. He proposed therefore to try several specimens which were now before the meeting, viz: Hailes pavement, Craigleith, and Arbroath. Each of these specimens was 3 inches thick, 9 in. broad, laid flatwise and supported at each end between two upright pillars, the distance between the bearings being exactly 3 feet. These specimens were loaded by weights successively laid on a scale hung from the centre of the pavement, until it broke. The Hailes was first tried, and, after carrying successively 4 cwt. and 5 cwt. for a little time, at last it gave way with 7 cwt. 10 lbs. A specimen of the same rock and dimensions previously tried gave nearly the same result, being 7½ cwt. The Craigleith carried considerably more. After bearing 7 cwt. and 8 cwt. for some time, it gave way at last with 10½ cwt. The Arbroath pavement was found still greatly ahead even of the Craigleith. After carrying 12 cwt. and 14 cwt. for some time, it went on bearing 16½ cwt. This it bore for a short interval; and while an additional weight was in the act of being put on it gave way. These experiments are important, and appear to excite much interest. From these the unit of strength is easily calculated.

The transverse strength and the forms of cast iron girders for spanning wide openings were formerly explained, and the application of malleable iron in the form of hollow tubes or girders; and, connected with this subject, he explained a plan which had lately been proposed by Mr. Beardmore, C.E., London, who had favored him with the results of some interesting experiments made by him. The plan consisted in constructing fire proof or other floors by girders, consisting merely of thin plates of sheet iron running parallel to each other at intervals, like ordinary joists resting on the walls at each end; these plates strengthened and united to angle irons on the top, and to a thin plate below running the whole way between the girders. The interval between them is filled up with a mass of concrete, the use of which is chiefly to keep the thin plate girders in their place, so that being incapable of bending, the full effect of the section of the iron is obtained, whereby the strength of such flooring, considering the thickness of the metal employed, is remarkable. In one experiment, where the girder consisted of sheet iron, No. 14 gage, or one-twelfth of an inch thick and 13 inches deep, and placed 13 inches apart, and the length or span between the walls or bearings 23 feet—also the total sectional area 6½ inches, while that of the concrete was 331 inches. This was loaded 8,000 lbs., which is nearly double the weight of any number of persons that could have room to stand on the beam, and only deflected ½ inch. With 12,000 lbs. it deflected about 1 inch, which was considered the probable limit of safe deflection. With 13,670 lbs. it deflected 1 inch; it was not loaded farther, but the calculated breaking weight was 25,000 pounds. Mr. Buchanan then showed a model of a floor on this principle, consisting of the thinnest tin plate iron girders, 3 feet long, 1½ inch deep, and 2 inches apart, and the spaces filled in with plaster of Paris. Even this slender material carried with safety a person standing in the middle, and gave way with 3 cwt., chiefly owing to the joints in the bottom plate not being soldered, but merely laid over.

In regard to the application of hollow girders, or tubes, and the wonderful discoveries on this subject which the progress of engineering works had recently brought to light in the construction of the

Conway and Britannia tubular bridges, he had formerly given a particular account of these, and had only now further to add, that he had the pleasure recently of visiting these structures, and was in every respect highly gratified with the result, and with the progress and state of the works, which were all pointed out to him and explained in the most liberal manner by Mr. Edwin Clarke, the very able and accomplished engineer on whom the active charge of the principal department in this undertaking has been devolved by Mr. Stephenson.

The Conway bridge, as we know, has been long since finished, and the trains on the Chester and Holyhead railway are seen daily passing and repassing. It ceases already to be any longer a wonder in the neighborhood, yet the stranger pauses to gaze with admiration on this extraordinary triumph of science and engineering skill, as the train enters the tube, and again emerges under the walls of the magnificent remains of Conway castle. In passing through the tube the sound of the train is peculiar but not greatly louder than in ordinary tunnels.—No sensible tremor or vibration is experienced, and the heaviest trains, when observed externally, do not produce any visible deflection. The line of the under surface of the tube is quite horizontal. The upper surface rises with a gentle curve towards the centre. The under surface had also when constructed a slight rise or camber in the centre of about seven or eight inches; but when the supports were removed from beneath, leaving it standing on the two extremities, it sunk in the middle by its own weight into a straight line, and this exactly as was intended by the engineers: showing the accuracy of the principles and data on which such nice calculations could previously be made of the probable deflection, and this chiefly from the experiments on the model tube by Mr. Fairbairn, described on a former evening.

The Britannia bridge, to which he next proceeded, is a still greater work even than the Conway, and connected with many circumstances calculated to impart interest to this structure, and everything connected with it. The curiosity and wonder excited by the famous bridge of suspension over the Menai straits were great; and he well recollected visiting this work during its progress, and the vast operations, as they were then considered, of fabricating connecting, and finally lifting the enormous chains of which it is composed, each of which after all hardly exceeded one hundred tons, between rock and rock, and the central portion, which alone had to be lifted by one purchase, not above thirty or forty tons. The principle of suspension also was not quite new, but had previously been exemplified in structures of considerable magnitude; still this was considered, and justly, an astonishing effort of skill, and remains a monument of the genius of Telford. What must we think, then, of the structure now in progress, and already seen partly spanning the same straits, which is not only new in principle, and untried before the great experiment of the Conway, but where the entire bridge itself, nearly 2,000 tons in weight, requires not only to be floated on the water from the place of its construction, but then raised more than 100 feet in perpendicular altitude in one mass, and by one mighty purchase, to its seat on the top of the towers prepared for it. What extraordinary strength of materials—of chains, bolts, bars and connections does not this imply! What amazing sources of mechanical power and combination in the lifting machinery! What consummate arrangements, in launching the gigantic mass into the troubled waters of these straits, and steering it with safety to its destination! All these circumstances tend to raise a singular degree of interest in this structure and the operations connected with it, and the result fully realised his anticipations, of which however he could only give but a faint idea by description.

The first view which the traveller obtains is in crossing the straits by the present suspension bridge. Looking about a mile to the westward, the towers of the Britannia bridge are seen rising with imposing effect—the centre one, as it were, from out of the water—the two exterior ones from the edge of the waters, and the terminal pillars or abutments on the top of the high ground on each side. But the object to which the attention above all becomes riveted, is the appearance of an extended wall or

roadway spanning the 460 feet opening between the Britannia tower and the Anglessea shore. This is the first of the four tubes which has been raised to its elevation of 103 feet above the waters. This is in fact *The Bridge*, standing without any appearance of support, and totally unlike any of the great works of this kind which have hitherto formed the pride of the architect and engineer. No more the noble arch rising, as we often see, so magnificently from the level of the opposite shores—nor the light and elegant curve of suspension hanging with such regular and airy proportions between the lofty towers on each side, but a figure perfectly horizontal and nearly rectilinear, spanning the opening and resting on the opposite towers—a figure certainly unequal to the others in beauty, but yet raising in the mind a sensation irresistibly striking, as exhibiting on such a magnificent scale the successful development of a new, grand and simple idea in mechanical science.

Mr. Buchanan then proceeded to give an interesting description of the situation of the bridge, the romantic shores of the estuary, the extraordinary phenomena of its tides rushing in from the great sea at either extremity, and producing, by the concurrence of waters and other circumstances, peculiar anomalies, and, above all, currents, running often at the rate of seven and eight miles an hour; and lastly, the extraordinary and exciting operations connected with the launching of the first great tube, and floating it through those waters and currents; the difficulties, the dangers, and the singular incidents which occurred during the brief and trying moments of this extraordinary enterprise, but which, by the long-matured and perfect arrangements previously made, all ended in depositing it safely on its site between the piers.

The next great operation to be described was that of the lifting of the tube, but the description of which, owing to the important business before the society this evening, of distributing the annual prizes to the successful competitors for inventions and communications, was necessarily deferred to another evening. In conclusion, particular reference was made to the great work which is now preparing by Mr. Edwin Clarke, with Mr. Stephenson's sanction and advice, being a history and description of the Conway and Britannia tubular bridges, with all the operations, and illustrated by very numerous drawings, on a large scale, of the details of the work, and also an account of the various experiments on the strength of iron, rivetted joints, etc., some of the results of which, as communicated to him by Mr. Clarke, he would state at the next meeting.—*C. E. & A. Journal.*

Institute of British Architects.

An exceedingly full meeting took place at the institution on Monday evening, the 19th of Nov. Dr. Buckland commenced a paper on Artesian Wells by observing, that the architecture of the globe was a subject which he thought ought not to be foreign to the consideration of the members of an architectural institute, for he must humbly submit that no architect could perfectly understand his profession unless he had acquired some knowledge of the materials with which he had to deal; and he believed no one would deny that, had their ancestors known as much as they did now, touching the durability of various kinds of stone employed in the construction of ecclesiastical and castellated buildings, they would not have to deplore the ruin of so many of those edifices. It would be his duty to-night to direct their attention to the architecture of that portion of the earth which they themselves inhabited—a subject possessing an interest literally of vital importance. It was, as had been proved by the events of the last six months, a question of life or death to thousands and ten of thousand in this great metropolis, whether they should have the means of obtaining an abundant supply of fresh water. It was, unfortunately, too notorious that the supply of water was at the present time awfully defective, and the last month had been fertile in schemes of various kinds for supplying that defect. He would not enter into the relative merits of those schemes, but he would explain them—so far as it was ascertained—the structure of that portion of the earth on which they dwell in this great metropolis. He had affixed the term "Artesian wells" to the subject on which he had to address them.

In his "Bridgewater treatise," which was published 13 years ago, he had written a chapter on this subject, and he might say that the result of his observations in England had been entirely confirmed by the practical experience of some of the most eminent scientific men in Germany and France. Among the latter, were M. Héricart de Thury, and M. Arago. It had been asserted that sufficient quantity of water might be obtained in this metropolis, by Artesian wells, to afford an ample supply to ten such cities as London; but he would venture to affirm, that though there were from 250 to 300 so-called Artesian wells in the metropolis, there was not one real Artesian well within three miles of St. Paul's. An Artesian well was a well that was always overflowing, either from its natural source or from an artificial tube; and when the overflowing ceased it was no longer an Artesian well. Twenty or thirty years ago there were many Artesian wells in the neighborhood of the metropolis, namely, in the gardens of the Horticultural society, in the gardens of the Bishop of London at Fulham, and in Brentford and its vicinity; but the wells which were now made by boring through the London clay were merely common wells. He had heard it said that the Artesian wells might be made in any part of London, because there was a supply of water which would rise of its own accord; but he could state, with regard to the water obtained to supply the fountains in Trafalgar-square, that it did not rise with 40 feet of the surface (a voice—"80 feet"); it was pumped up by means of a steam engine, and the requisite supply of water could be obtained at a much less cost from the Chelsea waterworks. Indeed, the same water was pumped up over and over again. (A laugh.) No less than £18,000 had been spent upon an Artesian well which had been made on Southampton common, but the water never had risen within 80 feet of the surface, and never would rise any higher. The supply of water formerly obtained from the so-called Artesian wells in London, had been greatly diminished by the sinking of new wells. Many of the large brewers in the metropolis who obtained water from these wells had been greatly inconvenienced by the failure of the supply; and he had received a letter from a gentleman connected with a brewer's establishment, stating that the water in their well was now 188 feet below the surface, while a short time ago it used to rise to within 95 feet of the surface. Indeed, the large brewers were actually on the point of bankruptcy with regard to a supply of water. (A laugh.) There were, as he had said, more than 250 Artesian wells, falsely so-called, in London, one-half of which had broken down; and those from which water was obtained were only kept in action at enormous expense. The average depth at which water could now be obtained from so-called Artesian wells in London was 60 feet below the Trinity-house water mark; and he believed that in 20 or 25 years more water would not be obtained at a less depth than 120 feet. This was, as he had said, a subject of vast importance to the inhabitants of the metropolis, who had not now a supply of water equal to one-fourth of what was required for their ordinary use. The Rev. Doctor, after going into a lengthy and elaborate geological description of the soil in the metropolis and the neighboring districts, illustrating his observations with well executed and interesting plans and sections, proceeded to inquire by what means a sufficient supply of water could be obtained for the inhabitants of the metropolis? He considered that an ample supply might be obtained from the Thames in the neighborhood of Henley, after that river had been fed by the Loddon, the Kennett, and other tributary streams. The water might be conveyed to London by an open aqueduct of sufficient depth, parallel with the Great Western railway; and it would have a fall of three feet, it would flow without the aid of any engineering works, and might be brought to a reservoir in a valley north of Paddington. It would there be at a level of 105 feet above high water mark, and at that level two-thirds of the inhabitants of London might, by means of an engine, be supplied with water at high-pressure.

The Rev. Dean, in the course of his paper, referred to the derivation of the word "Artesian." An Artesian well was a sort of well found in the time of the Romans, in arch walls. They were the

Artesia of the Romans. When an Artesian well ceased to overflow, it ceased to be an Artesian well. The Rev. gentleman concluded by saying that upon careful consideration, the plan to which he alluded appeared to him the most feasible that had yet been suggested for affording to all the inhabitants of this metropolis an abundant supply of pure water; and he sat down amid loud and general applause.—*London Artizan*.

Fluctuation in Railway Property in England in 1849.

The following comparison of the highest and lowest prices of the principal railway stocks on the London Exchange during last year exhibits the extreme fluctuation which has taken place in this class of securities. While consols have fluctuated from 96½ to 88½, or 8 per cent. during the year, it will be seen that the variations in the market prices of railway shares have been from 30 to 75 per cent.

	Highest price during the year.	Lowest price during the year.	Difference.
London and N.W.	143	104½	38½
Great Western	105½	48	57½
South Eastern	26½	16½	10½
Brighton	82½	6	76½
South Western	89	55	34
Eastern Counties	12½	6½	5½
Great Northern	11½	6½	5½
Lancashire and Yorkshire	83	54½	28½
Midland	99½	42½	57½
Edinburgh and Glasgow	44	26½	17½
Caledonian	27	10	17
York, Newcastle and Berwick	30½	16	14½
York and N. Midland	59½	16½	43
Great Southern and Western (Ireland)	37½	24½	13
North Staffordshire	17½	7½	9½
Amiens and Boulogne	10½	5	5½
Northern of France	14½	9½	4½

Present Market Value of Railway Property in England.

Mr. Allsop, of the Royal Exchange buildings gives in his circular, dated the 15th of January, a comparison of the present market value of the 12 principal trunk railways with that of January, 1849, viz: the Caledonian, Chester and Holyhead, Eastern Counties, Lancaster and Carlisle, Great Western, London and North Western, South Western, Midland, North British, South Eastern, York and North Midland, and York and Newcastle, and Berwick. He states that the par value of the ordinary share capital amounts in the aggregate to £72,644,215, the market value of which on the 9th of January, 1849, £65,887,058, and on the 9th of January, 1850, £45,818,515, showing a depreciation of £20,058,542, or nearly 30 per cent in the course of the year. The par value of the preference shares in those lines amounts to £5,882,200; the market value of them on the 9th January, 1849, was £6,040,288, and on the 9th January, 1850, but £4,817,603, showing a depreciation of £1,341,918, or about 22 per cent. He goes on to state that the capital represented in the above, which does not include either the various leased and local lines, or any portion of the respective stocks not negotiable in the London market, is £78,526,415, and the total depreciation £21,281,227, or 27½ per cent. on the par value: and as this does not exceed one-fourth of the total amount expended on railways in the United Kingdom, the above results will serve to indicate the loss sustained by shareholders in the twelvemonth just expired.

His reasons for this belief are briefly as follows:—That as yet, some of the leading railway companies have closed their capital accounts; nor, with the exception of the London and Brighton and the Edinburgh and Glasgow—have any of them taken decided steps towards this end. That until capital accounts be closed, there can be no data by which to ascertain the real cost of working railways; and consequently, uncertainty and doubt as to the reality and permanence of dividends. That the competition of new and undeveloped lines will continue to operate for some time longer, in coun-

teraction of the increase which may be legitimately expected from reviving trade. These are the chief influences likely to affect injudiciously the value of railway property; and in proportion as individual lines emerge from these evils, will public favor be extended to them.—*Herald's Journal*.

The Progress of Railroads.

It is interesting to look back to the commencement of the railroad enterprise in this commonwealth, and examine the estimates of income and expenses then made on some of the leading roads, and compare them with the actual receipts and expenditures at the present time. Take, for instance, the Boston and Worcester road. The following is from the Worcester Spy of July 16, 1831:—

"*Boston and Worcester Railroad*.—It is cheering to observe the spirit manifested by the capitalists of Boston in relation to a railroad between the city and this town. The act of incorporation of the company provides that the capital stock shall consist of ten thousand shares, not to exceed one hundred dollars per share, and the price of shares has been fixed at that sum. In estimating the profits of the undertaking, the income from passengers to be conveyed by four locomotive engines is computed at \$71,370 per year. The average amount of travelling in the stages now running between Boston and Worcester, is \$44,720, exclusive of the smaller lines, which, together with the travel likely to be attracted by the railroad, will give the above amount, estimating the fare at \$1 50 for each passage between the places. As to the quantity of goods to be transported, it is computed that the amount of the present business which would be accommodated by the railroad, would require a transportation equivalent to 18,000 tons, for which, at \$3 per ton, the receipts would be \$54,000. The expenses for repairs of the road and of the locomotives engines, the cost of fuel, &c., the salaries of superintendents and workmen, are set at \$33,570 per annum, so that a net income of \$86,800 may be safely expected. Such is the estimate made by the very intelligent committee of the corporation, and contained in their circular."

It appears from the above that a very intelligent committee, in their circular to the public, estimate the total income from all sources to be \$125,370.

Say for passengers	\$71,370
" freight	54,000
	\$125,370
Expenses	38,570
	\$86,800

Net income, eighty-six thousand eight hundred dollars. Compare these figures with those in the report just issued to the stockholders of the corporation, and the result shows an increase of net income the last year over the estimates made in 1831, of one hundred eighty-seven thousand one hundred seventeen dollars and eighty cents.

It will be seen by the report referred to, that the total receipts for the year ending 30th of November, were \$703,361 15

Expenses 429,443 35

Net income \$273,917 90

The very intelligent committee say in their circular that it will take four locomotive engines to do the business of the road. At the present time it requires twenty-nine.—*Boston Traveller*.

Michigan.

Michigan Southern Railroad.—The subscription of \$250,000 applied for by the Michigan Southern Railroad Company for the extension from Hillsdale to Coldwater, has been taken, a large portion of it by the citizens of Jonesville and Coldwater and other places along the line. A contract has been made with the Messrs. Harback, Witt & Co., (the contractors of the Cleveland and Columbia Road.) for the construction of the division between Hillsdale and Coldwater, the work has been commenced and is now in progress. The division is 22 miles in length, and is to be completed by the first day of August next. The cost of it when finished, according to the contract price, and laid with a heavy iron rail, will not exceed \$12,000 per mile.

Georgia.

Macon and Western Railroad.—At a meeting of this company, held at the company's office in the city of Macon pursuant to the by-laws, on the first Tuesday in January, 1850, on motion of Isaac Scott, Esq., the meeting was organized by calling the Hon. Charles J. McDonald to the chair, and I. H. Taylor to act as secretary.

The president presented the fourth annual report to the stockholders, which was read and approved, and, on motion of Andrew Low, Esq., was ordered to be printed.

On motion of Edward Padelford, Esq., the following resolution was read and unanimously adopted: *Resolved*, That this meeting is highly gratified at the management of the board for the last twelve months, and at the zeal and fidelity of each officer of the company in the discharge of his appropriate duties.

Maine.

Androscoggin Railroad.—The work of grading on this road is progressing finely. Parties are at work on five different sections, and something like 30,000 yards of earth were excavated last month. As a general fact, the pits work remarkably easy, and it is believed the contractors will complete their contracts with profit. Thus far, no road in New England has been undertaken under more favorable auspices. Opening as it does into one of the richest agricultural sections of the state, being free from all competition, and being constructed at an expense less than one third the average cost of our New England roads, it cannot be otherwise than a profitable investment for all capital that may be invested in it.

PHILADELPHIA AND BALTIMORE RAILROAD.

We have before us the twelfth annual report of the Philadelphia, Wilmington and Baltimore railroad company, for the year ending Dec. 31, 1849. The receipts of 1849, compared with those of 1848, show a falling off of \$10,188. This is in part attributed to the obstruction of the Susquehanna by ice for a period of six weeks, last winter, and in part to the prevalence of the cholera last summer, which sensibly affected the business of the road. Making due allowances for these drawbacks, the general result of the operations of the year are of a satisfactory character. The receipts of the company, during the year 1849, were as follows:

From passengers	\$330,429 24
Freight and express	60,977 10
Mail rents, &c.	40,207 33
	\$431,613 58

To which add the receipts from the New Castle line 146,291 30

Total receipts \$577,904 88

The expenses were as follows:

Running expenses, &c.	\$229,165 86
Interest on loan, &c., less that accrued on new stock	124,010 33
Expenses on the New Castle line	118,773 69

\$471,949 86

Dividend Oct. 1, 1849 116,602 00

\$588,551 86

Thus leaving a net surplus of \$39,353, which, with the surplus of 1848, makes a total of \$63,644.75. The total construction expenditure during the year amounted to \$36,090 86.

It was stated in the last annual report, that during the year 1848, the capital stock of the company had been increased 350,000 dollars by the creation of 7000 shares at par. Upon each new share twenty dollars, or forty per cent, was paid in January last; of the residue, an assessment of thirty per cent, was called for on the first of April following, but by a subsequent order of the board the call was postponed until the first of October, while for the third and last assessment of thirty per cent, payment was also postponed six months, say to 1st of April, 1850. When this final instalment shall have been paid, certificates of stock to the amount of 350,000 dollars will be issued to the parties entitled to receive them.

A reference to the accounts for the years 1846 and 1849, will show that the expense of horse

power, rents, use of track, &c., in Baltimore and Philadelphia, was, for the two years, \$47,426.06, equivalent each year, at 6 per cent, to the interest upon a capital of \$395,117.16, and this is exclusive of the great injury to the cars, arising from the very rough condition of the track at all times in the streets of Philadelphia and Baltimore. The proposed change in the depot arrangements in both cities, it is believed, will save a large portion of this outlay.

A purchase has recently been made, upon very favorable terms, of the greater portion of the two squares of ground lying between Broad street and Schuylkill Seventh, and between Prime and Tidmarsh or Carpenter streets. That is to say, the entire contents of the two squares, being about 290,000 square feet; the quantity embraced in the purchase is about 230,000 square feet, the whole of it having a front on Broad or on Prime street.

The company own ground in a very desirable situation in both cities, which, when sold, it is believed will produce sufficient to cover the new purchase in Philadelphia, and the cost of the proposed buildings in both cities.

The condition of the road on the 1st January, 1850, was as follows:

Cost of road and all the appurtenances.....	\$1,944,493 16
Stock owned by the company.....	861,325 00
Real estate.....	185,718 53
Cash on hand, materials due from subscribers, &c.....	275,707 00
	\$6,267,243 69

The creditor side of the account stands as follows:

Capital stock less the stock held by the company.....	\$3,850,000 00
Mortgage loan, due 1860.....	2,161,776 05
Bonds and mortgages, guarantees, interest due, &c.....	191,822 89
Surplus.....	63,644 75
	\$6,267,243 69

Ohio.

Bellefontaine and Indiana Railroad.

A meeting of the friends of this road was held at Bellefontaine on the 23d instant, at which the Chief Engineer, W. Milner Roberts, read his report on the results of the preliminary surveys, extending from a point on the Cleveland, Columbus, and Cincinnati railroad near Galena, through Bellefontaine, to the State line of Indiana.

The report was of the most encouraging character, showing the remarkable adaptation of the country to the cheap construction of a first class railroad, with moderate grades, and consisting of a series of long, straight lines, of from five to thirty miles in length, connected by gentle curves. The average cost of preparing the road for the track is estimated at four thousand dollars per mile.

The road will be one hundred and twenty miles long, and will be an extension of the Ohio and Pennsylvania railroad, commonly called in Ohio, "the Pittsburgh Railroad," which is one hundred and eighty miles in length; the two together forming a continuous road of 300 miles, from Pittsburgh to the Indiana line. Thence to Indianapolis, the distance is eighty-three miles, of which twenty-eight miles are graded and bridged, and a large part of the remainder under way. The road is to be located immediately, and the grading and bridging put under contract. About one half required for this purpose is already subscribed.

The meeting was addressed by J. H. Godman, President of the company, and S. W. Roberts Chief Engineer of the Ohio and Pennsylvania railroad. The best spirit prevailed, and there is every indication that this link in the great Central railway of the Union is in good hands, and that it will be completed nearly simultaneously with the others.

New York.

CONTINUATION OF RAILWAY RETURNS.

Utica and Schenectady Railroad.

The length of road in operation is 78 miles. It was laid in 1847, '48, '49, with heavy rail weighing 65 lbs. per lineal yard, except about 13 miles of heavy flat rail, weighing about 45 lbs. per yard, which was previously laid. This will be taken up and replaced with heavy rail probably during 1850.

The capital stock of the company is.....\$3,560,000
Amount actually paid in is.....3,491,000

Total cost of construction, without deductions for depreciation.....\$4,006,428 02

Indebtedness:—

Bonds due, 1st June, 1851, for relaying.....\$42,500 00
" " for iron, due one half June, 1850, and the other June 1, 1851.....60,000 00

Total indebtedness.....\$102,000 00

Sums due company for iron, cars and engines.....95,553 68

Receipts from 332,961 passengers.....533,953 28

" " freight.....251,033 77

" " mails.....7,969 64

" " for interest.....15,676 46

" " from sale locomotive engines.....8,500 00

" " iron, etc.....3,108 44

" " rents.....2,700 00

" " tolls on Mohawk turnpike.....2,329 96

Total.....\$825,271 55

Disbursements:—

For heavy iron track.....\$350,777 16

" " repairs of road.....\$41,110 31

" " of buildings.....14,903 90

" " locomotives.....21,850 10

" " repairs of do.....39,232 83

" " freight cars.....7,770 60

" " repairs of do.....17,204 60

" " cars.....20,400 16

" " fuel.....28,193 75

" " taxes.....22,522 42

" " salaries and oil.....17,970 45

" " collectors.....9,616 93

" " canal tolls.....49,221 57

" " superintendents.....4,766 63

" " incidental expenses.....31,374 46

" " trans. of freight.....21,225 95

" " repairs of turnpike.....4,146 08

" " land for depots.....20,127 75

" " grading road.....30,500 83

" " fences.....1,358 19

Total expenditures 1849.....\$754,274 68

The comp'y own 4 engines and 3 machine shops, 18 locomotive engines, 200 freight cars. No miles run by passenger and other cars, 300,470. Average rate of speed of express train, about 30 miles an hour; other trains 25. Freight trains 15. Av. number men employed 450. Total dividends \$333,015 50.

Saratoga and Schenectady.

Length of road in operation, [single track] 22 miles. The road is laid in part [9 miles] with a rail weighing 56 lbs. to the yard, the residue with heavy flat bar.

The cost of construction to January 1, 1850, is.....\$386,304 25

Indebtedness of company is for loans on account of relaying, etc.....65,365 00

Receipts from 103,008 passengers.....\$24,361 29

" " freight.....10,140 22

" " mails.....495 47

" " old materials.....1,565 96

Expenses for repairs of road.....\$36,562 94

" " fuel.....9,679 59

" " repairs of engines & cars.....1,545 76

" " contingencies.....13,299 67

Total.....\$28,666 33

The company own 1 engine and 1 workshop, 2 locomotives, 2 passenger and 6 freight cars. No dividends. All the earnings of the road being appropriated to relaying the road with heavy H rail.

Long Island Railroad.

Length of road in operation (including the Brooklyn and Jamaica road, 11 miles under lease to the company) is 96 miles, and the Hempstead branch road 24—total 98½ miles.

The road was completed and opened through in 1844. Weight of rail on Brooklyn and Jamaica road, 38 lbs.; on Long Island 48 lbs. per lineal yard.

The capital stock paid in is.....\$1,781,494 46

Cost of construction.....\$2,039,406 72

" " cars.....81,434 87

" " engines, etc.....70,500 00

Total.....\$2,191,341 59

Indebtedness:—

Loans from State of N.Y. \$100,000 00

Bonds of company.....347,563 96

Accounts payable.....35,426 05

Total indebtedness.....\$482,990 01

Due company—bills receivable and accounts.....8,275 15

Receipts from 168,443 passengers.....108,823 78

" " freight.....44,881 30

" " mails.....7,610 00

Total receipts.....\$161,315 08

Amount paid for construction.....1,801 78

" " repairs of roads, cars and engines.....47,837 59

" " rents to B. and J. Co. 25,676 10

" " running expenses, etc. 74,945 06

" " interest.....26,173 45

Total.....\$176,437 00

The company own 1 machine shop and 5 engine houses, 15 locomotives, 19 passenger, 4 baggage, 142 freight and baggage cars.

The passenger trains have run 112,024 miles, freight 86,994 miles. Average number of men employed 160. No dividends.

New Jersey.

Camden and Amboy Railroad.

The commissioners appointed at the last session of the Legislature of this State, to investigate the affairs of the Camden and Amboy railroad, and Delaware and Raritan Canal companies, presented their report, comprising 272 pages of foolscap, on Friday last, the reading of which occupied the whole day, without being concluded, some 60 or 70 pages remaining to be read on Monday.

The committee have entirely exonerated the managers of the railroad and canal companies from all charges of fraud, alleged to have been committed upon the stockholders and the State. They state that omissions and mistakes have occurred, and the returns of collecting officers, in reference to the weights of goods transported on the works, by which the full amounts of transit duties due to the State have not been returned, amounting to about \$10,000; but at the same time, a large amount of merchandise carried through the canal, has been returned, over and above the actual weight of the same, chargeable with the highest rate of transit duty, which should not have been so returned. For their overpayments the companies have made no reclamation.

The report is said to be very full and able, and fully vindicates the officers and managers of the companies from the charges of fraud, perjury and mismanagement which have been brought against them.

The report states that the receipts and disbursements of the companies have been fully accounted for, but it strongly condemns the carelessness of some of the collecting officers on the canal in making their returns, though no evidence is shown of fraud or corruption on their part.

It appears, says the State Gazette, in a synopsis

of the report, that during the nine years, from 1840 to 1848, inclusive, the amount of superior merchandise transported through the canal, which was omitted by the Collector at Princeton, and for which transit duty has not been paid, was 79,888 tons. The amount of transit duty from 1834 to 1848, inclusive, was of "superior," 100,385 tons, and of "inferior," 46,533 tons.

Taking together the omissions in the returns of passengers and merchandise on the railroad and canal, prior to January 1, 1849, (after deducting \$747, paid in July, 1849, for errors discovered by the commissioners) the amount due the State is \$10,694.—*Patterson Intelligence.*

Business of the Baltimore and Ohio Railroad.

The following are memoranda of the business upon the Baltimore and Ohio railroad, for the month of January, 1850.

The transportation eastwardly into the city of Baltimore, on some of the principal staples, has been as follows:

Bark.....	5 tons.
Coal.....	6126 "
Fire brick.....	00 "
Fire wood.....	7 "
Flour.....	53,488 bls.
Grain.....	63 tons.
Granite.....	128 "
Iron.....	614 "
Iron ore and manganese.....	221 "
Lard and butter.....	150 "
Leather.....	33 "
Lime.....	0 "
Live stock, viz:	
5,228 hogs.....	412 "
41 horses and mules.....	20 "
547 horned cattle.....	306 "
Meal and shorts.....	80 "
Pork and bacon.....	612 "
Tobacco.....	107 hds.
Whiskey.....	596 bbls.
Miscellaneous.....	267 tons.

The revenue for the month has been as follows:

	Passengers.	Freight.
Main stem.....	\$24,828 82	\$66,517 89
Washington branch.....	18,009 17	3,888 97

\$42,837 99 \$70,406 86

Making a total of \$113,244 85, and showing an increase over the corresponding month of last year of \$10,679 03.—*Patriot.*

Mining.

THE CLIFF MINE.

The annual report of the Pittsburg and Boston (copper) Mining Company has been read. The amount of mineral raised from the mine during the year ending December 1, 1849, was 7,223,698 lbs. Of this 1,644,198 was of sufficient richness to ship in the condition in which it came from the mine. The residue produced 418,504 lbs. of quality similar to the other class of ore. The copper, in this condition is shipped to Pittsburgh are there smelted and refined in the furnace of the company. The whole smelting of the year has produced not less than 660 tons of refined copper. The estimated value of the operations for 1849 is \$204,576 58, after defraying the expenses of smelting and refining. The expenses of the company for 1849 were \$106,963 77. The available surplus, estimating the copper and ore on hand, and omitting from the account any of the real estate or improvements of the company, or the supplies on hand at the mine, is \$126,575 75. The directors believe that in this state of things they shall be justified in paying two semi-annual dividends the present year of \$7 each. Deducting the amount of these dividends the available surplus on hand is \$42,375 75. The total amount of the liabilities of the company is \$50,024 75—of assets, bills, and accounts receivable

\$96,670, to say nothing of the copper ore and silver on hand at the mines and in various cities, amounting to \$89,010, and of supplies and munitions for mining, valued at \$21,780. The following table gives the product of the Cliff mine in each month of the year ending Dec. 1, 1849:—

	bbl ore.	Masses	Stamp	Total
	50 p. ct.	70 p. ct.	5 p. ct.	lbs.
December, '48.....	50,007	55,354	571,500	678,861
January, 1849.....	40,756	73,159	514,500	628,415
February, ".....	20,685	79,405	529,500	629,509
March, ".....	22,864	48,669	583,500	655,033
April, ".....	21,298	43,692	338,500	453,490
May, ".....	90,129	99,600	224,500	614,229
June, ".....	88,562	92,874	325,500	506,936
July, ".....	57,932	93,385	399,000	550,317
August, ".....	55,082	236,237	504,000	795,319
September, ".....	50,303	88,401	396,000	534,704
October, ".....	41,371	103,081	480,000	624,452
November, ".....	27,325	64,027	468,000	559,352

556,314 1077,884 5584,500 7223,688

Last year the Boston and Pittsburg Company paid a dividend of \$10 per share.

Of the prospects of the company, the directors say:—

"The lode continues to maintain the same favorable vertical position noticed in our last report:—and its mineral bearing character remains unchanged. Of its permanency and future productiveness, after the developments already made, no well-grounded apprehension can be entertained.

As it will be expected of the directors to make some suggestions and calculations touching the probable product of the present year, they propose in brief, to say this: that no information in their possession would justify the conclusion that the probable results of the present year will be less satisfactory than those of the last. On the contrary they regard the capacity of the mine for yielding the mineral as greater than at any previous period; that part of the mine, especially, lying south of the main shaft, and which, in all the levels above the number five was comparatively unproductive, has in that level become the richest part of the lode.—Should the mine continue 'to make' in that direction, as it doubtless will in the level now about being opened, the capacity of the mine will in a short time be very greatly enlarged."

Pacific Railway.

The people of St. Louis have fairly broken ground in favor of this project. A meeting of the gentlemen named as directors in "an act to incorporate the Pacific railroad," was held in the office of the St. Louis Insurance Co., in the city of St. Louis, on Thursday evening, the 31st of January, at which were present John O'Fallon, James H. Lucas, Edward Walsh, Geo. Collier, Daniel D. Page, James E. Yeatman, Joshua B. Brant, Thos. Allen, Adolphus Meir, Adam L. Mills, and Wayman Crow, named as the incorporators by the charter.

Mr. Allen submitted an elaborate report in favor of the proposed road, demonstrating its utility, probable profits, and the necessity of its early commencement and energetic prosecution to a consummation.

On motion of Mr. Lucas, it was resolved, that the incorporators do now proceed to organize, by the election of a president, secretary and treasurer.

The vote having been taken, resulted in the election of Col. John O'Fallon, president; Thos. Allen, secretary; and Daniel D. Page, treasurer.

On motion of Mr. Allen, it was Resolved, That a committee of three corporators be appointed to open books for subscription to the capital stock of the company; that said books be opened on Monday, the 4th day of February, at 10 o'clock, and closed at 3 o'clock, P. M., and kept open for six days, in the rooms of the Merchants' Exchange.

On motion of Mr. Allen, it was Resolved, That a committee of three be appointed to prepare a memorial to Congress, praying a donation of alternate sections of land along the route for the construction of the proposed road.

The following gentlemen, members of the board of directors, pledged themselves upon the opening of the books, to subscribe the following amounts of stock:

John O'Fallon.....	\$33 400
James H. Lucas.....	33 300
Daniel D. Page.....	33 300
Thomas Allen.....	10 000
J. & E. Walsh.....	10 000
J. E. Yeatman.....	5 000
J. B. Brant.....	10 000
Geo. Collier.....	10 000
Wayman Crow.....	2 500
A. L. Mills.....	5 000
Adolphus Meir.....	1 500

This is going the right way to work. Let them but once commence, and means never will be wanting for its continued prosecution. The surest way to obtain aid from Congress in favor of the scheme is to present to the public a work in progress. In such case, government may properly be appealed to for aid, though it should turn out that the work as a whole is impracticable.

New York.

Harlem Railroad.—The following is the general account of the Harlem railroad, as condensed from their books on the 31st December, 1849.

Capital stock, old.....\$2,388 750 00
preferred.....1,407,780 00

Total stock.....3,796 530 00
Bonds outstanding.....525,448 09
Story, Mills & Co.....10,278 92
Unpaid dividends.....1,076 49
Profit and loss.....116,030 73

4,449 364 23

Railroad.....\$4,014,668 43
Equipment,—(value per inventory,
\$238,654 33.....230 891 92
Materials on hand.....39,202 35
Real estate.....109,613 67
Less mortgages.....60,242 00

49,371 67
Albany extension.....6,239 32
Outstanding accounts, balance.....29,089 32
Cash on hand.....87,910 42

\$4,449,864 23

The general bond account has been reduced \$4,912 during the year. The real estate bond account has increased \$4,000, for lots on the corner of 33d street and Fourth avenue. No real estate has been sold during the year, or any money borrowed on real estate.

Vermont.

Vermont Valley Railroad.—We learn that the Messrs. Schuyler of this city have taken the contract for building the Valley railroad between Belows Falls and Brattleboro', at \$800,000 for the whole route, land damages excepted.

Connecticut.

Troy and Greenfield Railroad.—At the annual meeting of the stockholders of this road, held last week, the following persons were chosen directors: Geo. Grennell, Daniel Wells, S. H. Reed, Cephas Root, E. G. Lamson, John Porter, Josiah Ballard, Erastus Rice, Jenks Kimball, L. C. Thayer, E. S. Hawks, S. V. R. Hoxie, Levi Smeadly. Almon Brainard was chosen treasurer. It was voted to receive any materials for subscriptions, that could be used in the construction of the road. The directors presented a report, from which it appears that the whole amount of stock subscribed was \$231,000 00. The meeting was addressed by Alvan Crocker, Esq., A. F. Edwards engineer, and others.

AMERICAN RAILROAD JOURNAL.

Saturday, February 16, 1850.

Subscribers who wish for back numbers to complete their volumes are requested to send for them at once.

The Hague Street Explosion.

We give to-day copious extracts from the testimony taken before the coroner's inquest, held in reference to the terrific explosion which occurred in this city on the 4th inst. The only points established are to be found in the verdict of the jury. There seems to be no question that the boiler was faulty of construction, and the explosion was the result of the most wanton carelessness and selfishness.

As to the cause of the explosion, whether from simple pressure of steam, or from other causes, but little light was thrown. Almost every witness examined, of whom there were a great number, had his own theory in the matter; hardly any two agreeing upon a point. That simple pressure should produce such an explosion, acting equally upon the strong as well as the weak points of the boiler, is hardly credible. Would air forced into a boiler, beyond its capacity to resist the pressure, produce similar results? If not, then an undue pressure of steam could not. It would burst the boiler not explode it. It would act simply upon the weak point, leaving the strong unaffected.

The formation of an explosive gas under high degrees of heat, is a theory which is maintained by many to account for the phenomenon of explosion without any particular reason for than the necessity of some adequate cause. This theory thus far rests upon conjecture.

From experiment, it is a well ascertained fact, that in the production of steam in the boiler, electricity is generated very rapidly. It is also well known that vapor in the form of clouds, either develops or attracts electricity, and when collected in large quantities, passes off in the form of lightning, which is simply an effort of nature to maintain an equilibrium.

When steam is at a high pressure, on lifting the safety valve in the dark, a current of electricity may be seen passing from the current of steam to the valve. May it not be the case that under certain conditions, electricity is generated by the production of steam to such an extent as to exhibit similar phenomenon, which we witness in the thunder cloud? By this theory, the fact which now seems well settled that in high pressure of steam, an explosion is more liable to take place is easily accounted for. The large amount of electricity being collected and held by the steam in the boiler has a tendency to pass off in volume. When a motion is given to this steam a momentum is communicated to the electricity residing in it. It is thus accumulated in mass upon a given point, in successful force, to pass off in the form of a thunder bolt, and thus cause an explosion. That such a theory agrees with the fact is demonstrable. The only question is whether electricity can exist in sufficient intensity to produce the results here attributed to it.

These views are thrown out rather by way of suggestions than as affording an explanation of the explosion. It is to be hoped that this disastrous affair will turn the attention of scientific men to this subject, and that it may lead to the discovery of the law or principle by which such terrible accidents are caused.

Massachusetts.

The Vermont and Massachusetts railroad company have just issued their annual report. The total cost of the road and equipment is stated at \$2,934,917 68. Its funded debt is \$877,675—floating debt \$108,014 32. To offset the latter are assets amounting to \$91,732 20. The nominal capital of the concern is not given. The gross receipts of the year were \$145,117 69, expenses \$80,693 91, net profits, \$64,153 78; or sufficient to pay the interest on the bonds and leave an excess of \$11,283 29, which is rather more than one-third of one per cent. on the cost of the road. The remaining three miles of the Greenfield branch are now under contract, and when completed will carry the total cost of the concern to \$3,200,000. To pay six per cent. on this amount will require an annual receipt of \$384,000, at least, and to make the concern a good six per cent. stock at cost, the receipts should be ten or fifteen thousand more. The prospects of the road are considered favorable by the directors.—When the Greenfield branch, the Greenfield and Troy road, and the Vermont Valley road are all finished, the business of the Vermont and Massachusetts must be largely increased.

Western Railroad.—The stockholders of this road had a quiet meeting yesterday, for the choice of directors, and Messrs. Addison Gilmore and Josiah Stickney of Boston, Robert Campbell of Pittsfield, Chester W. Chapin of Springfield, and John Gardner of Dedham, were nearly unanimously elected. The directors' annual report was read and accepted.

We copy the following article from the Maysville Herald, to which we invite the special attention of our farming friends:

Advantage of Railroad transportation of Live Stock.—An intelligent practical farmer from Clark county, Kentucky, recently gave us the following facts as illustrative of the vast importance of railroads to the agricultural interests of Kentucky.

He was in Cincinnati at a packing house during the slaughtering season, and his attention being attracted by the excellent condition of a lot of hogs, then being cut up in his presence, he remarked to the owner that he must have fattened them very near the city, as they had nothing of the feverish and mottled appearance of hogs driven from a distance. The answer elicited the fact that they had been shipped the morning before at 8 o'clock in a railroad car alive, 84 miles from the city, and delivered in Cincinnati, slaughtered, cut and barreled before 10 the next morning, and the farmer ready to go home by the evening train. The whole cost of transportation was 14 cents a head for the hogs, numbering 160. Upon inquiry, he found that hogs of the same weight, driven from Kentucky a similar distance, lost 14 pounds in gut fat when compared to the lot referred to, and admitting that all came safely to market (a rare occurrence) the cost of driving and loss of weight, made a difference in favor of the Ohio farmer of \$1 25 a head, or \$244 44 cts., upon 194 hogs of the weight of those referred to.

Our informant then went into a calculation showing conclusively, that to the farmers living in a circuit of sixty miles around a central depot, for the interior and stock growing counties of the State would save by railroad transportation alone (over driving) a million and a quarter of dollars in ten years—equal to the cost of constructing the road from the point designated to the Ohio river.

Let those interested ponder on these things; as such facts are worth all the speculation and theory that would be contained in a quarto volume.

We gave some time since in our paper the plan of P. P. F. Degrand, Esq., of Boston, for a railway to the Pacific. By his scheme a private company is to undertake the work, and is first to subscribe and pay into their own treasury \$2,000,000. The general government is then to loan its credit to said company to the amount of \$98,000,000, the whole being estimated to cost \$100,000,000; the \$2,000,-

000 furnished by the company being considered mainly in the light of a pledge given by them for the proper expenditure of the \$98,000,000. This is the manner in which the ways and means are to be provided, and if they are furnished, Mr. Degrand assures us that the road from St. Louis to San Francisco can be completed in less than five years.

As to that part of the plan for obtaining the money for building the road, we felt satisfied in the outset: that Congress never would and never should loan so large a sum to any individuals or companies for any object. The idea that Congress would make such a loan indicates a total want of appreciation of the popular feeling not only in this body but throughout the country. Such a thing is not within the bounds of remote possibility. The idea that with this sum of money the road could be constructed in five years is equally absurd. So wild a proposition is full proof of the unfitness of those making it to undertake the work. If judgment so errs in one case it certainly will in another. It would take half of five years to make the surveys. Two and a half years are left in which to build the road; at the rate of 1000 miles per year; almost the entire line being through an unsettled country, the greater part without timber, and much of it sterile wastes, without even wood or water.—

We have, as has everybody who knows him, the greatest regard for the author of this scheme. But we always considered it as the offspring of a lively imagination, originating with and confined to himself. On that account we have said but little in relation to it, except briefly to disprove of it.—But either we have entirely miscalculated its popularity in New England, or Mr. Degrand has the largest number of kind hearted friends of any man within our acquaintance. The petition in aid of his plan, embraces all the authority in Massachusetts in railway matters, with a host of other great names. Now Mr. Degrand must pardon us if we still profess to believe, that the signing his petition is a tribute to his own estimable qualities, and an expression of good will, rather than any approbation of his scheme. But while all others are incredulous, Mr. Degrand is by no means idle.—He has already accomplished what we assigned to years to effect. He has presented to the public a complete profile and map of his route, for a copy of which we are indebted to him. Nothing more remains to be done but to get the money, roll up sleeves and go to work. The map and profile are accompanied with a description of the route prepared by W. L. Dearborn, Civil Engineer. As a knowledge of the physical features of the route proposed are of the highest interest, we give the following extracts from the description, presuming that "no other paper has the news."

GENERAL DESCRIPTION OF ROUTE.

P. P. F. DEGRAND, Esq.

Boston, Nov. 16, 1849.

Dear Sir—I herewith transmit the result of the investigation, which I promised you I would make, in relation to a railroad route, for connecting the Mississippi river and the Pacific Ocean, which I beg you to accept, with a most ardent desire for, and a full belief in seeing it soon opened for travel.

From the Kansas river to the South Pass of the Rocky Mountains, a distance of 952 miles is a gradually ascending plain, with an average rise of a little more than 7 feet per mile, and for a line of equal length, I know no part of the world where one could be traced (except perhaps over the Pampas of South America, the Steppes of Russia, or the Plateaux of Central Asia) whose physical features would compare with it in regularity.

From the South Pass to the Sierra Nevada, 709 miles by the red line route, are points, on from 100 to 200 miles of it, which present obstacles to be overcome, as difficult, but not I think more so than on some portions of the Western railroad of Massachusetts. The remaining 569 miles are very level, and well adapted to the easy construction of a railroad.

Humboldt river and Bear river mountains are flanked and their summits avoided by the red line route, from the South Pass to Humboldt's river, called Sublette's Cut-off, and the distance thereby decreased so much, as to render it shorter, by a hundred miles, than an other line of travel.

The perfect practicability of the route, from St. Louis to the Sierra Nevada, may be considered as well established, and the obstacle which that mountain range seems to present, is not by any means to be considered as insurmountable.

The ease with which difficult summits are overcome by simply drawing a red line, is worthy of all admiration, and deserving the attention of all engineers as the latest discovery in engineering science.

We are next treated by the same author with a description of the agricultural capabilities and the climate of the region, as follows:

From St. Louis to the Kansas river is a very fertile district, with an abundance of timber; and from the last named point to the head waters of the Little Blue river, 275 miles, the soil cannot be surpassed in the United States, as is indicated by the forest trees and native flora. So beautiful was it considered by Bryant, that he calls it "*the future Eden of America*." By referring to the map it will be seen that it is traversed by numerous streams and rivers, some of which have good mill sites upon them.

The immense plain, situated between the Platte or Nebraska river on the north, the Arkansas river on the south, the Black Hills on the west, and the Kansas river on the east—embracing several degrees of latitude and longitude—has a good soil, and is capable of supporting a large agricultural population. The trees are here generally confined to the valleys of the streams; but there would be no difficulty in covering tracts of any extent with forest trees; and with much less labor than has been expended in planting the moors of England and Scotland by gentlemen owning them; and this too for profit, and the result has more than equalled their expectation, in the sale of the timber obtained for mechanical purposes.

The Nebraska or Platte river is studded with beautiful islands, and some of them are of great extent—as Grand Island, which is 22 miles long with an average width of about two miles. It has a rich soil, and is well wooded. This point has been designated, by an officer of engineers, as a favorable site for a military post.

From Laramie river to the eastern edge of the Great Basin, there are some sterile spots; but this is compensated for by many excellent tracts of land, even among the mountains.

The large valley of Bear river, north of the great Salt Lake, is of surpassing beauty and fertility, as are portions of the valleys of the north Platte and Sweet Water rivers, besides several others, of less extent. These mountains and valleys are capable of supplying an immense quantity of timber.

The Great Basin, which extends west from the Rocky Mountains to the Sierra Nevada, in a succession of mountains and plains, having a system of rivers and lakes of its own—the plains are generally sandy and sterile, but the mountains are bordered by rich beds of alluvium, and some of the valleys, particularly that near Utah Lake, on which the New Jerusalem of the Mormons has been located, and that of Humboldt river, are exceedingly rich in soil. The latter is about 300 miles long, and the river is bordered by trees; but the wood is principally confined to the mountains.

The slopes of the Sierra Nevada present many desirable localities for the agriculturist, and the valleys of the Sacramento and San Joaquin rivers, and the territory surrounding the Bay of San Francisco and extending far north and south of it, are capable of growing many of the tropical trees, fruits and plants. Upper California is the only

portion of North America where the choicest varieties of edible and wine grapes have been, as yet, successfully cultivated. Several varieties of forest trees are to be found here, which attain an enormous size.

In conclusion, I may safely say, that the route passes through a far better tract of country than that of Massachusetts, taken as a whole.

The climate, from the Mississippi river to the Pacific ocean, is much milder than the same latitude east of the Alleghany Mountains; and that of the Great Basin, Sierra Nevada and Rocky Mountains are much less severe than could be expected, from their great elevation—and is not more rigorous than that of the valleys of the Kennebec and Penobscot rivers in Maine, or the upper portions of the Connecticut and Hudson.

The gravity with which this immense amount of nothing is said is really the height of the ludicrous. The philosopher in the happy valley of Rasselas who directed and regulated the movement of the celestial bodies, could not feel greater self complacency than does this wonderful engineer, who avoids a disagreeable summit by drawing a red line, and who, sitting in a good easy chair in Boston, projects with a dash of his pencil a profile of the country from St. Louis to San Francisco. Let Mr. Degrand take but one step more and his success is complete. Let him place upon his imaginary track two trains of cars, one loaded with the products of the Mississippi valley, and the other with the silks and spices of China and India, and an imagination vigorous as his his own, will give these symbols real life, and his great and cherished object will to him be fully realised.

The pertinacity with which this scheme is thrust, before the public is our only apology for again noticing it. We have never pretended to argue the question of its merits, upon the simple ground "that what is not reasoned up cannot be reasoned down." The whole scheme is a creature of the imagination—and we have neither time nor disposition to combat the fancies of men, as this can only appropriately be done by arguments drawn from a similar source.

Cast Iron Rail for Railroads.

The limit of permanent elasticity is greater in cast iron than in wrought; but while the breaking-point is nearer to this limit in cast iron than in wrought iron, there is on the other hand, no doubt that every strain beyond this limit, while breaking the one 'deteriorates' the other. Straining a rail beyond the limit of permanent elasticity unfits it for use before one quarter of its term of duration under the proper limits of its wear—those of friction alone; and consequently, the limit of permanent elasticity being higher in a cast than in a wrought rail, the cast rail is the rail of *ultimate economy*. Besides, cast iron is injured less by the weather than wrought iron.

The strength of a rail increases in the proportion of the square of its depth—a rail of three inches deep being two-and-a-quarter times the strength of a similar rail of two inches deep. Now the upper and the lower web of a rail being necessarily of the same width in any case, an increase of weight in the rail must go for the greater part to increase its depth; and, therefore, an increase of weight must give a much higher proportion of increase to the strength. The strength of cast iron is 1-9th less than that of wrought iron; while, on the other hand, it is only 2-3ds of the cost; therefore for the same price a rail of cast iron may be made much stronger than a wrought rail.

Cast iron rails have never been tried on continuous bearings. On intermediate bearings they have been found faulty on only the ground of the liability

to dangerous accidents consequent on their brittleness. On continuous bearings there can be such liability; a break across the rail will not be more dangerous on continuous bearings than any of the joints of the rail. Besides, cast iron resists compression much better than wrought iron; and the strain with continuous bearings being chiefly compressive, the liability to such cracks is reduced to little or nothing. Furthermore, the cast rail being made in say six feet lengths, the allowance for expansion and contraction is reduced to about one-thirtieth of an inch; consequently the joints being almost perfectly close, and the surfaces being fixed easily together by flanges at the ends or otherwise, the cause of breakage—the percussions arising from bad joints—may be completely removed.

The facility with which the cast rail may be made to any form necessary for strength gives it some advantages over wrought. The hollow form is much the strongest with same quantity of metal; but as the strain on the rail as on any other bearer is of two sorts, being above the 'neutral axis' compressive and below that axle tensile, it will be found judicious to chill the top of the rail to some considerable depth, and besides casting the remainder without chill to run the lower web to the height of the neutral axis within the core. The ends of each casting to be provided with flanges bolted firmly within one-thirtieth of an inch of each other, to hold the surfaces of the rail perfectly even. The very small space left between the ends for the purpose of expansion and contraction will, while the line is made perfectly continuous and smooth throughout its whole length, by admitting a little play between the castings have the effect of adapting the rails to any inequality consequent on a depression of a particular bearing. With such a rail as this laid on a continuous bearing of timber perfectly free from knots, (these being where they occur removed) there seems to be very little likelihood of cracks from the brittleness of the metal; and should such cracks be found to occur there is not even a remote likelihood of accident on that account, seeing that the rail, though broken across yet being held in its position by bolts along its length must yield almost as effective a support to the wheel as it did before the breakage.

Experience may justify a less weight of metal in the cast rail; but in consideration of the prejudices against it, I would recommend that in the beginning it be proportioned fully to the cost of the rail intended to be used. One and a half the weight of the wrought rail may be considered generally as equalising the cost; but in the interior of the country the wrought rail is so much more expensive, the weight of the cast rail had better perhaps be reduced below this standard.

The introduction of a cast rail, bringing work to door of every furnace within the district influenced by a railway, will foster the iron trade of the country by an outlay for rails alone of several millions of dollars per annum. By enabling every furnace on the route of a railroad to manufacture them from ores on the spot, the adoption of a cast iron will reduce the price of rails in the first instance by at all events the expense of carriage from the seaboard; and after a time by giving the iron trade a good start effect a great reduction in the expense of producing the rails.

On these grounds I feel anxiety as to the result of a practical test in this case. The only danger to be apprehended lies in the joints; by making these strong and even the rail must almost certainly prove

itself superior to the wrought rail both in duration, ease of motion, economy of plant and of motive power. No prejudices should affect this case: a cast iron rail on longitudinal bearings has never been tried; and at the worst is a perfectly open question of great importance to the railroad and iron interests of the country. Abstract reasoning goes to show its superiority to the fullest extent short of absolute experience. M.B.H.

Ogden & Martin's ROSENDALE CEMENT.

WE are prepared to enter into arrangements for supplying our Cement for public works or other purposes. We warrant the cement equal in every respect to any manufactured in this country. It attains a great degree of hardness, sets immediately under water, and is a superior article for masonry coming in contact with water, or requiring great strength.

For sale in tight barrels, well papered, at their office by
OGDEN & MARTIN, 104 Wall st.
February 16, 1850. ly*

The above cement is used in most of the fortifications building by government.

Railroad Iron Wanted.

VIRGINIA AND TENNESSEE R.R. OFFICE,
Lynchburg, January 25, 1850.

PROPOSALS will be received at this office, until the 1st of March next, for the delivery in Lynchburg, of iron rails for the Virginia and Tennessee Railroad, to be manufactured in or near this town, of Virginia Iron.

The said iron to be made of the best pig metal, and to be delivered at the following times and in the following quantities, viz: six thousand tons in the year 1851, and the remainder (about 15,000 tons) for the whole road, equally in the years 1852 and 1853.

Separate proposals will also be received for the delivery in Lynchburg, of pig metal, at times and in quantities sufficient for the manufacture of the rails above mentioned, said delivery to commence as early as the 1st of November, 1850.

The rails and pig metal will be subjected to strict inspection—the rails are to weigh about 60 lbs per yard.

At the same time proposals will be received for the above quantity of iron, manufactured any where else in America, or in England, to be delivered in Lynchburg or Richmond, under the same general conditions as those prescribed for Virginia Iron, manufactured at Lynchburg. Satisfactory security will be required.

By order of the Board of Directors.

CHAS. F. M. GARNETT,
Chief Engineer.

NOTICE TO

Superintendents of Railroads.

TYLER'S PATENT SAFETY SWITCH.—The undersigned would respectfully call their attention to his Patent Safety Switch, which from long trial and late severe tests has proved itself perfectly reliable for the purpose for which it was intended. It is designed to prevent the train from running off when the switch is set to the wrong track by design or accident. The single rail or gate switch is established as the best and safest switch for the ordinary purpose of shifting cars from one track to another, but it is liable to the serious evil of having one track open or broken when connected with the other. My improvement entirely removes this evil, and while it accomplishes this important office, leaves the switch in its original simplicity and perfection of a plain unbroken rail, connecting one track with the other ready for use.

The following decision of the Commissioner of Patents is respectfully submitted to Railroad Engineers, Superintendents, and all others interested in the subject.

(COPY.)

UNITED STATES PATENT OFFICE,
Washington City, D.C., April 28th, 1846.

Sir: You are hereby informed that in the case of the interference between your claims and those of Gustavus A. Nicolls, for improvements in safety switches—upon which a hearing was appointed to take place on the 3d Monday in March, 1846, the question of priority of invention has been decided in your favor. Inclosed is a copy of the decision. The testimony in the case is now open to the inspection of those concerned.

Yours respectfully,
EDMUND BURKE,
Commissioner of Patents.

To Philip B. Tyler.

Any further information may be obtained by addressing P. B. TYLER, Springfield, Mass., or JOHN PENDLETON, Agent, 149 Hudson St., New York.

3,000 Tons Railroad Iron.

THE UNDERSIGNED IS PREPARED TO contract for the delivery of the above quantity at any port of the United States. Can be made of any required pattern and of a favorite brand.

CHARLES ILLIUS,
20 Beaver St., New York.

Brown's Old Established SCALE WARE HOUSE, NO. 234 WATER ST., NEW YORK.

THE Subscriber, Practical Manufacturer of Scales of every description, respectfully asks the attention of Railroad Companies to his Improved Wrought Iron Railroad Track and Depot Scales which for strength, durability, accuracy, convenience in weighing, and beauty of workmanship, are not surpassed by any others in this country.

He is aware that this is rather a bold assertion for him to make, yet he can say with confidence that they have but to be tried to give them precedence over all others.

J. L. BROWN.

Bank Scales made to order, and all Scales of his make Warranted in every particular.

References given if required.

4tf

BALL & CO'S PATENT Indestructible Water Pipe.

We publish below the opinions of others who have a personal knowledge of our Pipe, and would request all persons interested in the conveyance of water to investigate its merits for themselves. It being cheaper than Cast iron pipes, and incomparably more durable (as there is no chance to commence decay but continually grows more permanent) it must supersede it altogether in works requiring durability and purity.—Branching, taping, altering or relaying, is done with the greatest facility, and certainly, without injury, in any size of bore from 3 feet diameter down to 1/4 of an inch under any head that can be controlled with hose or service pipes.

J. BALL & CO.

Corner of Read and Centre Sts., N. Y.

FOR the benefit of those who have requested information in regard to this excellent article, we insert the following testimonials in relation to its merits: "In answer to the numerous inquiries in relation to J. Ball & Co's Indestructible Water Pipe, composed of iron and cement and in use in our village, the undersigned, water commissioners, trustees, and late trustees of the village of Saratoga Springs, take this method of saying that we have perfect confidence in the utility, goodness and durability of said pipe. The village of Saratoga Springs has some 20,000 feet of this pipe, varying from 6 1/2 to 1 1/2 in. in diameter, under a head of about 80 feet. It has been laid since the fall of 1846. Since it was fully completed, it has cost comparatively nothing to keep it in repair; and, although some portions are exposed to the frost, it seems to stand well the test, and answer all the purposes for which it was designed and constructed. We believe it preferable to iron pipe—is much cheaper and more durable, and we would not exchange it for any other kind of pipe yet invented, if we could without any additional expense or inconvenience. The water comes through clear and pure, and where we have had occasion to take any part of it up to improve or alter the grounds, it appeared to be just as sound and imperishable as the moment it was laid down. This testimony is entirely disinterested, and is now given to avoid the necessity of answering the many calls upon us for information on this subject. We have witnessed and many of us have superintended the laying down of the pipe in this village, and watched its operations since, and are perfectly satisfied that we have the best water pipe ever presented to the public. Saratoga Springs, Dec., '49.

G. M. Davidson,	} Water Com.
R. Putnam,	
N. B. Doe,	} Trustees.
R. Gardner,	
H. P. Hyde,	} Late Trustees.
J. L. Perry,	
J. D. Briggs,	} Late Trustees.
S. Chapman,	
J. A. Corey,	
W. M. Alger,	
S. Cook,	

"I certify that I was Chief Engineer, having the construction of the above work in charge, and fully concur in the foregoing statement. Dec., 1849.

"S. R. OSTRANDER, Civil Engineer."

A card, signed by the Trustees or Water Commissioners of Saratoga Spa (village), expressing their unqualified approval of J. Ball & Co's indestructible water pipe, has been shown me; whilst I fully endorse from my own experience, the statements of these gen-

lemen, I am enabled to add that under my direction, some six thousand feet of cement pipe was laid by Messrs. Ball & Co., in this village; that the main pipe was of 10, 4 and 6 inches bore, and is subjected to a pressure due to an average head of sixty-five feet—it has fully answered my expectations. I would further state that, having been employed by the Common Council of Albany to report a plan of supplying that city with water, I had occasion very carefully to test the merits of this kind of pipe, and was so fully convinced of the practicability of using the cement pipe for large conduits, being of three feet in diameter, as well as for smaller ones, that I recommended its adoption in the proposed work, and give my reasons for so doing.

1st. That the cement pipe is far less expensive than that of cast iron or brick.

2d. That it will sustain an equal pressure with that of cast iron; and when used for large conduits, can be carried up and down the inequalities of the surface of the ground, saving the grading, which is indispensable if a brick one is used.

3d. That it can be readily and economically repaired, and, should it become necessary, can be taken up and relaid without injuring the pipe.

4th. That this description of pipe is not so much affected by frost as one of metal, and in no way impairs the quality of the water.

F. S. CLAXTON,

Engineer and Ag't Cohoes Co.

Messrs. J. Ball & Co., New York.

Cohoes, December 31, 1849.

In addition to the above testimonials, we can state that, having had experience and personal knowledge in regard to the excellent qualities and durability of the above pipe, we have no hesitation in recommending it to the public.

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Messrs. J. Ball & Co.:

Gents.: Articles have appeared in the Farmer and Mechanic, from Saratoga and Cohoes, on the subject of your water pipes; I fully endorse their opinions. Your work for my son's water cure at South Orange, embracing a large amount of four and three inch pipe, under a head at least as great as the Croton of New York, shows not only certainty and efficiency, but what is equally important, perfect purity, which for medical purposes is all important, and should be considered so for drinking and other uses.

Yours, SAML. MEEKER.

Newark, January 11, 1850.

In addition to the above, we certify that J. Ball & Co. have inserted pipes for us of 10 inch bore and less, since the winter of 1844, and that last Spring we had over 1000 lbs. of lead pipe removed, and its place supplied with their pipe. We fully endorse the opinions expressed in the notices above.

BEACH, BROTHERS,

New York Sun Establishment.

Having for the past three years laid many of Messrs J. Ball & Co's patent cement pipes in the Newark Aqueduct Co., I prefer them to any pipe that I have used, their cost being one-third less than iron pipe, and also being free from wear and rust; and can most cordially recommend them for all aqueduct purposes.

SHELDON SMITH, Superintendent.

Newark, January 14, 1850.

THE NEWCASTLE MANUFACTURING Co. continue to furnish at the Works, situated in the town of Newcastle, Del., Locomotive and other steam engines, Jack Screws, Wrought Iron Work and Brass and Iron Castings, of all kinds connected with Steamboats, Railroads, etc.; Mill Gearing of every description; Cast Wheels (chilled) of any pattern and size, with Axles fitted, also with wrought tires, Springs, Boxes and bolts for Cars; Driving and other wheels for Locomotives.

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STEPHEN H. LONG, Patentee.

Louisville, December 10, 1849

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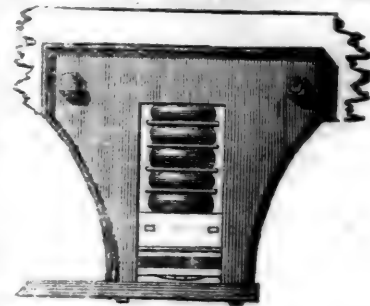
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Chief Engineer Croton Aqueduct, New York.

Cop Waste.**CLEAN COP WASTE**, suitable for cleaning Rail-
road, Steam boat and Stationary Engines, con-
stantly on hand and for sale by**KENNEDY & GELSTON,**
54 Pine St., New York.

October 27, 1849,

3m

IRON.**Iron.****Pig Iron**, Anthracite and Charcoal; Boiler and Flue
Iron, Spring and Blistered Steel, Nail Rods, Best Re-
fined Bar Iron, Railroad Iron, Car Axles, Nails, Stove
Castings, Cast Iron Pipes of all sizes, Railway Chairs
of approved patterns for sale by**COLEMAN, KELTON & CAMBELL,**
109 N. Water St., Philadelphia.**IRONDALE PIG METAL, MANUFACTURED**for sale by the Bloomsburg Railroad Iron Co.
DUDLEY FISHER, Treasurer.
75 N. Water St., Philadelphia.**Railroad Iron.****500** Tons, afloat, weighing 57 pounds per lineal
yard, for sale by**COLLINS, VOSE & CO.,**
158 South St.
New York, November 17, 1849. 1m46**Railroad Iron.****THE** Undersigned, Agents for Manufacturers, are
prepared to contract to deliver Rails of superior
quality, and of any size or pattern, to any ports of dis-
charge in the United States.**COLLINS, VOSE & CO.,**
158 South St.

New York, November 17, 1849.

Railroad Iron.**1600** Tons, weighing 60 lbs. per yard.
185 " " 57 " "
580 " " 53 " "of the latest and most approved patterns. For sale by
BOORMAN, JOHNSTON & CO.,
119 Greenwich street.

New York, Oct. 13, 1849.

Railroad Iron.**THE** Undersigned have on hand, ready for immedi-
ate delivery, various patterns of Iron Rails, of
best English make, and manufactured in conformity
with special specifications.They offer also to import and contract to deliver
ahead—on favorable terms.**DAVIS, BROOKS, & CO.,**
68 Broad street.

New York, Oct. 11, 1849.

Drawings and Patterns of the most approved
Rail—and specifications of quality and make of same,
are on hand at their office, for examination of parties
who may desire to inspect the same. **D., B. & Co.**
Oct. 11, 1849.**CUT NAILS OF BEST QUALITY, BAR IRON**
(including Flat Rails) manufactured and for sale
by **FISHER, MORGAN & CO.,**
75 N. Water St., Philadelphia.**Glendon Refined Iron.**Round Iron, Band Iron, Hoop Iron,
Square " Flat " Scroll "Axles, Locomotive Tyres,
Manufactured at the Glendon Mills, East Boston, for
sale by **GEORGE GARDNER & CO.,**
5 Liberty Square, Boston, Mass.

Sept. 15, 1849. 3m37

**PATENT HAMMERED RAILROAD, SHIP &
BOAT SPIKES.**—The Albany Iron Works
have always on hand, of their own manufacture, a
large assortment of Railroad, Ship and Boat Spikes
from 2 to 12 inches in length, and of any form of head;
From the excellence of the material always used in
their manufacture, and their very general use for rail-
roads and other purposes in this country, the manu-
facturers have no hesitation in warranting them fully
equal to the best spikes in market, both as to quality
and appearance. All orders addressed to the subscrib-
ers at the works will be promptly executed.**JOHN F. WINSLOW, Agent.**Albany Iron and Nail Works, Troy, N. Y.
The above Spikes may be had at factory prices, of
Erastus Corning & Co Albany; Merrill & Co., New
York; E. Pratt & Br. & Co., Baltimore Md**LAP—WELDED
WROUGHT IRON TUBES**

FOR

**TUBULAR BOILERS,
FROM 11-2 TO 8 INCHES DIAMETER.**These are the **ONLY** Tubes of the same quality
and manufacture as those so extensively used in
England, Scotland, France and Germany, for Lo-
comotive, Marine and other Steam Engine Boilers**THOMAS PROSSER,**

Patentee.

28 Platt street, New York

Railroad Iron.**THE UNDERSIGNED ARE PREPARED TO**
contract for the delivery of English Railroad Iron
of favorite brands, during the Spring. They also re-
ceive orders for the importation of Pig, Bar, Sheet, etc.
Iron.**THOMAS B. SANDS & CO.,**22 South William street,
New York.

February 3, 1849.

Iron Store.**THE** Subscribers, having the selling agency of the
following named Rolling Mills, viz: Norristown,
Rough and Ready, Kensington, Triadelphia, Pott-
grove and Thornedale, can supply Railroad Companies,
Merchants and others, at the wholesale mill prices for
bars of all sizes, sheets cut to order as large as 68 in.
diameter; Railroad Iron, domestic and foreign; Loco-
motive tire welded to given size; Chairs and Spikes;
Iron for shafting, locomotive and general machine;
purposes; Cast, Shear, Blister and Spring Steel; Boil-
er rivets; Copper; Pig Iron, etc., etc.**MORRIS, JONES & CO.,**

Iron Merchants,

Schuylkill 7th and Market Sts., Philadelphia.
August 16, 1849. 1y33**Railroad Iron.****THE MOUNT SAVAGE IRON WORKS**, AL-
legany county, Maryland, having recently pass-
ed into the hands of new proprietors, are now prepar-
ed, with increased facilities, to execute orders for any
of the various patterns of Railroad Iron. Communi-
cations addressed to either of the subscribers will have
prompt attention. **J. F. WINSLOW, President**

Troy, N. Y.

ERASTUS CORNING, Albany**WARREN DELANO, Jr., N. Y.****JOHN M. FORBES**, Boston.**ENOCH PRATT**, Baltimore, Md.

November 6, 1848.

Railroad Iron.**THE SUBSCRIBERS ARE PREPARED TO**
take orders for Railroad Iron to be made at their
Phoenix Iron Works, situated on the Schuylkill Riv-
er, near this city, and at their Safe Harbor Iron Works,
situated in Lancaster County, on the Susquehanna
river; which two establishments are now turning out
upwards of 1800 tons of finished rails per month.Companies desirous of contracting will be promptly
supplied with rails of any required pattern, and of the
very best quality.**REEVES, BUCK & CO.,**45 North Water St., Philadelphia.
March 15, 1849.

Monument Foundry.

A. & W. DENMEAD & SON,
Corner of North and Monument Sts.,—Baltimore,
HAVING THEIR

IRON FOUNDRY AND MACHINE SHOP

In complete operation, are prepared to execute faithfully and promptly, orders for Locomotive or Stationary Steam Engines, Woolen, Cotton, Flour, Rice, Sugar Grist, or Saw Mills, Slide, Hand or Chuck Lathes, Machinery for cutting all kinds of Gearing, Hydraulic, Tobacco and other Presses, Car and Locomotive patent Ring Wheels, warranted, Bridge and Mill Castings of every description, Gas and Water Pipes of all sizes, warranted, Railroad Wheels with best fagotted axle, furnished and fitted up for use, complete. Being provided with Heavy Lathes for Boring and Turning Screws, Cylinders, etc., we can furnish them of any pitch, length or pattern. Old Machinery Renewed or Repaired—and Estimates for Work in any part of the United States furnished at short notice.

June 8, 1849.

Iron Wire.

REFINED IRON WIRE OF ALL KINDS, Card, Reed, Cotton-flyer, Annealed, Broom, Buckle, and Spring Wire. Also all kinds of Round, Flat or Oval Wire, best adapted to various machine purposes, annealed and tempered, straightened and cut any length, manufactured and sold by

ICHABOD WASHBURN.

Worcester, Mass., May 25, 1849.

American and Foreign Iron.**FOR SALE,**

300 Tons A 1, Iron Dale Foundry Iron.
100 " 1, " " " "
100 " 2, " " " "
100 " " Forge " "
400 " Wilkesbarre " "
100 " "Roaring Run" Foundry Iron.
300 " Fogl " "
50 " Catoctin " "
250 " Chikiswalungo " "
50 " "Columbia" chilling iron, a very superior article for car wheels.
75 " "Columbia" refined boiler blooms.
30 " 1 x 1 Slit iron.
50 " Best Penna. boiler iron.
50 " "Puddled" " "
50 " Bagnall & Sons refined bar iron.
50 " Common bar iron.

Locomotive and other boiler iron furnished to order.

GOODHUE & CO.,

New York. 64 South street

American Pig, Bloom and Boiler Iron.

HENRY THOMPSON & SON,
No 57 South Gay St., Baltimore, Md.,
Offer for sale, Hot Blast Charcoal Pig Iron made at the Catoctin (Maryland), and Taylor (Virginia), Furnaces; Cold Blast Charcoal Pig Iron from the Cloverdale and Catawba, Va., Furnaces, suitable for Wheels or Machinery requiring extra strength; also Boiler and Flue Iron from the mills of Edge & Hilles in Delaware, and best quality Boiler Blooms made from Cold Blast Pig Iron at the Shenandoah Works, Va. The productions of the above establishments can always be had at the lowest market prices for approved paper.

American Pig Iron of other brands, and Rolled and Hammered Bar Iron furnished at lowest prices. Agents for Watson's Perth Amboy Fire Bricks, and Rich & Co's. New York Salamander Iron Chests. Baltimore, June 14, 1849. 6 mos

LAP-WELDED WROUGHT IRON TUBES for Tubular Boilers, from 1 1/2 to 15 inches diameter, and any length not exceeding 17 feet—manufactured by the Caledonian Tube Company, Glasgow, and for sale by **IRVING VAN WART,** 12 Platt street, New York.

JOB CUTLER, Patentee.

These Tubes are extensively used by the British Government, and by the principal Engineers and Steam Marine and Railway Companies in the Kingdom.

Railroad Iron.

THE TRENTON IRON COMPANY ARE NOW turning out one thousand tons of rails per month, at their works at Trenton, N. J. They are prepared to enter into contract to furnish rails of any pattern, and of the very best quality, made exclusively from the famous Andover iron. The position of the works on the Delaware river, the Delaware and Raritan canal, and the Camden and Amboy railroad, enables them to ship rails at all seasons of the year. Apply to

COOPER & HEWITT, Agents.

October 30, 1848. 17 Burling Slip, New York.

Pig and Bloom Iron.

THE Subscribers are Agents for the sale of numerous brands of Charcoal and Anthracite Pig Iron, suitable for Machinery, Railroad Wheels, Chains, Hollowware, etc. Also several brands of the best Puddling Iron, Juniata Blooms suitable for Wire, Boiler Plate, Axe Iron, Shovels, etc. The attention of those engaged in the manufacture of Iron is solicited by

A. WRIGHT & NEPHEW,
Vine Street Wharf, Philadelphia.

Iron.

THE SUBSCRIBERS having resumed the agency of the New-Jersey Iron Company, are prepared to execute orders for the different kinds and sizes of iron usually made at the works of the company, and offer for sale on advantageous terms.—

150 tons No. 1 Boonton Foundry Pig Iron.

100 " No. 2 do. do. do.

300 " Nos. 2 & 3 Forge do. do.

100 " No. 2 Glendon do. do.

140 " Nos. 2 & 3 Lelugh Crane do. do.

100 " No. 1-Pompton Charcoal do.

100 " New-Jersey Blooms

50 " New-Jersey Fagotted Iron, for shafts

Best Bars, 1/2 to 4 inch by 1/2 to 1 inch thick.

Do do Rounds and Squares, 1/2 to 3 inch.

Rounds and Squares, 3-16 to 1 inch.

Half Rounds, 1/2 to 1 in. Ovals & Half Ovals 1/2 to 1 1/2 in.

Bands, 1 1/2 to 4 inch. Hoops, 1/2 to 2 inch.

Trunk Hoops, 1/2 to 1 1/2 in. Horse Shoe & Nut Iron.

Nail Plates. Railroad Spikes.

DUDLEY B. FULLER & Co., 139 Greenwich-st. and 85 Broad-st.

WILLIAM JESSOP & SONS' CELEBRATED CAST-STEEL.

The subscribers have on hand, and are constantly receiving from their manufactory,

PARK WORKS, SHEFFIELD,

Double Refined Cast Steel—square, flat and octagon.

Best warranted Cast Steel—square, flat and octagon.

Best double and single Shear Steel—warranted.

Machinery Steel—round.

Best and 2d gy. Sheet Steel—for saws and other purposes.

German Steel—flat and square, "W. I. & S." "Eagle" and "Goat" stamps.

Genuine "Sykes," L Blister Steel.

Best English Blister Steel, etc., etc., etc.

All of which are offered for sale on the most favorable terms by

WM. JESSOP & SONS,

91 John street, New York.

Also by their Agents—

Curtis & Hand, 47 Commerce street, Philadelphia.

Alex'r Fullerton & Co., 119 Milk street, Boston.

Stickney & Beatty, South Charles street, Baltimore.

May 6, 1848.

SPRING STEEL FOR LOCOMOTIVES, TENDERS AND CARS.—The subscriber is engaged in manufacturing spring steel from 1 1/2 to 6 inches in width, and of any thickness required: large quantities are yearly furnished for railroad purposes, and wherever used its quality has been approved. The establishment being large, can execute orders with great promptitude, at reasonable prices, and the quality warranted. Address **J. F. WINSLOW, Agent,** Albany Iron and Nail Works.

JOHNSON, CAMMELL & Co's

Celebrated Cast Steel,

AND

ENGINEERING AND MACHINE FILES,

which for quality and adaptation to mechanical uses, have been proved superior to any in the United States.

Every description of square, octagon, flat and round cast steel, sheet, shovel and railway spring steel, best double and single shear steel, German steel, flat and square, goat stamps, etc. Saw and file steel, and steel to order for any purposes, manufactured at their Cyclops Steel Works Sheffield.

JOHNSON, CAMMELL & CO.,

100 William St., New York.

November 23 1849.

American Cast Steel.

THE ADIRONDAC STEEL MANUFACTURING CO. is now producing, from American iron, at their works at Jersey City, N. J., Cast Steel of extraordinary quality, and is prepared to supply orders for the same at prices below that of the imported article of like quality. Consumers will find it to their interest to give this a trial. Orders for all sizes of hammered cast steel, directed as above, will meet with prompt attention.

May 28, 1849.

To Steam Engine Builders.

THE Undersigned offer for sale, at less than half its cost, the following new machinery, calculated for an engine of 62 inches cylinder and 10 feet stroke, viz:

2 Wrought Iron Cranks, 60 inches from centre to centre.

1 Do. do. Connecting Rod Strap.

2 Do. do. Crank Pins.

1 Eccentric Strap.

1 Diagonal Link with Brasses.

1 Cast Iron Lever Beam (forked).

The above machinery was made at the West Point Foundry for the U. S. Steamer Missouri, without regard to expense, is all finished complete for putting together, and has never been used. Drawings of the cranks can be seen on application to

HENRY THOMPSON & SON,

No. 57 South Gay St., Baltimore, Md.

Sept. 12, 1849.

Railroad Instruments.

THEODOLITES, TRANSIT COMPASSES, and Levels, with Fraunhoffer's Munich Glasses, Surveyor's Compasses, Chains, Drawing Instruments, Barometers, etc., all of the best quality and workmanship, for sale at unusually low prices, by

E. & G. W. BLUNT,

No. 179 Water St., cor. Burling Slip.

New York, May 19, 1849.

Ballard's Improved JACK-SCREW.

PATENTED.

THE ADVANTAGES OF THIS Screw for Stone Quarries, Railroads, Steam Boiler Builders, and for other purposes are superior to any other similar machine.

The improvement consists in being able to use either end of the screw, as occasion requires.

It is capable of raising the heaviest Locomotive with ease, being portable, strong and powerful, and not likely to get out of order.

Many Railroad Companies and Boiler Makers have them in use—by whom they are highly recommended.

JACK SCREWS, of various sizes, power and price, constantly on hand at the manufactory.

No. 7 Eldridge Street,

near Division Street.

New York, Jan. 19, 1850.

To Railroad Companies and Contractors.

FOR SALE.—Two Locomotive Engines and Tenders, at present in use on the Beaver Meadow Railroad, being too light for their coal trains, but well calculated for either gravel or light passenger trains.

They weigh, in running order, about 8 tons each—having one pair of driving wheels 4 feet diameter, 4 truck wheels 30 inches diameter, with cylinders 10 in. diameter, and 18 inches stroke of piston. Tenders on 4 wheels. Address **JAMES ROWLAND,** Prest. Beaver Meadow Railroad & Coal Co., Philadelphia.

or, **L. CHAMBERLAIN, Secy,**

at Beaver Meadow, Pa.

May 19, 1849.

To Inventors and Patentees.

OWEN G WARREN, ARCHITECT, Has had many years' experience as Agent for obtaining Patents, both in this country and Europe, and will transact such business promptly and reasonably. Persons at a distance can have their business done by correspondence—without the necessity of visiting this city or Washington. Office No. 94 Merchants Exchange, Wall st., corner of Hanover st., up stairs. 193

To Railroad Companies.

FOR SALE—A Second-hand Locomotive Engine and Tender, of about 10 tons weight, in good order, and warranted to perform well. Any company wanting a cheap engine for a passenger or light burden train, will rarely meet with an opportunity so favorable as the present. The engine and tender are in perfect running order, and will be tested to the satisfaction of any one wishing to purchase. Price \$1,500.

Address **J. B. MOORHEAD,**
Frazer P.O., Chester county, Pa.

P.S.—The Engine can be seen by calling on H. Osmond & Co., Car-builders, Broad st., Philadelphia. September 6, 1849.

India-rubber for Railroad Cos.

RUBBER SPRINGS—Bearing and Buffer—Fuller's Patent—Hose from 1 to 12 inches diameter. Suction Hose. Steam Packing—from 1-16 to 2 in. thick. Rubber and Gutta Percha Bands. These articles are all warranted to give satisfaction, made under Tyer & Helm's patent, issued January, 1849.—No lead used in the composition. Will stand much higher heat than that called "Goodyear's," and is in all respects better than any in use. Proprietors of railroads do not be overcharged by pretenders.

HORACE H. DAY,

Warehouse 23 Courtlandt street.

New York, May 21, 1849.

Fire Brick.

THE Subscribers have constantly on hand Rafford's Stourbridge, Oak Farms Stourbridge, Lister, Worley, Red and White Welsh Fire Bricks, common and fancy shapes. Also,

ROOFING SLATES,

from the best Welch quarries, and of all sizes. Also,

COAL,

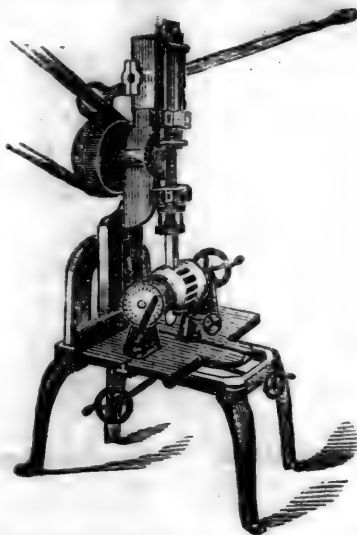
of all kinds—Liverpool Orrell and Cannel, Scotch, New Castle, Pictou, Sidney, Cumberland, Virginia, and all kinds of Anthracite coals. Also,

Pig Iron, Salt, etc., etc., for sale at the lowest market price. Apply to

SAMUEL THOMPSON & NEPHEW,
275 Pearl and 43 Gold Sts., New York.

November, 23, 1849.

**Capt. Alfred Swingle's
PATENT BORING
& MORTISING MACHINE.**



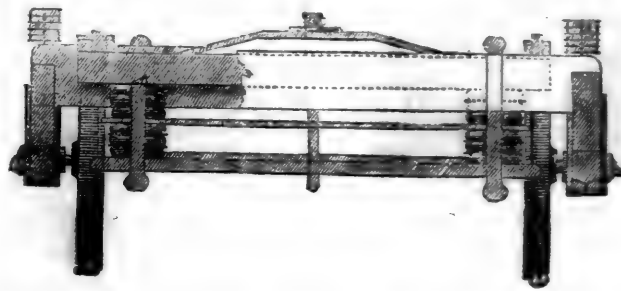
The above Machine was invented by A. SWINGLE, of Texas, in 1846, and Letters Patent were taken out in July, 1848. As a labor saving Machine it stands unrivalled even in these days of improvements. Its uses are innumerable; it may be successfully applied to Doors, Sashes, Carriages, Wheel-Hubs, and in fact to all kinds of work where the Auger and Chisel can be brought to bear.

The only limit to the speed of the working of this machine is the heating of the tools used. It will perform at least the labor of twelve men, and in vastly better manner, and can be worked equally well by steam power or by hand. It has been used and has given universal satisfaction.

For further information apply to **H. B. TOWNSEND,** 40 Wall St., New York, to whom all orders are to be addressed.

New York, December 16, 1849.

**FULLER'S PATENT
INDIA RUBBER CAR SPRINGS.**



RAILROAD COMPANIES are cautioned, before purchasing Springs, to examine the actual patents and judge for themselves.

Persons, under the Title of the New England Car Company, seeking fraudulently to invade Fuller's rights have put forth so many statements for the purpose of misleading the public, that an enumeration of some facts is absolutely necessary, for the purpose of putting persons interested upon their guard.

Fuller's patent is for the application of Discs of India-rubber with Metal Plates, for forming Springs for Railway Cars and Carriages—either one disc and two plates, or ten discs and plates, or any other number, are equally covered by the patent. Fuller is not bound to the use of short discs—he may use long discs and plates.

Ray's patent is simply and wholly the forming of air-tight rubber cylinders, with hoops or bands round the outside, and the combination of elasticity of India rubber, with the elasticity of atmospheric air confined in the cylinder, and in no part of his patent is he authorized to use the form of spring which he is now fraudulently supplying to Railroad Companies. Such springs are direct and positive infringements of the very letter of Fuller's patent.

Fuller's patent is dated October, 1845, Ray's patent, August, 1848.

The spring patented by Ray never has been put in operation, and never can be made useful for Railroad cars.

A mere experiment, even if made, it is well known does not prove an invention; and it is ridiculous for such parties to hope to mislead the Presidents and Superintendents of Railroad companies, by claiming the invention because Ray alleges he made an experiment—which Fuller had made before him—had actually brought into working order, and obtained a patent for—and this too before Mr. Ray states he made his experiment—and that experiment not claimed to have been applied to a car or carriage.

Besides, the invention could not have been developed until India rubber, properly Vulcanised, could be made of a sufficient thickness. In the United States the art of vulcanising rubber by steam heat, (by which

means only can a body of rubber having any considerable thickness be vulcanised,) was not introduced until after the grant by the American government of the patent for springs to Fuller—whereas the process of vulcanising rubber by steam heat was invented in England about three years previously, and was used by Fuller there. This fact refutes entirely the claim of invention put forth by Mr. Ray, and proves the impossibility of his pretensions being true.

Fuller was the first and only inventor of the spring. A Mr. Dorr, whose connection with Mr. Goodyear is well known in this country, applied in England to Mr. Fuller, after he had published and patented his invention, and introduced another party for the purpose of obtaining the agency for the United States. They were furnished with a complete set of drawings and models, and with instructions to make arrangements for the supply of material of American manufacture—from that hour to the present not a single communication has been received from them. Some of these identical models have been traced into the hands of parties now seeking to invade Fuller's rights, and who have exhibited them as specimens of their own invention.

After this, the conveyance was made by Goodyear to certain parties here for the use for railroad springs of what he calls his Metallic rubber. Comment is unnecessary.

There are 5 or 6 different processes for the manufacture of vulcanised rubber, patented by as many different parties, some here, some in England, either of which would probably make good springs.

A large and powerful company has been organized under Fuller's patent, the particulars of which shall be given very shortly.

An action has been commenced against three railroad companies for infringement; and all other parties will assuredly be prosecuted if they continue farther to infringe upon Fuller's patent.

W. C. FULLER,

The only persons authorized to supply the Springs are **G. M. KNEVITT,** 38 Broadway, N. York, General Agent for the U. S.; and **JAS. LEE & Co.,** 18 India Wharf, Boston. **JOHN THORNLEY,** Chestnut st., Philad.

Arch St. Machine Shop.
BIRKENBINE, MARTIN & TROTTER,

Makers of

STEAM ENGINES,

and

HYDRAULIC MACHINERY,

NO. 16 ARCH STREET,

PHILADELPHIA.

Will construct Steam Engines, Pumps, for Draining Mines and Land; supplying Water to Towns, Factories, Farms, etc;

Also, Street Stops, Fire Plugs, Water Tanks, and Hydraulic Rams, with (BIRKENBINE'S PATENT VALVES.)

B., M. & T. contract for Warming and Ventilating Buildings by Steam or Warm Water.

J. E. Mitchell,

NO. 14 OLD YORK ROAD, PHILADELPHIA.

Importer and manufacturer of

New Castle Grindstones, of all sizes and grits.
Nova Scotia
Wickersley
French Burr
Cocaheo
Cologne
American and

Patent compressed } Millstones, made to order, with all the recent improvements.
Garnikirk } Fire Bricks and Tiles of various sizes.

Burr Blocks, Bolting Cloths, Mill Irons, etc.

To the Proprietors of Rolling Mills and Iron Works.

THE Undersigned—Proprietors of Townsend's Furnace and Machine Shop, Albany—are extensively engaged in the manufacture of Machinery and fixtures for Iron, and Copper Rolling Mills, and Iron Works. Having paid particular attention to the manufacture of *Rolls* (Rollers), both *chilled* and *dry-sand*, they feel confident that they can execute orders for such castings in a satisfactory manner. And to give assurance of this, they beg leave to refer to the following named persons, proprietors and managers of some of the most extensive rolling mills in the country, viz: Jno. F. Winslow, J. Tuckerman, H. Burden, W. Burtt, J. & J. Rogers, Salsus & Co., J. B. Bailey, L. G. B. Cannon, Hawkins & Atwater, etc., etc.

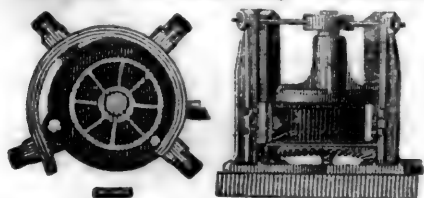
F. & T. TOWNSEND.

Albany, August 18, 1849.

Steam Boiler Explosions.

THE Subscriber having been appointed sole Agent for Faber's Magnetic Water Gauge, is now ready to supply the trade, and also individuals with this celebrated instrument. Besides the greatest safety from explosion resulting from its use, it is a thorough check against careless stoking and feeding. In marine engines it will regulate the exact quantity required in the "blow off." Pamphlets containing full information, can be had free on application to the Agent

JOSEPH P. PIRSSON,
Civil Engineer, 5 Wall st.

MACHINERY.**Henry Burden's Patent Revolving Shingling Machine.**

THE Subscriber having recently purchased the right of this machine for the United States, now offers to make transfers of the right to run said machine, or sell to those who may be desirous to purchase the right for one or more of the States.

This machine is now in successful operation in ten or twelve iron works in and about the vicinity of Pittsburgh, also at Phoenixville and Reading, Pa., Covington Iron Works, Md., Troy Rolling Mills, and Troy Iron and Nail Factory, Troy, N. Y., where it has given universal satisfaction.

Its advantages over the ordinary Forge Hammer are numerous: considerable saving in first cost; saving in power; the entire saving of shingler's, or hammerman's wages, as no attendance whatever is necessary, it being entirely self-acting; saving in time from the quantity of work done, as one machine is capable of working the iron from sixty puddling furnaces; saving of waste, as nothing but the scoria is thrown off, and that most effectually; saving of staffs, as none are used or required. The time required to furnish a bloom being only about six seconds, the scoria has no time to set, consequently is got rid of much easier than when allowed to congeal as under the hammer. The iron being discharged from the machine so hot, rolls better and is much easier on the rollers and machinery. The bars roll rounder, and are much better finished. The subscriber feels confident that persons who will examine for themselves the machinery in operation, will find it possesses more advantages than have been enumerated. For further particulars address the subscriber at Troy, N. Y. P. A. BURDEN.

Railroad Spikes and Wrought Iron Fastenings.

THE TROY IRON AND NAIL FACTORY, exclusive owner of all Henry Burden's Patented Machinery for making Spikes, have facilities for manufacturing large quantities upon short notice, and of a quality unsurpassed.

Wrought Iron Chairs, Clamps, Keys and Bolts for Railroad fastenings, also made to order. A full assortment of Ship and Boat Spikes always on hand.

All orders addressed to the Agent at the Factory will receive immediate attention.

P. A. BURDEN, Agent,
Troy Iron and Nail Factory, Troy, N. Y.

RAILROAD WHEELS.

CHILLED RAILROAD WHEELS.—THE UNDERSIGNED are now prepared to manufacture their Improved Corrugated Car Wheels, or Wheels with any form of spokes or discs, by a new process which prevents all strain on the metal, such as is produced in all other chilled wheels, by the manner of casting and cooling. By this new method of manufacture, the hubs of all kinds of wheels may be made whole—that is, without dividing them into sections—thus rendering the expense of banding unnecessary; and the wheels subjected to this process will be much stronger than those of the same size and weight, when made in the ordinary way.

A. WHITNEY & SON,
Willow St., below 13th,
Philadelphia, Pa.

CHILLED RAILROAD WHEELS.—THE UNDERSIGNED, the Original Inventor of the Plate Wheel with solid hub, is prepared to execute all orders for the same, promptly and faithfully, and solicits a share of the patronage for those kind of wheels which are now so much preferred, and which he originally produced after a large expenditure of time and money.

A. TIERS,
Point Pleasant Foundry.

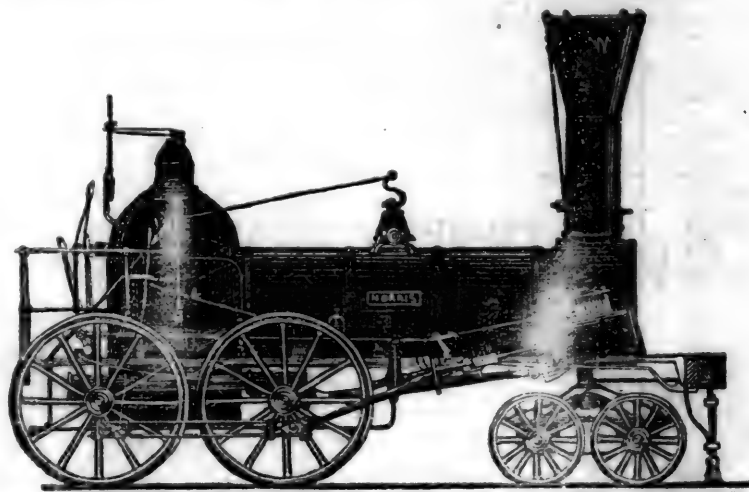
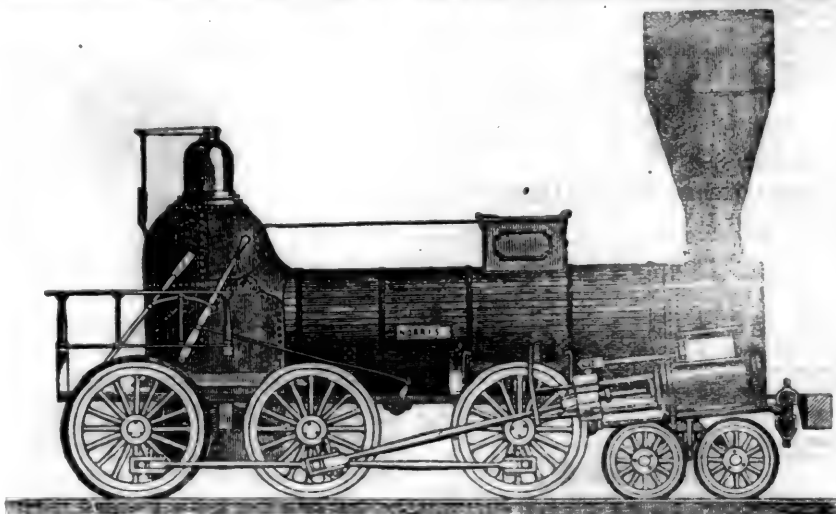
He also offers to furnish Rolling Mill Castings, and other Mill Gearing, with promptness, having, he believes, the largest stock of such patterns to be found in the country.

Kennington, Philadelphia Co.,
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AMERICAN RAILROAD JOURNAL.

STEAM NAVIGATION, COMMERCE, MINING, MANUFACTURES.

HENRY V. POOR, Editor.

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GEN. CHAS. T. JAMES, *For Manufactures and the
Mechanic Arts.*
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American Railroad Journal.

PUBLISHED BY J. H. SCHULTZ & Co., 136 NASSAU ST.

Saturday, February 23, 1850.

CAUTION.

RAILROAD COMPANIES and others are hereby cautioned against using or vending our improvement for easing the lateral motion as applied on Railroad Cars. Letters Patent having been granted to us in 1841, any party or parties so making or using said improvement without license from us will be proceeded against according to law.

DAVENPORT & BRIDGES.

Free Banking.

A friend from the State of Maine, has requested us to give a synopsis or abstract of the present Law of New York known as the Free Banking Law. The act of April 18, 1838, entitled "An Act to authorize the business of banking," is the foundation of this system, and the legislation on the subject runs through the statute book from that time to the present.

We propose, in future numbers, to give a full synopsis of the Laws of New York in relation to this matter.

Bangor and Waterville Railroad.

We learn that over four thousand shares, or something more than the amount, (\$400,000) required to enable the stockholders to organize the company were taken up in the stock of the Penobscot and Kennebec railroad company during the present week. We are further told that arrangements are so far consummated that as soon as the line can

be thoroughly surveyed and the necessary connections formed, that the road will be put in progress. Whoever will take the trouble to look carefully over a map of Maine will see, that with no competing line between the Penobscot and Kennebec rivers, this road offers inducements to capitalists beyond any unoccupied route in New England.

Portland and Montreal Railway.

The importance which this great international line of railway, from the Atlantic seaboard to the St. Lawrence river at Montreal, has acquired, in view of the recent measures adopted for its completion, lead us to give pretty full extracts from the Fifth Annual Report of the Directors of the St. Lawrence and Atlantic Railroad Co., laid before the Stockholders on the 16th of January last.

There has been exhibited a degree of boldness and of energy in the prosecution of this great enterprise, in all the successive stages of the undertaking, scarcely paralleled in the history of the railway system. The success of these efforts has so far been equal to the most ardent wishes of its friends.

The details of the measures by which the completion of the road has been made certain, will serve as useful hints to parties engaged in similar enterprises.

There seems to be no good reason why enterprises of acknowledged utility, and ensuring a certain return of interest on their cost, should not be aided by the corporate credit of cities, a majority of whose property holders have embarked their means in their construction.

The Directors of the St. Lawrence and Atlantic Railroad Company beg leave to submit their Annual Report.

The directors have the honor to report that the section of the railroad from Longueuil to St. Hyacinthe was opened for traffic on the 27th December, 1848, and with certain unavoidable interruptions, continued in operation until the 15th November last, when, under the new arrangements, hereinafter stated, it was finally discontinued. The result will appear in the accounts.

The directors have further to state to the proprietors, that in the view of raising additional funds for the completion of the railroad, they caused a bill to be brought before the legislature at its last session, authorising the issue of "new and preferential shares" in the company, which should be entitled to a dividend of six per cent. in preference to the original shareholders. This bill, which also contained other provisions deemed necessary for the proper arrangement of the affairs of the company,

received the Royal assent on the 30th May last, and is now laid before the proprietors.

The directors have to congratulate the proprietors on the legislature of Canada having, at its last session, passed a bill for affording the Provincial guarantee to the bonds of all railroad companies, the extent of whose works should amount to not less than 75 miles, whenever one half of such road should be completed, provided that the sum to be so guaranteed should not exceed that expended by the company. The said act also contains provisions for the formation of a sinking fund, and is wisely calculated to promote the construction of works of undoubted utility, but which the paucity of individual resources in the Province might otherwise indefinitely postpone. In the case of the St. Lawrence and Atlantic railroad, the directors are bound to acknowledge that unless they had thus received the assistance of the Province, they must for a long period have despaired of their ability to complete this work, which the position of commercial affairs shows to be essential not merely to the city of Montreal, but to retaining a large share of the western trade to the channel of the St. Lawrence.

Although the directors derived great encouragement from the action of the legislature, their hopes of immediate success were for a season much depressed by the unfortunate political disturbances which at the same period agitated this city. They felt that until time had mitigated the effect of these disturbances, it would not be in their power to mature any scheme for the promotion of the enterprise; and they anxiously awaited the moment when public confidence should be sufficiently restored to warrant their making an appeal to those parties on whom they relied for aid to enable them to fulfill the condition attached to the governmental assistance, by the completion of one half of the railroad to the Province line, viz: 33½ miles beyond St. Hyacinthe.

In the month of July, the directors believed that the period had arrived when action could be advantageously taken, and in this assurance an application was addressed to the corporation of the city of Montreal, urging on them the importance of following the example of the corporation of the city of Portland by their granting their aid to the St. Lawrence and Atlantic railroad company to the extent of £125,000, by the subscription of new and preferential shares, payable by city debentures, bearing 6 per cent. interest. While this application was pending before the city council, a negotiation was opened with Messrs. Black, Wood & Co., the principal contractors, on the section already completed, to ascertain whether they would undertake the completion of the railroad, receiving in payment the various securities which the directors were in treaty for. A preliminary proposal was in consequence made by this firm in accordance with the wishes of the board, and was accepted as a basis for a future contract, and the terms of it com-

municated to the city council, as evidence of the ability of the company to complete the railroad, on receiving the assistance of the city to the extent named. The directors have reason to believe that the information thus conveyed to the city council had an important effect in removing the objections of many influential individuals, and also operated on the public mind to produce the almost unanimous acquiescence of the citizens to the scheme laid before them by the council, and which resulted in the adoption, on the 6th August last, of a resolution pledging the city to take £125,000 in the preferential stock of the company, conditional on £25,000 of similar stock being lodged in their hands as security for the due payment of the interest, and further conditional on their being satisfied that the company had otherwise provided the means of completing the outlay that, with the city subscription, was required to entitle the railroad to the assistance of the Province.

After having advanced to this point, the directors resorted to the offer of Messrs. Black, Wood & Co., for the purpose of ascertaining how far it might be possible to carry the proposal into effect.

It may here be proper to observe that the directors felt that the time had arrived when a powerful effort might be made to ensure the speedy completion of the entire road. They believed that to endeavor to proceed section by section, as their means might be made available, was to lower the value of the company's stock for an indefinite time—that doubts would continually be thrown on the ability and inclination of both their own and the American corporation to complete their respective portions of the entire line—that, notwithstanding the reports of engineers, a doubt would always rest on the public mind as to the ultimate cost of the road, and its ability successfully to compete for the western trade—and that, as the necessities of the company required them to make part payment of their work in stock, it was manifestly their interest to endeavor to raise the value of that stock, by effecting such an arrangement as would remove from the public mind all doubts and fears arising from the above causes.

The only method that appeared to ensure these great results, was to effect a joint engagement with the Portland company, whereby the entire line remaining unfinished should be simultaneously put under contract for a certain specified sum per mile, provided parties could be found who would undertake a work of such magnitude, and in whose character and resources the two corporations would have confidence. The offer of Messrs. Black, Wood & Co., seemed to this board such as to warrant the belief that, with the co-operation of the Portland Co., the desired arrangement could be carried out; and with a view of effecting the negotiations, Messrs. Young & Galt were nominated a committee to proceed to Portland to bring the views of the board to a successful termination.—The proceedings of this committee the board have not space to state at length to the proprietors, but they are most happy in informing them that they found in Portland the most decided determination to prosecute the great enterprise, and that after a few days spent in negotiations, agreements were mutually entered into by the committee on the part of this company and the directors of Atlantic and St. Lawrence railroad company, on their own part with Messrs. Black, Wood & Co., for the execution of the entire uncompleted portion of the railroad from Montreal to Portland, at the specific price of £6550 per mile, the whole work to be completed within three years from the execution of the final contract. For the sum named, the contractors engaged to purchase land, complete the road with all bridges, turnouts, fences and appurtenances of every description similar in character to the portion of the road already built, when that should be completed by ballasting, excepting only the cost of engineering, the station and engine houses and water stations. The company to have the entire control of the engineering and direction of the work, arrangement of gradients, etc., and they further reserved the station and engine houses, and water stations, as the engineer of the company was not prepared to define the exact position, number and dimensions of their buildings.

The terms of payment arranged by the committee were as follows: £125,000 to be paid in the

city of Montreal debentures at par—one-fourth of the entire contract price, in the original stock of the company at par—and the balance in the bonds of the company bearing six per cent. interest, to be hereafter guaranteed by the government under the terms of the act passed for that purpose. It was further stipulated, that the contractors should accept in payment of the first 33½ miles required to be built prior to the Provincial guarantee being granted, the city bonds, and shares of the company at par, thereby relieving the directors of the necessity of providing funds, and also complying with the condition attached to the aid granted by the city.

The agreement entered into was subsequently ratified by the directors on the 15th September last.

While these negotiations were in progress, the pressure of the various claims against the company for work performed on the section from Longueuil to St. Hyacinthe became so serious, that the directors found that assistance had become absolutely necessary to enable them to carry out their plans, owing to the default made in payment of a large amount of subscribed stock of the company, principally held in England, on which reliance had been placed.

The directors believed that the sum of £50,000, added to the other assets of the company, would relieve them from embarrassment, and they trusted that this sum, in equal proportions, might be obtained from the Seminary of St. Sulpice, and the British American Land Co., who had both a very great indirect interest in the success of the enterprise. The mode in which it was proposed that this aid should be extended, was, by guarantee of railroad company's bonds, and the principal difficulty in submitting the application arose from the fact of the company possessing no other security of the payment of the principal and interest, than the section of the railroad in operation, which, from various unavoidable causes, had, up to that time, yielded no revenue.

The directors, while their more immediate object was to ensure the payment of existing liabilities, could not overlook the fact, that during the future execution of the work, provision had to be made for the payment of £7500 per annum interest on the city debentures, and a further sum as interest on the government guarantee, whenever the progress of the work entitled them to demand it. These sums, with the proposed loan of £50,000 amounted, by calculation, in three years, during which the road was to be completed, to £33,000.

At the same time that the necessities of the company evidently dictated the adoption of such steps as would virtually ensure the payment of the above large sum, the conviction had been forced upon the directors, that, from various causes, the operation of the railroad by the company was not conducted with that economy they desired, and the expenses of their establishment were also heavier than circumstances warranted.

In this position, the directors decided to conclude a lease of the railroad, section by section, as completed, to Messrs. Black, Wood & Co., on terms that will be stated hereafter; whereby they were enabled to offer the Seminary and Land Company satisfactory security for the payment of interest on their proposed loan, and also to provide against the various other liabilities to arise during the progress of the work.

Not to occupy the time of the proprietors with unnecessary details, it will suffice for the board to state that the application to the seminary for their guarantee of £25,000 was successful, conditional on like assistance being afforded by the British American Land Company, which has since been agreed to by the directors of that company.

It will further be gratifying to the proprietors to learn, that the directors are informed that the Atlantic and St. Lawrence railroad company in Portland have executed a contract for the completion of their portion of the railroad with the same firm, and on similar terms.

To enable the company to issue the new and preferential stock to the city of Montreal, the assent of the proprietors was necessary. This was obtained at the special meeting held on 24th December, and the board are happy to state that the mayor of the city of Montreal subscribed the amount agreed upon, \$125,000, on the 26th of the same month.

The directors now beg to submit to the proprie-

tors the following abstract of these important arrangements:

They have executed a contract with Messrs. Black, Wood & Co., for the entire completion of the railroad to the Province line, to be finished by sections as follows:

St. Hyacinthe to the St. Francis, 38 miles, by 1st December, 1850.

St. Francis to Sherbrooke, 24 miles, by 1st December, 1851.

Sherbrooke to the Province line, 35 miles, by 1st December, 1852.

On the terms already stated in the report.

They have further executed a lease of a railroad for three years and two months, to Messrs. Black, Wood & Co. as follows:

From Longueuil to St. Hyacinthe, from 1st January, 1850, to 1st March, '53.

St. Hyacinthe to St. Francis, from 1st January, 1851, to 1st March, 1853.

For the sum of £40,260, payable as follows:

1st July, 1850, £3000 1st Jan., 1852, £7305

1st Jan., 1851, 3000 1st July, " 9825

1st July, " 7305 1st March, 1853, 9825

The company being bound, when duly notified, to furnish additional equipment, to the amount of £12,500; and the railroad, with appurtenances and equipment, to be returned to the company in perfect running order on the expiration of the lease.

They have also executed a contract with Messrs. Black, Wood & Co. for ballasting the section from Longueuil to St. Hyacinthe.

In all of these arrangements the directors have to acknowledge the very able assistance rendered them by the engineer of the company, C. S. Gzowski.

The city of Montreal has subscribed new and preferential shares for £125,000, and the debentures to be issued to the company are now in course of preparation.

The directors have further obtained under certain conditions which are now in course of being complied with, the guarantee of the Seminary of St. Sulpice, and the British American Land Company, to the railroad company's debentures for £50,000, payable in ten or fifteen years, on security of a mortgage on the railroad, with a right to accept preferential shares, and on an assignment of the sum of £3,000 yearly of the rent payable by Messrs. Black, Wood & Co.

With reference to the action already taken by the contractors, under the recent arrangements, the directors have the pleasure to submit a report from the engineer of the company.

In closing this statement of the transactions of the year, the directors feel themselves warranted in congratulating the proprietors on the circumstances in which the company now stands. And the directors are proud in being able to point to the arrangements they have made, as having, thanks to the generous of the corporations of the city of Montreal, of the Seminary, and of the Land Company, placed this company in a position of perfect ability, so far as can be foreseen, to complete their enterprise, and also, such as to warrant the directors in expressing their confident belief, that, although delay must occur in the payment of interest on the paid up capital, yet the investment may now be regarded as likely to equal the hopes of the most sanguine.

All which is respectfully submitted,

A. N. MORIN, President.

Montreal, 16th January, 1850.

RAILWAYS OF THE UNITED KINGDOM OF GREAT BRITAIN AND IRELAND.

The Companion to the British Almanac publishes annually an article upon the Railways of Great Britain. We compile from the volumes for 1849 and 1850 the following valuable statistics of the Railways of the United Kingdom.

Years.	Railway acts.	Miles sanctioned.
1801 to 1840	.....299	about 3000
1841	..... 19	15
1842	..... 22	67
1843	..... 24	91
1844	..... 48	796
1845	.....120	2883
1846	.....272	4790
1847	.....184	1863

In 1848, 83 new acts were passed, but of these only about 30 were empowered to construct new branch lines not exceeding 300 miles. In 1849, 36 new railway acts became law, 12 of which only contain provisions for new branch lines. The remaining acts are for the increase of capital, or to authorise deviations, leases, etc.

The monetary or Stock Exchange aspect of the railway system has exhibited most lamentable features, during 1849. The half yearly dividends declared by the companies, and the current market prices of the shares, have suffered an amount of declension beyond even the gloomy anticipations entertained in the preceding year. The London and North Western is almost the only company which has maintained in 1849 the same rate of dividend, even, as in the preceding year, viz: 7 per cent. The Great Western, the Midland, the Lancashire and Yorkshire, the York and Newcastle, the York and North Midland, the Eastern Counties, the South Eastern, the South Western, Brighton, the Manchester and Lincolnshire—all have suffered a decided diminution of dividend. These ten great companies, whose works up to the present time have cost over one hundred millions sterling, have on an average declared, for the half year ending in the summer of 1849, a dividend on the regular non-guaranteed shares at the rate of less than 4 per cent. per annum—somewhere between 3 and 4 per cent. The remaining companies, about 60 in number, omitting the London and North Western, can hardly have reached an average of 2 per cent. per annum in the same half-year. Many of them, including the Caledonian, the Chester and Holyhead, the Great Northern, the Eastern Union, and others, in which the outlay has been very large, have barely realised enough to pay guaranteed interest and preference dividends, leaving nothing whatever for the regular shareholders; and a few though open for traffic, have been unable to pay even the guarantees.

This diminution in the actual commercial value of the undertakings has told unfavorably on the market prices. The disastrous state of matters in 1849 was brought about rather by political and commercial panic, than by deterioration in the real merits of the railway system; but the result of an over supply of lines is now felt significantly in diminished mileage receipts. The number of persons who wish to travel, and have the means of paying for travelling, does not increase so rapidly as the amount of capital laid out upon new railways: hence the sum available for net profits is relatively smaller; hence the dividends are less; and hence the market prices are lower. The London and N. Western, the Brighton and South Coast, and one or two other companies, have their shares at a somewhat higher price in October, 1849, than in October, 1848; but with these exceptions a declension has been general. In some of the companies the market price of shares was seven times as great in 1845 as in October, 1849.

There have lately been issued many parliamentary papers, besides the annual reports of the railway commissioners, which contain a mass of valuable information relating to the present state of the railway system. The object of these papers has been to exhibit both the social and the financial results of the system—the results to the travelling public, and to the railway operatives, as well as to the shareholders.

The first of these returns which we shall notice gives an account of the number and classification of all the persons employed in all the railways, in any capacity, at a particular date.

This return, applicable to May 1, 1848, is divided into three portions. 1st, The railways which were open for traffic on that day; 2d, Those which were in course of construction on that day; and 3d, Those on which works had not yet commenced. The lengths of these three portions were as follows:

Finished and open.....	4253 miles.
In progress.....	2958 "
Not commenced.....	4430 "

11,641

The number of companies engaged on those works was about 170. The number and description of persons employed on the whole were as follows:

	On lines open for traffic.	On lines not open.
Secretaries	81	102
Managers	30	93
Treasurers	29	21
Engineers	95	405
Superintendents	343	1897
Storekeepers	125	243
Accountants	70	145
Cashiers	48	88
Draughtsmen	106	306
Clerks	4360	887
Artificers	10,814	29,087
Laborers	14,297	147,325
Inspectors	—	119
Land surveyors	—	26
Miners or quarrymen	—	6250
Foremen or overseers	1010	685
Policemen	2475	71
Porters and messengers	7559	10
Platelayers	4391	256
Drivers and carters	—	45
Engine drivers	1752	—
Engine stokers	1809	—
Guards	1464	—
Switchmen	1058	—
Gatekeepers	401	—
Wagoners	141	—
Brakemen	32	—
Miscellaneous	197	116
Total	52,688	188,177

A few of the above, such as secretaries, engineers, etc., are probably enumerated twice, in relation to the opened and unopened portion of the same company's lines, but without attending to this slight diminution, we have the very large total of 240,865 persons employed upon British railways at one time. Of course the artificers and laborers who form so large a percentage of the whole, are relatively much more numerous on the partially finished than on the finished lines. The number of stations in the 4253 miles of railway open for traffic on the day in question was 1321, being nearly equal to one station for every three miles. If any day in the year 1849 had been taken for the enumeration, the numbers employed would probably have been smaller; for the difficulty of raising funds has compelled many of the companies to suspend operations on new works. Of the 2958 miles in progress on the day of the return, [a year and a half previous to the preparation of this paper] several hundreds have been since finished; but of the 4430 miles not then commenced, and of the new works afterwards sanctioned by acts of 1848 and 1849, only a small amount has been put in operation.

The above return refers to May 1, 1848. Another parliamentary paper, for December 31, 1848, relates both to the mileage and to the capital accounts, and exhibits some very instructive features. It includes the names of 213 companies. In other returns many companies are included in one with which they have been amalgamated; and this accounts for the discrepancy which often appears in such lists. The number of miles of railway belonging to all these companies open for traffic on the last day of 1848 was 5127. The excess of this beyond the 5080 miles given in another return for the same date, is attributable to the admission of a few miles of mineral [not passenger] railway in the one return, and not in the other. The length in progress was 2111, and the length not yet commenced 4795, making a total authorised length of 12,033 miles. [The former return for the 1st May in the same year, eight months previous, gave a total of 11,641 miles.] All the lines then open were double-railed, except 750 miles.

The financial arrangements of the companies present an astounding result. There had been paid up in actual cash by shareholders, to the end of 1847, the sum of £126,143,476, and by the lenders of money on debentures or other securities £40,788,765, making a total of £166,938,241. During the year 1848 the capital received by the companies, in shares was £30,359,102, and by loans £2,875,715, together £33,234,813. This sum added to the former gives, for the total money paid by shareholders and security holders down to the 31st December, 1848, the truly enormous sum of £200,173,059. In addition to all this, the various companies retained powers to raise, by existing shares, by new shares,

or by loans, in 1849 and subsequent years, a further sum of £143,717,773. There is yet another addition to be made, in respect to acts passed in 1849; but this is not a very large item, relatively to former years.

The following is an abstract of the actual working of the whole of the railways in one given half year.

The number of companies actually working in the United Kingdom, to which this return relates, is 73. On account of the pending arrangements between some of the companies, concerning amalgamations and leaseings, it is doubtful how far exact accuracy could be attained; but the above is given as that which corresponded to the actual number of distinct companies working their lines at the close of 1848.

The total number of passengers conveyed on the 5080 miles of passenger railway then open, in the half year ending December 31, 1848, was 31,630,292; viz, 3,743,602 first class; 12,191,549 second class; 7,184,032 third class; 8,450,624 parliamentary class; and 60,485 mixed class. The parliamentary class includes those whom the companies are obliged to accommodate, with at least one train a day in each direction at a penny per mile; the third class comprises those extra passengers whom the companies voluntarily convey, at fares lower than those of the second class: the mixed class is composed of those whom it has been found difficult to place under any of the other three headings. If we consider the third class as a general term, to be made up of the three last mentioned classes, we have the number 15,695,140. The gross receipts for conveying all the passengers amounted to £3,283,301, viz: first class, £1,003,516; second class, £1,360,468; third class, £919,317.

The above figures give us the materials for a few valuable averages. As there were 645 miles of new railway opened at different periods of the half year in question, the average mileage requires adjustment in making it the medium of calculation. We may take 4760 miles as about the average length for the half year; and hence we find that first class travelling amounted to 786 persons per mile, second class 2561 per mile, and third class 3297; in taking all the classes together we have 6644 passengers per mile. The third class passengers were nearly equal in number to those of the first and second class combined. The fares varied from 0.32d. per mile [third class on the Glasgow and Greenock] to about 3jd. [first class express on some of the lines.] Each passenger, taking an average of all the journeys of all the classes, paid 2s. 1d. for his journey. This seems a very low average; but it becomes explicable when we take into account, first, the extensive use of day tickets, which reduces the price; and second, the immense numbers carried, at fares of a few pence each, on the Greenwich, the Blackwall, the North Woolwich, the Croydon, the Richmond, the Manchester and Ashton, the Manchester and Stockport, the Leeds and Bradford, the Newcastle and Shields, the Glasgow and Greenock and the Dublin and Kingstown railways. [The North Kent line will add to this list, but it was not opened at the period in question.] Separated into classes, we find that each first class passenger paid 5s. 4d. per average journey, each second class 2s. 3d., and each third class 1s. 2d. So far as can be determined from the returns, this gives an average of about 25 miles for first class journeys, 17 for second class, and 16 for third class. It is a natural consequence of the opening of new lines, and the supplying of defective links in long series of railway, that the average length of journeys increases. The total gives a mileage of about five hundred and fifty millions of miles of travelling, in journeys of about 18 miles each on an average, at an average charge of rather less than 1s. per mile. The effect of the discount on double journeys is taken into account in the above averages.

The gross receipts for goods, parcels, mails, carriages, cattle, etc., in the same half year, amounted to £2,461,663, which added to the £3,283,301 received from passengers, gave a total of £5,744,964. At the present time, allowing for additional lengths of railway open, the total receipts must be about one million sterling per average month. If the state of the manufacturing districts had been as flourishing as in some previous half years, the monthly receipts would have far exceeded this av-

erage. It amounts to about £47 per mile a week. The receipts of the London and North Western, the greatest of the companies, have for many half-years maintained an average of about £100 per mile per week: sometimes a little more, but at other times a little less.

The openings of new lines, since the date of our last publication, have been pretty general throughout the kingdom. Beginning at the south, and working upwards towards the north, we find that the South Eastern company has opened its important North Kent line, commencing by a junction with the Greenwich line near the Surrey canal, and ending by a junction with the Gravesend and Rochester line at Gravesend; the Greenwich railway has been widened to receive this additional traffic, which promises to be very large. A junction between the North Kent line and the Bricklayers Arms branch has also been opened. The Reading, Guildford and Reigate line, leased in perpetuity to the South Eastern company, and extending 46 miles in length, has been opened. The Brighton and South Coast co. has opened two short branches to Eastbourne and Hailsham. Of the branch lines belonging to the South Western co. there have been opened the loop line from Barnes thro' Chiswick to Hounslow, the Hampton Court branch, the Farnham branch, the Godalming branch, the Fareham and Portsmouth branch, and in the present autumn will be opened the extension from Datchet into Windsor. The operations of the Great Western company, in respect to new lines, have been limited; the lease of the Bristol and Exeter line has terminated; and the greater part of the enormous works undertaken in 1845-6, and guaranteed by the Great Western company, are still unfinished. The branches from Reading to Basingstoke, from Slough to Windsor, and from Chippenham to Westbury, are the only two portions opened. The South Devon railway has been finished in the two remaining miles from Laira to Plymouth.

In the Eastern and Midland districts, we find that the new opening have been numerous. The Maldon and Braintree branches, and the Sudbury branch by the Eastern Counties company, have been opened; as have also the extension from Stowmarket to Norwich, by the Eastern Union; and the Great Northern from Peterborough to Boston, from Boston to Gainsborough, and from Retford to Doncaster—these three last named portions, with other connecting links, have opened a new line of communication between London and Yorkshire. The East Lincolnshire, [leased to the Great Northern] has finished the remainder of its line from Boston to Louth. The Manchester, Sheffield and Lincolnshire company has opened its connecting links so far as to give direct communication from Manchester to Great Grimsby, through Sheffield, Worksop, Retford and Gainsborough, together with branches to Lincoln and to the Humber opposite Hull. The Midland company has opened the Nottingham and Mansfield, and the Erewash Valley branches, and has extended the Leicester and Swannington branch to Burton, where it comes into connection with the North Staffordshire line. The London and North Western company's operations have not extended to any considerable mileage of additional railway; still there have been some important openings; the Ashton and Huddersfield, the Leeds and Dewsbury, and the portion of the of the Shropshire Union between Stafford and Shrewsbury, have been brought to a completion. The Shrewsbury and Birmingham line has been opened from Wolverhampton to Wellington. The Chester and Shrewsbury line, which had previously been opened to Rhuanabon, has been extended to Shrewsbury. The North Staffordshire Company has nearly finished the whole of its extensive works; all being now opened except two short branches. The works of the South Staffordshire Company, previously opened from Bescot to Walsall, has been since extended through Lichfield to Alrewas. The Manchester and Matlock Railway has been opened from Ambergate to a few miles beyond Matlock. The Chester and Holyhead line is still wanting the line which will be shortly supplied by that unparalleled work of engineering—the Britannia tubular bridge.

In the North of England, the new openings have not been so numerous as in the central Counties. The York and North Midland and the York and Berwick Companies have added but little to the

lengths of line previously opened. The Leeds and Thirsk Railway, previously opened from Thirsk to Harrogate, has been extended to Leeds. The Lancashire and Yorkshire Company has opened the branches from Knottingly to Doncaster, and from Bury to Liverpool. A junction has been made at Methley between the Midland and the Great Northern lines. The South Yorkshire has been opened from Doncaster to Swinton. The Rossendale district of Lancashire has had a few additional miles of railway opened. The Whitehaven and Furness Railway is extended to Ravenglass.

In Scotland, the extensive and complex works of the Caledonian Company have been further advanced towards completion; the Clydesdale Junction, the Hamilton branch, and a new entrance into Glasgow, have been opened. The North British Railway has been extended from St. Boswell to Hawick. A few additional miles of railway have been opened in the district westward of the Caledonian lines; and the same may be said of the busy mineral district, lying within a short distance north and south of the Edinburgh and Glasgow Railway. The Nithsdale line has been opened from Closebun to Dumfries, whence a line has been for some months open through Annan to the Caledonian at Gretna. The Edinburgh and Northern line has been so far finished as to afford through routes between Edinburgh, Dundee, and Perth—excepting of course the Firths of Forth and Tay. The uninterrupted route from Stirling to Aberdeen is open nearly from end to end; from Stirling to Perth runs the Scottish Central; from Perth to Frickheim there are two lines, one through Dundee and Arbroath, and one through Cupar and Forfar; from Frickheim the line is open to Brechin and Montrose; and it will probably by the end of the present year extend into Aberdeen. There is not a yard of railway north of Aberdeen; and many years are likely to elapse before such will be attempted; although there is an Act in existence for a line from Aberdeen to Inverness.

In Ireland a few steps have been made towards completing the net-work of railways. The Great Southern and Western extends from Dublin to Mallow, 22 miles from Cork, and the extension from Mallow to Cork has just been opened at the time we are now writing; a branch extends from this line near Tipperary to Limerick. The Irish South Eastern Company has opened 10 miles from Carlow to Bagnalstown. The Midland Great Western line has been extended 14 miles from Kinnegad to Mullingar. The Londonderry and Enniskillen Company has opened a portion of the line, from Londonderry to Strabane; and 19 miles of the Dundalk and Enniskillen line have been finished.

With respect to the new works carried on in 1849, there were 320 miles of new railway opened from January 1 to June 30; which, added to 5,157 previously open, makes a total of 5,447 miles. The passengers during the first half of 1849 amounted to 28,761,895. The railway calls for the first ten months of 1849 amounted to 17,700,964., against 30,072,610. in the first ten months of 1848.

In conclusion we may remark, that the Atmospheric system of traction has gone so far out of favor, that only the mile or two from Kingston to Dalkey, in Ireland, is managed in that manner; that the broad gauge has been increased in mileage by only a very small amount; that the magnificent stone viaducts over the Tyne and the Tweed are approaching completion; that the broad estuaries of the Humber and the Tay are crossed by steamers so formed as to receive rails and carriages upon their decks; that the Electric Telegraph is laid down along nearly all the main lines; and that fatal accidents on railways, instead of increasing in the same ratio as the mileage open, are decreasing both relatively and absolutely. This decrease of accidents has led to a remarkable application of the theory of probabilities to railways, in respect to *assurance* from death or injury. An Insurance Company has been formed, to work out the following plan: When a first class passenger takes his ticket, to go on any railway, he pays 3d. additional for a Life Insurance, which remains in force during the continuance of the journey, whether it be hours or only minutes. If a railway accident causes his death during that journey, the company

is responsible to his representatives for a payment of 1000l. In the second class it is 2d. for 500l., and in the third 1d. for 200l. A smaller payment is made for bodily injury without loss of life. The company can form its calculations only by observing the *average* ratio of accidents in past years.—Another form of the same system, emanating from a different source, is to insure a passenger during all the railway journeys that he may take in a period of 3, 6, or 12 months: the sum insured being 1000l., and the premium paid being 10s., 16s., or 20s., according to the length of insurance:—no distinction of class is here made.

Annual Report of the Canal Commissioners.

STATE OF NEW YORK,
CANAL COMMISSIONERS' OFFICE,
31ST DECEMBER, 1849.

To the Legislature of the State of New York:

In accordance with the provisions of chap. nine, title nine, article second, of the first part of the Revised Statutes, and of chapter 350 Laws of 1847, the Canal Commissioners submit their annual report.

The board of Canal commissioners consisted, on the first day of January, 1849, of Nelson J. Beach, whose term of office extended to the first January, 1850; Jacob Hinds to the first January, 1851; and Charles Cook, (who has been re-elected in November preceding) to first January, 1852.

The board of commissioners was organized at their office in the State Hall, on the 1st day of January, 1849, by the re-appointment of Charles Cook, as President, and Nelson J. Beach as Secretary.

To Nelson J. Beach was assigned, in special charge, the eastern division of the canals, consisting of the following works:—

	Miles.
The Erie Canal, from Albany to the west side of the Oneida creek feeder.....	141
The Champlain canal.....	66
The Glen's Falls feeder.....	12
The pond above the Troy dam.....	3
The Oneida Lake Canal.....	6
The Oneida creek feeder.....	2
The black river canal, not finished.....	87
Total.....	317

To Charles Cook, the middle division, consisting of the Erie Canal, from the west side of the Oneida creek feeder to the east line of the county of Wayne, including the several feeders.....	76
The Chenango canal.....	97
The Oswego do.....	38
The Cayuga and Seneca.....	23
The Chemung do.....	39
The Crooked lake do.....	8
The Cayuga inlet.....	2
The Seneca river towing path.....	5
The Oneida river improvement.....	20
Total.....	308

To Jacob Hinds, the western division, consisting of the Erie Canal, from the east line of the county of Wayne to Buffalo, including the basins at the latter place.....	155
The Genesee Valley canal, not finished.....	118
Total.....	273

Summary.	
Eastern Division.....	317
Middle do.....	308
Western do.....	273

Total of authorized canals..... 898

Of the canals completed and authorised to be constructed, 723 miles have been in use the past season. To this will be added, on the opening of navigation in 1850, thirty-five miles of the Black river canal and Erie canal feeder and twenty miles of the Oneida river improvement; making 778 miles of canals and feeders, which will be in use at that time. There will then remain to be completed of the work now authorised and not in use, ten miles of canal and forty-two miles of slack water navigation of the Black river canal, and sixty-eight miles of the Genesee Valley canal. When these works are finished this state will possess a canal communication 899 miles in length.

In no previous year has the navigation of the

canals been subject to so little delay as for the year just closed. Detentions formerly so numerous and so vexatious and expensive to boatmen have nearly ceased; and the arrival of packets and line boats can be calculated with nearly the same certainty as of steamboats upon the Hudson. To this desirable result the introduction of the water of the Black river, in July last has much contributed. Without this, it is questionable if navigation could have been maintained upon the long level during the unprecedented low water of the last season.

The following exhibits the weekly average tonnage of boats upon the Erie canal in 1847, 1848 and 1849, taking one of the heaviest laden boats per day, which arrived at West Troy from Black Rock; and also the average time of making the passage between those points during the same period. This shows that the time of passing in 1847 was 10½ days, with an average cargo of 67 tons; with a cargo of 71½ tons in 1848, the time was 9 days; and in 1849, with a cargo of 67 4-5 tons it was but 8 3-5 days; showing a decrease of more than two days in the average time of passage between 1847 and 1849, or a saving of 1-5th in time and expenses to boatmen to do the same amount of business in 1849 that was required in 1847; or sufficient time saved in 1849 for an additional trip to Buffalo and back. This saving of expense, taking the cost of the trip at \$200, (which is a trifle less than the average of 3,500 boats, the number supposed to be in constant use) would be \$700,000 per annum: 67 4-5 10½ 9 8 3-5.

The following is a statement showing the number and the various tonnage of each class of boats, to Jan. 1, 1850:

Scows.	Deck	Lake	Bull	Line.	Pack-	To-
	Scows.	heads.	ets.	tal.		
1,281	1,555	856	417	675	78	4,863

The largest boat load which passed over a considerable portion of the canal weighed 104 800-2, 000 tons, being that of the boat of T. J. Davis, from Oswego to Troy, with a cargo, principally of flour. Within a few years, a boat carrying 30 to 40 tons was considered to be very heavily laden, and it was supposed at that time that the canal, with 42 feet surface and 4 feet depth of water was taxed to its utmost capacity for transportation. Now, with the same depth of water, and generally the same surface, and a boat that can pass an old lock, more than double the cargo is taken without difficulty.

The annexed is a statement of amounts expended by the Canal Commissions, including their salaries, during the fiscal year ending the 30th September, 1849, upon the several canals for all purposes other than repairs:

On the Erie and Champlain canal....	\$9,585 31
On the enlargement of the Erie canal, 1,011,418 43	
On the Black river canal.....	373,878 99
On the Chenango canal.....	817 88
On the Oswego canal.....	4,939 70
On the Cayuga and Seneca canal....	51,932 64
On the Chemung canal.....	19,376 06
On the Crooked Lake canal.....	2,168 87
On the Oneida river improvement....	6,080 00
On the Genesee Valley canal.....	184,768 71

\$1,513,862 71

There has also been expended by the commissions since the close of the fiscal year, and to 1st January, 1850, the following sums, viz:

On the Erie and Champlain canal....	\$1,148 08
On the enlargement of the Erie canal.	326,060 04
On the Black river canal.....	71,867 72
On the Genesee Valley canal.....	132,497 82
On the Oswego canal.....	18,098 92
On the Cayuga and Seneca canal....	20,384 92
On the Chemung canal.....	21,275 24
On the Chenango canal.....	5,047 91

Annexed is a table of lockages at Alexander's Lock, three miles west of Schenectady:

No. of lock's from op'g to close of canal.	Average hours.	Average No. of boats to pass navigation.	No. of days.
1849.....	36,918	168 57	8 66
			219

We annex a statement showing the amount expended by the superintendents of repairs, and the average cost per mile on each and all of the canals from 1846 to 1848, both inclusive:

Year.	Total miles.	Total average per mile.
1826.....	440	414
1827.....	440	528
1828.....	478	490
1829.....	500	509
1830.....	500	442
1831.....	500	361
1832.....	500	630
1833.....	537	694
1834.....	545	879
1835.....	545	793
1836.....	545	745
1837.....	642	766
1838.....	642	759
1839.....	642	591
1840.....	694	664
1841.....	700	511
1842.....	700	646
1843.....	700	547
1844.....	700	663
1845.....	700	743
1846.....	700	729
1847.....	700	709
1848.....	700	964
1849.....	700	744

Statement of tolls collected at the several collectors' offices in 1848 and 1849; together with the increase or decrease at each office for the latter year:

Office Col-lected at.	1848.	1849.	Increase.
New York....	\$131,482 80	\$214,683 28	\$83,200 48
Albany.....	365,407 21	337,390 58	28,016 63*
West Troy..	384,511 70	353,063 23	31,448 48*
Schenectady.	9,857 28	11,296 52	1,439 24
Fultonville.	12,703 28	11,433 53	1,279 75*
Little Falls.	12,193 76	12,055 11	140 65*
Utica.....	72,205 08	58,746 16	13,458 92*
Rome.....	37,582 72	38,514 72	932 00
Syracuse....	105,938 15	92,819 55	13,118 59*
Montezuma.	104,046 39	94,346 58	9,699 81*
Lyons.....	21,686 75	19,225 70	2,461 05*
Palmyra....	50,026 65	58,178 48	8,151 43
Rochester..	310,719 33	199,472 91	11,246 42*
Brockport..	38,579 33	64,060 10	25,480 77
Albion.....	26,125 56	21,629 46	4,496 10*
Lockport... 137,692 94		238,081 23	95,398 30
Black Rock.	260,022 01	63,689 34	196,332 67*
Buffalo....	672,618 09	757,491 36	84,873 27
Waterford..	10,965 16	9,578 95	1,386 31*
Schuylerville	13,027 59	7,145 50	5,882 09*
Glen's Falls.	—	7,338 56	7,338 56
Whitehall..	50,460 45	53,838 27	3,377 82
Salina.....	50,397 19	41,492 50	8,904 69*
Oswego.....	225,265 00	280,680 04	55,415 04
Geneva.....	59,172 61	48,161 00	11,011 61*
Havana.....	12,857 79	13,158 01	300 22
Horse Heads	36,121 48	25,895 10	10,226 33*
Corning....	34,911 95	34,166 60	745 35*
Dresden....	7,835 14	9,278 53	1,443 39
Penn Yan..	19,498 87	21,925 55	2,426 68
Hamilton... 4,232 04		3,626 19	605 85*
Oxford.....	8,378 74	6,524 18	1,854 56*
Binghamton	8,334 74	5,642 18	2,692 56*
Scottsville.	31,180 56	30,610 59	569 97*
Dansville... 25,368 21		26,741 84	1,373 63
Higgins....	813 65	1,285 00	571 35

\$3,252,212 19 3,269,226 03 371,522 18
Total decrease.....\$355,508 34

* Decrease.
Tolls collected yearly on each of the State Canals, also the amount of tolls received yearly from railroads, up to 1849, inclusive, and the aggregate amount of all the tolls so received:

Year.	Erie	Champlain	Oswego
Up to Canal.			
1849.....	1,453 83	163 27	3,207 87
Cayuga and Seneca			
Year. canal.			
Up to canal.			
1849.....	468 73	2,173 96	794 26
Average Annual Per Cent of Increase.			
59 92	6 53	152 76	20 38
135 87	49 64	8 06	
Total Per Cent of Increase.			
Genesee			
Year Valley			
Up to canal.			
1849.....	968 92	77 71	1,550 89

Cayuga inlet.	Rail-roads.	Aggregate of tolls received.
—	1,227 77	1,687 17
Average Annual Per Cent of Increase.		
29 88	9 71	516 96
306 94	64 89	

The annexed is a statement and classification of the tons and value of the total movement of all articles upon the canals, and the tolls upon each class, from 1837 to 1848 inclusive: [The returns for 1849 were not received in time to insert them.]

PRODUCT OF THE FOREST.			
Year.	Tons.	Value.	Tolls.
1837.....	618,741	\$6,146,716	\$211,118
1838.....	665,089	6,338,063	229,993
1839.....	667,581	7,762,553	253,710
1840.....	587,047	4,609,035	197,904
1841.....	545,548	11,841,103	313,444
1842.....	504,507	5,987,219	211,979
1843.....	687,164	6,653,180	200,755
1844.....	864,373	7,422,737	363,547
1845.....	881,774	6,472,237	413,613
1846.....	916,976	6,422,409	354,886
1847.....	1,087,714	7,546,063	368,225
1848.....	1,080,880	7,219,350	367,494
Total Per Centage of Increase.			
75 64	17 45	74 07	
Average Annual Per Centage of Increase.			
6 88	1 58	6 73	

AGRICULTURE.			
Year.	Tons.	Value.	Tolls.
1837.....	208,643	\$16,201,331	\$370,041
1838.....	255,227	19,390,714	468,495
1839.....	215,063	17,056,911	476,543
1840.....	393,780	18,644,481	808,623
1841.....	891,905	21,901,713	785,943
1842.....	401,276	16,987,843	805,376
1843.....	455,797	20,588,211	922,710
1844.....	509,387	23,379,643	1,009,773
1845.....	355,169	20,470,438	1,088,671
1846.....	874,258	35,820,986	1,439,793
1847.....	1,092,946	65,767,166	2,031,746
1848.....	913,844	42,850,086	1,602,905
Total Per Centage of Increase.			
339 24	164 48	333 19	
Average Annual Per Centage of Increase.			
30 84	14 95	30 29	

MANUFACTURES.			
Year.	Tons.	Value.	Tolls.
1837.....	81,735	\$6,390,485	\$75,507
1838.....	101,526	5,915,856	74,941
1839.....	111,968	5,989,576	81,251
1840.....	100,367	4,719,054	75,765
1841.....	127,896	5,422,615	95,595
1842.....	98,968	4,435,280	70,611
1843.....	124,277	4,925,545	93,231
1844.....	144,245	6,151,806	123,061
1845.....	160,638	6,994,932	111,236
1846.....	149,006	7,015,311	81,288
1847.....	176,448	8,070,059	94,648
1848.....	202,781	7,433,957	112,355
Total Per Centage of Increase.			
148 21	46 32	48 80	
Average Annual Per Centage of Increase.			
13 44	41 48	40	

Subjoined is a statement of merchandise and other articles:

MERCHANDISE.			
Year.	Tons.	Value.	Tolls.
1837.....	94,777	23,935,990	\$380,825
1838.....	124,290	31,594,692	596,911
1839.....	132,286	39,493,761	535,486
1840.....	112,021	35,636,943	427,966
1841.....	141,054	50,134,320	558,003
1842.....	101,446	30,042,153	393,876
1843.....	119,209	40,051,718	592,667
1844.....	141,930	49,224,099	585,147
1845.....	151,450	52,514,336	625,920
1846.....	169,799	52,084,488	548,227
1847.....	224,890	74,763,638	670,979
1848.....	261,458	76,945,463	779,420
Total Per Centage of Increase.			
175 87	221 46	104 65	
Average Annual Per Centage of Increase.			
15 98	20 13	9 15	

OTHER ARTICLES		
Tons.	Value.	Tolls.
1837.....	168,000	\$3,134,766
1838.....	186,879	2,507,233
1839.....	257,826	3,096,960
1840.....	223,231	2,793,379
1841.....	215,258	2,903,178
1842.....	130,644	2,509,104
1843.....	126,972	3,458,368
1844.....	156,651	4,742,867
1845.....	228,543	5,140,866
1846.....	218,623	4,349,315
1847.....	287,812	5,034,502
1848.....	331,287	5,637,301

Total Per Cent of Increase.

97-19 83-02 165.

Average Annual per Centage of Increase.

8-63 7-53 15.

Year.	Total Value.	Tolls on boats and passengers.	Total Tolls.
1837.....	\$55,809,288	\$195,508	\$1,289,430
1838.....	65,746,559	219,457	1,589,357
1839.....	73,309,764	181,923	1,614,966
1840.....	68,303,892	185,022	1,775,747
1841.....	92,902,929	179,819	2,034,882
1842.....	60,046,608	165,515	1,749,196
1843.....	76,276,909	156,004	2,081,590
1844.....	90,920,852	191,879	2,446,374
1845.....	100,621,950	195,426	2,646,181
1846.....	115,612,109	223,669	2,756,106
1847.....	150,563,428	278,022	3,635,381
1848.....	110,086,157	240,341	3,252,212

Total Per Centage of Increase.

51 22-93 152-22

Average Annual Per Centage of Increase.

13-63 2-08 13-83

The Annexed is a statement of tonnage ascending and descending, and the total of both; the value of ascending and also of descending freight; and the total of both, and the tolls from 137 to 1848 inclusive:

[The returns for 1849 were not received in time to insert them.]

Year.	Tons of up freight.	Value of up freight.	Tons of down freight.
1837.....	559,515	33,986,934	611,781
1838.....	692,531	42,708,949	640,481
1839.....	833,585	53,178,565	602,128
1840.....	747,031	43,090,319	669,012
1841.....	747,327	64,977,607	774,334
1842.....	570,305	37,265,595	666,626
1843.....	676,578	47,823,501	839,861
1844.....	737,492	56,737,985	1,019,024
1845.....	780,068	55,100,924	1,204,943
1846.....	906,343	64,516,853	1,362,319
1847.....	1,125,527	78,471,014	1,744,283
1848.....	1,348,325	89,202,250	1,437,905

Total Per Centage of Increase.

140-98 162-46 136-68

Average Annual Per Centage of Increase.

12-81 14-77 12-42

Year.	Tons of down freight.	Value of both.	Tolls.
1837.....	21,822,354	55,809,288	1,289,430
1838.....	23,038,510	65,646,559	1,589,357
1839.....	20,163,199	73,309,764	1,614,966
1840.....	23,213,578	68,303,892	1,705,747
1841.....	27,225,332	92,202,929	2,034,882
1842.....	22,751,013	60,016,608	1,749,196
1843.....	28,453,403	76,276,909	2,081,590
1844.....	34,183,167	90,921,952	2,446,374
1845.....	45,452,325	100,553,245	2,646,181
1846.....	51,105,256	115,612,109	2,756,106
1847.....	73,092,414	151,562,428	3,635,381
1848.....	50,883,907	146,086,157	3,252,212

Total Per Centage of Increase.

133-12 150-00 152-22

Average Annual Per Centage of Increase.

12-10 13-73 13-83

The following is a statement of the tons of wheat and flour arriving at tide water, the produce of this State, and its value, the tons and value of that coming from other states, by way of Buffalo, Black Rock and Oswego, and the tolls; also, the tolls on

all other articles moving on all the canals, and the total tolls from 1837 to 1848 inclusive:

[The returns for 1849 were not received in time for insertion.]

TONS FROM OTHER STATES			
Year.	By way of Buffalo.	By way of Black Rock.	By way of Oswego.
1837.....	27,206	—	7,429
1838.....	57,977	—	10,910
1839.....	60,182	7,697	15,108
1840.....	95,573	12,825	15,075
1841.....	106,271	24,843	16,667
1842.....	107,522	13,035	14,338
1843.....	146,126	12,882	25,858
1844.....	145,510	15,669	42,293
1845.....	118,814	17,066	44,560
1846.....	247,860	16,564	63,905
1847.....	380,053	18,489	87,329
1848.....	253,325	19,376	90,411

Total Per Centage of Increase.

1198-70 115-73 1,117-13

Average Per Centage of Increase.

108-97 16-86 101-55

Total Per Centage of Decrease.

— — —

Average Annual Per Centage of Decrease.

— — —

Year.	Tons the produce of this state.	Total tons arriving at tide-water.
1837.....	81,856	116,491
1838.....	65,093	133,080
1839.....	41,796	124,683
1840.....	121,389	244,862
1841.....	53,569	201,364
1842.....	63,336	198,231
1843.....	63,914	248,780
1844.....	74,393	277,865
1845.....	140,223	320,463
1846.....	91,037	419,363
1847.....	65,334	511,205
1848.....	68,529	431,641

Total Per Centage of Increase.

— 27-05

Average Annual Per Centage of Increase.

— 2-45

Total Per Centage of Decrease.

— 15-28

Average Annual Per Centage of Decrease.

1-48 —

Year.	Total Value.	Tolls.
1837.....	9,640,156	301,739
1838.....	9,883,586	380,161
1839.....	7,217,841	404,525
1840.....	10,862,602	700,071
1841.....	10,165,355	621,045
1842.....	9,284,778	606,737
1843.....	10,243,454	731,616
1844.....	11,111,177	816,711
1845.....	15,962,950	851,533
1846.....	18,836,412	1,099,325
1847.....	32,090,938	1,460,424
1848.....	21,148,421	1,126,133

Total Per Centage of Increase.

119-38 273-21

Average annual Per Centage of Increase.

10-85 24-83

Tolls on all other articles.

Year.	Tolls.	Total Tolls.
1837.....	987,691	1,289,439
1838.....	1,209,196	1,589,357
1839.....	1,210,441	1,614,966
1840.....	1,075,676	1,705,747
1841.....	1,413,836	2,034,882
1842.....	1,142,469	1,749,196
1843.....	1,349,874	2,081,590
1844.....	1,629,683	2,446,374
1845.....	1,794,648	2,646,181
1846.....	1,656,781	2,756,106
1847.....	2,174,957	3,635,381
1848.....	2,126,079	3,252,212

Total Per Centage of Increase.

145-25 152-22

Average Annual Per Centage of Increase.

10-47 13-83

The average time per year that the canal has been opened for navigation for this period is 230 days; the greatest length of time in one year, was 269 days, in 1828, and the shortest, 214 days, in '46 and in '47.

The average time of navigation on the Hudson has been 276 days per year; the longest time in any one year was 320 days, in '28, and the shortest 242 in '43.

The earliest opening of the lake was the 7th March, '42, and the latest the 16th May '37.

The comparative value of commerce upon the canals of this state with the value of the foreign commerce of the United States is as annexed:

Total value of imports, exclusive of specie, into the United States, for the year ending the 30th June, 1848.....	\$154,977,876
Total value of all articles transported on the canals for the year 1847....	151,563,428

Difference in favor of foreign importations..... \$3,414,448

Total value of imports into the United States, exclusive of specie, for the year ending 30th June, 1849.... \$147,857,390

Total value of all articles transported on the canals for the year 1848.... 140,086,157

Difference in favor of foreign importations..... \$7,771,282

The total exports, exclusive of specie, for the year ending June 30, '48, were of domestic productions..... \$132,704,121

Add value of foreign products afterwards exported..... 21,126,010

Total exports, exclusive of specie, for the year ending 30th June, '49, were of domestic productions..... \$132,666,955

Add value of foreign products afterwards exported..... 13,088,865

Total exports, the growth, produce or manufacture of the United States, for the year ending the 30th June, '48..... 132,704,121

Total value of all articles transported on the canal in '47..... 151,563,423

Difference in favor of canal commerce \$18,859,307

Total exports, the growth, produce or manufacture of the United States, for the year ending the 30th June, '49..... \$132,666,955

Total value of all article on the canal in '48..... 140,086,157

Difference in favor of canal commerce \$7,419,283

From the above statement it appears that the value of the canal commerce of the State of New York, in the year 1847, exceeds the total domestic exports from the United States for the year ending the 30th of June, 1848, by the sum of \$18,859,307; and the canal commerce for the year 1848 was greater than the domestic exports for the year ending 30th June, '49, \$7,419,202.

The value of the American lake commerce for the year 1847 was as follows:

	Imports.	Exports.	Total of both
Lake Ontario.....	\$9,688,485	11,627,770	21,316,255
" Erie.....	51,450,975	58,147,058	109,598,033
U. Lakes.....	5,087,158	5,309,105	10,396,263

66,226,618 75,083,933 141,310,551

The value of western products received at New Orleans, for '48 and '47 was \$84,912,800.

All which is respectfully submitted,

N. J. BEACH,
CHARLES COOK,
JACOB HINDS.

Indiana in 1850.

Samuel Merrill, Esq., formerly President of the State Bank of Indiana, and afterwards President of the Madison and Indianapolis railroad, has communicated some interesting statistics of that rapidly growing State, in a letter to Hamilton Smith, which is published in the Cannelton Economist.

Mr. Merrill puts the total population of the State on the 1st of July last, at 1,025,000. Steamboat navigation (the Ohio) on the southern border of the State, "at least eleven months in the year," 370 miles; on the Wabash, "for about four months in the year," 330 miles; on the St. Joseph, "for about six months," 20 miles; on lake Michigan, 50 miles, making a total of 770 miles of steamboat navigation. The flat boat navigation is stated at 1580 miles. It consists, in addition to the Ohio, Wabash and St. Joseph, above mentioned, of the following particulars: White River, four months, 50 miles; West Fork, two months, 235 miles; East Fork, two months, 175 miles; Muscakitack, one month, 75 miles; Potoka, three months, 50 miles; Anderson, two months, 30 miles; Vermillion, two months, 20 miles; Tippecanoe, three months, 75 miles; Kan-kakee, six months, 100 miles; Fallow, three mos., 30 miles.

Indiana has the following railroads and parts of railroads completed, viz: Madison and Indianapolis, 86 miles; Shelbyville branch, 16 miles; New Albany and Salem, 33 miles; Jeffersonville and Columbus, 26 miles; Shelbyville and Rushville, 20 miles; Shelbyville and Knightstown, 26 miles; Lafayette and Indianapolis (north end) 33 miles; Peru and Indianapolis (south end) 22 miles; Indianapolis and Bellefontaine, 28 miles; Terre Haute and Indianapolis (west end) 33 miles, making a total of railroads completed, 323 miles. The amt. equipped and in use is not stated.

A railroad from Lafayette to Crawfordsville, 28 miles, has been put under contract, and Mr. Merrill says of the 56 miles of the Indianapolis and Bellefontaine road, not included above, "the whole will soon be completed." In addition, Mr. M. says—"surveys have been made to extend the New Albany and Salem railroad to Bedford 30 miles, on the whole route from Jeffersonville to Columbus about 40 miles beyond the part under contract. The Lafayette and Indianapolis railroad has been surveyed to this place [Indianapolis] 63 miles in all. Peru and Indianapolis do., 70 miles in all. Terre Haute and Indianapolis do., 73 miles in all. These last two roads will progress to completion, but not rapidly."

The agricultural products of Indiana last year, Mr. Merrill estimates at 45,000,000 bushels corn, 8,000,000 bushels wheat, 18,000,000 bushels oats, rye, barley, etc. Hogs fattened last year, 1,300,000 head, of which he supposes 650,000 were exported. Average price of wheat through the state 50 cents. Near a market it was from 66 to 70 cents per bushel, remote from a market 40 cents; corn from 10 to 30 cents, according to situation. Hay is stated to average in price \$5 per ton. Beef and pork are put at \$1 50 to \$3 per 100 lbs.

There is much irregularity in the assessments of property for taxation. Mr. Merrill thinks that real estate is assessed at about two thirds its actual value. On this the State, county and road taxes, amt. to about 40 cents on the \$100, or 26 1/2 cents on the actual value.

Of the 22,400,000 acres of land in the State, Mr. M. represents that 14,200,000 acres is first rate farming land, 4,450,000 inferior farming land, and 3,750,000 refuse land.

THE IRON TRADE.

The supplies of iron sent forward from the interior of Pennsylvania in 1848 and 1849, have been as follows:

1849—ROUTE.	Nails & spikes, pounds.	Castings & blooms, pounds.	Pig and scrap, pounds.	Bar and sheet, pounds.	Totals
Chesapeake and Delaware canal.	925,986	3,691,825	41,091,379	4,568,391	27,250,847
Delaware canal, Bristol.	742,041	466,381	58,552,532	61,696	14,988,360
Schuykill Navigation.	2,582,720	6,354,880	77,490,560	7,963,200	1,117,515
Columbia and Reading railroads.	2,794,400	1,578,900	2,063,300	10,223,860	10,223,860
Norristown railroad.	.....	2,930,416	5,935,600	4,448,060	18,730,700
Totals	7,045,147	14,112,405	185,133,371	27,250,847	50,926,123

Cost of Locomotive Engines.

It is a gratifying fact to know that with all the skill, experience and capital of England, and the cheapness of labor there, in comparison with the liberal price paid in this country, that locomotive engines of the same general capacity, are furnished more cheaply from American workshops than from those of Great Britain.

Locomotives.	Cost in Eng-land.	Cost in United States.
15 in. cylinder, 20 tons weight.	\$9,360	\$8,300
16 " " 22 " "	10,142	8,000
18 " " 25 " "	12,000	10,000

English engines frequently exhibit a higher finish than most American engines; but for service and strength they are not superior to many now made in this country. We may safely predict, that the rapid advances now being made in mechanical invention in this country, with the opportunity afforded our mechanics to obtain the best results of the experience of the past, accumulated in the old world, will in the course of the next twenty years, place American skill in every branch of mechanical industry in advance of that of any other people.

From the London Mining Journal.

The Scotch Iron Trade—Annual Returns.
Throughout the year the course of the market for pig iron has been devious, and the result, we believe, in many instances, not equal to the expectations of parties operating. In anticipation of extensive spring demand, the market opened with animation and firmness, and the advancing prices which marked the close of 1848, progressed from 44s. to 48s. 6d. for mixed Nos. up to 53s. in the end of February, when it was discovered the hoped for demand had been over anticipated; the advantage could, therefore, be no longer maintained, and the price gradually declined to 42s. in May following. The settlement of the Schleswig-Holstein question afterwards revived the hopes of holders and speculators, and, under the influence of some fall export orders, the price again improved, attaining 46s. in

July and August, when—this demand having been supplied—it again receded to 42s. to 42s. 6d. in October. Since that date the market has fluctuated remarkably, forced up to 48s., receding to 45s., and recovering afterwards to 47s.—the prices again drooping almost imperceptibly to 45s. 6d. to 46—Last week business was more active, and the current value has advanced to 47s. to 47s. 6d. mixed Nos., and 48s. No. 1.—prompt cash, free on board, with 1s. to 1s. 6d. extra on three months open contract.

A steady, though not active, business has been transacted in manufactured iron, which has ruled between £5 10s. and £6 10s. for merchant bars.—We consider the present quotation of £5 10s. to £5 15s., less 4 per cent. discount for cash, to be well maintained, with rather more cheering prospects for spring orders.

Our tables show that, as compared with 1848, the product and stock of pig iron are 92,000 and 95,000 tons respectively in excess, while the entire shipments are 14,858 tons less—being 153,183 tons to foreign imports, and 221,943 tons coastwise in 1849 against 162,151 tons foreign, and 227,833 tons coastwise in 1848; they also include the comparative annual exports of this article to each country since 1846, with the prices per month, and the production and stock over the same period, and present the gratifying fact, that, notwithstanding the extreme depression in the iron trade generally, and the falling off in shipments and diminished consumption for malleable iron purposes in Scotland this year, the increase of stock has been little more than commensurate with the extra production since 31st Dec., 1848. It, therefore, follows that our local and interior requirements must have improved to the extent of the above decrease in the items of shipments and malleable iron.

Taking into consideration the extensive stocks here and throughout the north of England (where foundries and others having availed of the late temporary, yet extensive, reduction of rates of transport, per railways and canal, in Lancashire, &c., to lay in heavy supplies on extremely advantageous terms), as well as on the seaboard of America, and the actively increasing make of Scotch pig iron, there may be some reason to apprehend a marked increase of accumulated stock in this district by the time spring shipments open; and should the American Government succeed in further taxing this article in their tariff, these circumstances combined would have a very unfavorable effect on the iron interests of the country. The general belief, however, is that the present rate of duty on pig iron in America will remain unaltered this session of Congress, in which case, as also from the commercially favorable state of that country, an increased extent of exports thither may be anticipated.

The continent of Europe being now politically quiet, a result similarly favorable may also be expected from that quarter.

PRICES OF PIG IRON.		Price in 1846.		1847.		1848.		1849.	
January	....	24	0s. 0d.	3	13	4.2	8	4.2	7 0
February	....	3	17	6.3	13	4.2	10	4.2	11 7
March	....	3	10	0.3	11	1.2	4	1.2	9 9
April	....	3	6	0.3	10	8.2	1	9.2	8 0
May	....	3	10	0.3	5	3.2	2	3.2	3 9
June	....	3	8	0.3	5	0.2	3	0.2	4 4
July	....	3	10	0.3	8	1.2	5	6.2	5 0
August	....	3	15	0.3	7	9.2	5	3.2	5 4
September	....	3	13	6.3	6	0.2	5	3.2	4 0
October	....	3	0	6.2	19	10.2	3	0.2	2 10
November	....	3	9	0.2	11	0.2	3	0.2	4 3
December	....	3	12	6.2	7	6.2	2	4.2	7 2
Averages	....	23	16	3.3	11	8.3	5	0.2	6 1

PRICES OF COMMON BAR IRON.		1847.		1848.		1849.	
January	....	29	15s. 0d.	8	7	15.5	15 6a
February	....	9	10	0.8	7	16.6	5 15a
March	....	9	10	0.7	5	0.7	6 15a
April	....	9	5	0.7	5	0.6	10 0a 5 10 0
May	....	9	5	0.6	10	0.6	5 0a 5 10 0
June	....	9	5	0.6	5	0.5	5 0a
July	....	9	10	0.6	5	0.5	10 0a
August	....	9	7	6.6	5	0.5	10 0a
September	....	9	10	0.6	5	0.5	10 0a
October	....	9	5	0.6	0	0.5	7 6a
November	....	9	0	0.5	5	0.5	10 0a 5 15 0
December	....	8	0	5.5	0	0.5	12 6a 5 7 5

AMERICAN RAILROAD JOURNAL.

• Saturday, February 23, 1850.

WHISTLER MONUMENT Association.

MAJOR T. S. BROWN having, in leaving this country, resigned his office as Treasurer of this Association, the Committee appointed for that purpose have selected as his successor GEO. M. DEXTER, Esq., of Boston.

Those desiring to subscribe will therefore please direct their communications to Geo. M. Dexter, Civil Engineer, etc., Boston, Mass.

A. W. CRAVEN, Secretary, etc.

New York, February 22, 1850.

Railroad Iron.

THE UNDERSIGNED, HAVING made arrangements abroad, are prepared to contract for the delivery of Foreign rails, of approved brands upon the most favorable terms.

They will also make contracts for American rails, made at their Trenton works, from Andover Iron, in whole or in part, as may be agreed upon.

They are prepared to furnish Telegraph, Spring and Market Wire; Braziers and Wire Rods; Rivets and Merchant Bars to order, all made exclusively from Andover Iron. The attention of parties who require iron of the very best quality for special purposes, is respectfully invited.

COOPER & HEWITT,
17 Burling Slip, New York.

February 15, 1850.

Pacific Railroad.--St. Louis.

We gave last week a notice of the preliminary proceedings of the corporators named in the act of the Legislature of Missouri, to construct a railroad from St. Louis to the western line of that State. Since then we have learned that the amount now subscribed has reached \$300,000. It is believed that \$1,000,000 for this object can be obtained in St. Louis alone.

We regard this movement as by far the most important that has yet been made in reference to a railroad to the Pacific. It is the appropriate and most efficient step that St. Louis could have taken to secure to herself the western terminus of this great work. It cannot fail to place her in a stronger position than any of her rivals, and to enable to combat great odds in their favor; and, all things being equal, to carry off a prize of inestimable value.

In the first place, it is for the interest of St. Louis and Missouri to construct the proposed road through that State, if it is carried no further. We are aware that there is a general feeling existing, that railroads are articles of luxury, very pleasant and convenient to be sure, but which may very well be dispensed with without great loss or injury to the public. Nothing can be a greater mistake. As producers of wealth they take the lead among all modern discoveries. Cost of transportation is one of the items that make up the aggregate cost of an article sent to market as much as cost of production. In this country, where from the sparseness of our population, the small number of large towns, and the great distance that separates the agricultural from the manufacturing and commercial sections, the difference in the cost of transportation is what renders the surplus crops of the western farmer valuable or worthless. A remote section, by building a railroad through it, could be made to be worth thousands of dollars where it is now only worth hundreds. Man might just as well expect to make money in the manufacture of cloths by discarding the power loom, and returning to the old process of spinning and weaving by the hand, as can a city, or any section of the country, hope to retain its business and maintain its relative importance, without giving railway communications

to those sections of country upon it relies for its business and support.

What a perfect illustration of the necessity, that the construction of a railway by one town, impose upon all others which have any rival interest, to defend themselves by constructing similar works. Look at Boston. A few years since her growth was nearly brought to a stand. The Erie canal gave to New York all the trade of the West, while the trade of New England was shared by Boston in common with a great number of smaller towns scattered along the widely extended sea coast of New England. At this juncture, Boston commenced the construction of her railroads, which have rendered that city and the State of Massachusetts the leading railroad community in the world, whether we take into consideration either the excellence of their construction and management, or their relative cost and extent compared with those of any other country. Massachusetts presents the best illustration that the world has yet seen of the influence of railroads in the accumulation of population or wealth.

Guided by a wise forecast, the leading men of Boston quietly and energetically pursued the work of constructing her lines of railway, which their great wealth enabled them to push in every direction that promised to open new avenues of trade to that city. The effect of this policy was soon apparent. The life-blood that once sustained the whole was turned into one channel, and transferred to one town what had been the support of many. The business of the other commercial towns of New England melted away as suddenly as the foliage of trees wither when deprived of the sap which gives them support. It was some time before these towns could realize the cause that so suddenly deprived them of their accustomed business. As soon as they fully understood the cause, the example of Boston taught them what they must do to regain the position they had lost. What has been the result? Every seaport in New England of over 7000 inhabitants has been forced to construct or commence the construction of railroads, to open a communication with those sections whose traffic it once enjoyed. Portland, the most important commercial town in New England, next to Boston, after losing a greater part of the country trade, by a most extraordinary effort has opened important lines of railway into the interior, and is now busy in completing a net work of railways throughout the western portion of Maine: and has the means provided and a contract made for the construction of a railway from the Atlantic to the waters of the great Lakes, by the shortest possible route, which will be completed as soon as the Erie road reaches Lake Erie, or the Baltimore and Ohio railroad, the Ohio, Portsmouth and Dover, in New Hampshire, are busily engaged in constructing roads to connect themselves with the interior, and with the lines already constructed by Boston. Newburyport is constructing a road to Lawrence. Salem has already has already accomplished a similar connection. On the south of Boston, Providence has connected itself with Worcester. New London and Norwich are pushing a connection with the Western Road at Palmer, for the purpose of diverting a portion of the western trade to themselves, and opening a direct outlet for their manufactures. Hartford and New Haven are attempting to enlarge the sphere of their influence and increase their business in the same manner. Every commercial town in New England has been driven by the necessity of self-preservation to the con-

struction of railroads. If profitable as dividend-paying roads, well; if not, the loss on the stock was the penalty they were compelled to pay to maintain their position.

The reason for constructing this road simply on the grounds we have stated, have been admirably set forth in an address of Thos. Allen, Esq., submitted to the meeting of the corporators above referred to. As a matter of pure necessity, we contend that St. Louis must build the road proposed, to the west line of the State, with reference to its local trade and traffic alone.

The construction of a railroad to this extent, laying aside for the present the question of superiority of route, would exert a most powerful influence in favor of selecting it as a part of the main track of a road to the Pacific. It would turn the travel over that route, and give it the most conspicuous place in public attention. It would array a powerful interest to second any aid that Congress might extend to the work. It would greatly reduce the extent of line to be built by government. The building of a State road to the western line of Missouri would avoid all the scruples which would inevitably arise in reference to the right of the general Government to construct any portion of this road through the States. Above all, it would offer the best pledge that Congress could have, that the money granted by it in favor of this route would more probably secure the completion of the work as a whole, than if given to any scheme or route. The construction of the State road, therefore, would in all probability secure to St. Louis the ultimate terminus of the great railroad to the Pacific.

Subjoined we give such extracts as we have room to present from the address of Mr. Allen.

The question arising is, whether, under State authority and by our own means, it be expedient to commence the construction of a railroad from this city westwardly, with a view to the extension of such road ultimately to the western line of the State.

In considering this question, it is necessary to take into view our present situation, and our relations to the various railroad schemes projected in different parts of the country.

Geographically, we occupy a central position, and possess the great advantage of being at the convergence of several navigable water courses of magnificent extent, and incalculable value and importance. Nature has done much for us; and it is precisely because she has done so much, that we have not felt the necessity of doing anything for ourselves, while our neighbors, at the north and south of us, are making the greatest exertions to triumph over nature, and to obtain by art those advantages which nature denied them. At the same time, it is not to be denied that our relations to the navigable rivers constitute our chief natural advantages. The great majority of the emigrants, farmers of small means from the Eastern States, desiring to settle in the West, not willing to compete with slave labor, direct their steps to the north of us, while the emigrating planter, with his negroes, seeking a western home, turns his course, for the greater security of his slave property, to the south of us. Of the foreign emigration, our city has, it is true, received a very large share, and she has from that and other causes, chiefly commercial, prospered in an unexampled degree, while the interior of the State has also increased in population, but not with the same rapidity. For example, while St. Louis nearly doubled her population in four years, the counties bordering upon the Missouri river increased but about a third in the same time. But it is to be remembered that it is not alone with the interior of Missouri that St. Louis finds a profitable traffic. Divert the trade of the Upper Mississippi, and of the Illinois, from her, and the consequences would be felt to be of serious weight. Her commercial prosperity is founded very largely, if not chiefly, upon what is called the "produce trade." In this the productions of Illinois and Iowa, and even of Wisconsin, are extensively mingled with those of Missouri. In the past year, 1849, the number of steamboat arrivals from the upper Mississippi were 806—from the Illinois river they were 686, while from the Mis-

Missouri river they were but 355. The numerous barges, keels, flat and canal boats which arrive here, come chiefly from the upper Mississippi and the Illinois. It is evident, therefore, that St. Louis traffic is more with other States than with our own. To the great productive capabilities of the country north of us, the inhabitants apply superior industry and energy. Time, in developing their resources and increasing their wealth and population, has also brought to them the disposition and perhaps the means to increase their facilities of intercourse, and to extend the range of their market. Hence we see them devising schemes of railroad to connect them with the lakes, and with the great chain of railroads which are penetrating the West from the Atlantic cities. We see railroads projected from Chicago to Cairo, from Springfield to Quincy, from Springfield to Terre Haute, from Peoria to Oquawka, from Galena to Chicago, from Alton to Springfield, Illinois, and from St. Joseph to Hannibal, in our own State, the cost of survey in the case paid for by the State—all of them, but the first mentioned, commended to the public as probable links in the great chain which is to connect the Atlantic and Pacific. On the south of us we see projected and chartered the Missouri and White River Railroad and the Missouri and Mississippi River Railroad; railroads in Tennessee, reaching to the Mississippi, while our countrymen of the extreme south, aided and backed by the Topographical Corps of the United States, are urging forward a railroad, by the Gila route, to the Pacific at San Diego, which should have a terminus upon the Mississippi, below the mouth of the Ohio. While these movements are going on around us, St. Louis is doing nothing, and proposing to do nothing, but relying confidently upon the centrality of her position, her large capital and advanced growth, and her great "produce trade." Those who sought a friendly alliance with her in the east, and proposed to increase the facilities of intercourse by a railroad pointing directly to her have been denied the right of way, and our neighboring city of Alton even prohibited the Springfield and Alton Railroad from touching the river bank lest a long ferriage should give St. Louis the benefits which she hopes to appropriate exclusively to herself! What, then, with these schemes around us, against us, and avoiding us, is it, if any thing, expedient for us to do? Can we do any thing? Is it possible for us to devise a scheme which shall, by its tendency to increase the settlement of the interior of our State, to increase our own traffic, to introduce new and different sources of wealth, place our prosperity upon a broader and surer basis? Can we, by any process, put ourselves into a position which shall compel our enemies to inquire not how they shall best avoid us, but how can they best get to us? which shall increase our own production, our own consumption, and invite new and lasting ties of commercial and social intercourse.

If, with the increase of trade and traders, the industrial arts and artisans be also multiplied, would not the mutual dependence of the two classes go far towards placing business upon a stable foundation? Suppose we were to cheapen and facilitate transportation, bring the raw materials, cheaply and conveniently, to the hands of art, to be worked into infinite forms in our midst, give animation to business during the whole season, uninterrupted by winter, would not our market become more brisk and extensive, our means of supply increase; superior men be attracted and engaged in every department, and should we not be doing much to make St. Louis the manufactory and machine shop, as well as the emporium and metropolis of the Mississippi Valley? Nature has endowed States as well as individuals, with various gifts. Else commerce would not have existed. If another State excels us in agricultural resources, we perhaps excel her in our mineral resources. One State may produce cotton and sugar—we produce hemp and tobacco. Wheat may be the staple of one—corn and pork that of another. One people may excel another in a particular handicraft. But no one State can either produce everything or manufacture everything. But inasmuch as great diversity enters into the consumption of every people, commerce, by which they exchange the surplus of one kind of their productions, for another kind which they need, which forms part of the sur-

plus products of another people, becomes absolutely necessary. And just in proportion as we increase the diversity, the quality, the quantity, and the cheapness of our surplus productions, whether of the soil or of the factory, shall we invite, secure and extend our intercourse with other States and people.

What of these results, if any, should we obtain by a railroad to the West?

What lies to the west of us, within the reach of any railroad we might be able to construct? There are extensive beds of iron ore, of copper, of lead and of bituminous and cannel coal, and doubtless undiscovered minerals of other kinds. There are fine forests of timber; there are fertile lands for tillage, and for grazing. There lies the route of the immense emigration to the great Plains, to the land of Deseret, and to California. There goes the trail of the Santa Fe trader, and the Fur and Indian trader. There go the Indian agencies and annuities, and government stores, munitions and troops. There, upon the borders of the Missouri river, lie the most populous counties in the State, embracing, at least, one-fourth of the whole people of the State. Here is St. Louis; there is Franklin and Gasconade, and Calloway, and Osage, and Cole, and Cooper, and Howard, and Boone, and Lafayette, and Moniteau, and Saline, and Jackson and Cass, and Ray, and Clay, and Platte, and Buchanan, containing in the aggregate, with Chariton and Carroll, not far from 250,000 people and not less than 175,000 independently of St. Louis.

There, too, lies the Missouri river, turbid, dangerous, uncertain, full of snags and sandbars, and ever-changing channels, causing high insurance, costly transportation, and subject to many drawbacks and disappointments. Yet there the river runs, affording steam navigation for 2000 miles to the west of us, and bearing a commerce which has tripled in three years, and now requiring an average of one steamer per day for every day in the year. Doubtless, during the past extraordinary year not less than 40,000 persons have been passengers upon that river. But what may be regarded as the regular number of travellers I have no means of ascertaining. It may not, possibly, exceed 15,000. The number of tons brought out by the steamboats, omitting flats, rafts, and keels, estimating 355 arrivals here at an average of 300 tons the boat, would be 71,000 tons. Supposing them to carry the same up the river, and the total number of tons is 142,000; and we may add to the catalogue as lying yet to the west, the fertile territories of the Indians, the great plains, the new State of New Mexico, the mountains, the new States Deseret, and of California, and the Territory of Oregon?

Now then, in view of these people, and objects, and territories, and things unnumbered, and perhaps undiscovered, at the West, of what advantage would be a railroad in respect to them, and in respect to St. Louis?

The great modern historian of England has well said, that next to the alphabet, and the printing press, those inventions which abridge distance have done most for the civilization of mankind.—We may add, truly, that the railroad is the great apostle of progress. Though it has come into existence within the memory of most of us, and there be those among us who have never seen one, yet experience has demonstrated that it possesses magical powers to revolutionize commerce, to increase wealth and intercourse, to stimulate industry, and to develop and make available the resources of a country to the fullest extent. It has been proven to possess unequalled advantages for locomotion, and advantages which remunerate the cost. It has superseded the canal, and it is constructed without fear and without loss upon the banks of the most splendid water courses in competition with the perfection of steamboat navigation.

It carries out the city into the country; it brings the country and its abundance into the city. It equalizes the value of the products of labor, it gives new life to business, cheapens and expedites transportation, gives it certainty and punctuality, distributes the comforts of civilization, and makes travel a delight. What then would it do for us? Stimulating every species of industry in the vicinity of its route, it would in the immense increase of

production and travel, quadruple business. St. Louis, instead of being dull in the winter in consequence of closed navigation, would be lively through all the season. The merchants would no longer be subject to disappointment in sending forward their goods, the farmers and produce dealers in the interior would no longer be compelled to lose a season before realizing the value of their crops. The grazer would no longer be subject to loss in driving his stock to market, and the consumers and the packers would get better meat. Real estate in St. Louis generally would be greatly enhanced in value, as it would, likewise, along the entire route and within a day's journey of it, and in some places its value would be increased a thousand fold. New towns would spring up in the interior, and all the tillable lands along the route would be brought into cultivation. There would not be a farmer in any of the counties through which the road should be located, but would feel its benefits in the enhanced value of his property and productive industry of every kind. Transportation would be reduced to certainty and punctuality, the cost of insurance would be lessened, and the celerity of transit would be greatly increased. The aggregate wealth of the State would be much augmented, and its revenues and those of the counties upon the line of the road would from larger assessed values, experience proportionate improvement.

There is another view of the matter which seems to be as important as any we have taken. This is, as to the probable effect of such a State work, in determining the eastern termination, or beginning rather, of the great road to the Pacific, which is contemplated by the people and government of the United States. All know that there are numerous schemes afloat relative to the route and construction of that road; that several of these schemes are for a northern route, still more for a southern route, and but one or two perhaps for the central route, or that of the latitude of St. Louis. The executive department of the government, not committing itself to any scheme, contented itself with a recommendation of a survey, simply, of all the routes. It is quite possible that such a survey may be ordered by Congress. But if the Topographical Bureau should be authorized to make the survey, it will probably require some new light, some unexpected discovery of an unknown pass or some other powerful influence, to persuade it to report favorably upon any other route than that which follows the Gila along the borders of Mexico, passing at times, probably, into the Mexican territory, and connecting the lower Mississippi with the lower part of upper California. That report, however, must undergo the ordeal of Congress; and if it should appear that a route as favorable as any for the construction of the road, which shall admit of the saving of several hundred miles of distance and expense, is to be found, what but the most unjustifiable spirit of jealousy and selfishness could prevent its adoption. It is, however, by no means certain, amid the discontented spirits of Congress, that anything will be done in regard to the national project; or, if surveys are ordered, it will still be doubtful whether anything more would be done by the national authorities. The surveys themselves would occupy one or two, perhaps three or four years. To wait upon Congress until this lapse of time for the survey, and then still to wait upon Congress merely to discover whether they would make the road or not, would be to expose our own fate to be sealed, in the meantime, by the movements of State enterprises around us. We should see the interests of the upper counties attaching themselves to the St. Joseph and Hannibal railroad, and arranging themselves in reference to it, like the lines formed by the grains of sand attracted by the magnet. You might see the Illinois system, so far as it opposed to St. Louis, completed, and perhaps some southern cross railroads striking the Mississippi near the mouth of the Ohio. Blocked up in front, cut off above and below, and a perfect state of torpidity in the rear, how could we expect to accomplish anything more, if we were even able to save ourselves from retrogression? In either view, therefore, of the national project, whether that be carried out or not, I can see no benefit to accrue to us by delay or "masterly inactivity," while I feel profoundly convinced that great good will ensue to us if we act promptly and efficiently for ourselves.

COLUMBUS, OHIO, Railroad Car Manufacturing. RIDGWAYS & KIMBALL,

HAVE established at this central point, the manufacture of Passenger, Freight, Gravel and Hand Cars for Railroads, and assure all Western Railroad Companies that it will be their constant aim to procure the best materials and workmen, and to turn out the best kind of work at fair prices. Specimens may be seen on the Columbus and Xenia Railroad. The patronage of Railroad Companies is respectfully solicited.

1y8

Ogden & Martin's ROSENDALE CEMENT.

WE are prepared to enter into arrangements for supplying our Cement for public works or other purposes. We warrant the cement equal in every respect to any manufactured in this country. It attains a great degree of hardness, sets immediately under water, and is a superior article for masonry coming in contact with water, or requiring great strength.

For sale in tight barrels, well papered, at their office by
OGDEN & MARTIN, 104 Wall st.

February 16, 1850.

1y*

The above cement is used in most of the fortifications building by government.

Railroad Iron Wanted.

VIRGINIA AND TENNESSEE R.R. OFFICE, }
Lynchburg, January 25, 1850. }

PROPOSALS will be received at this office, until the 1st of March next, for the delivery in Lynchburg, of iron rails for the Virginia and Tennessee Railroad, to be manufactured in or near this town, of Virginia Iron.

The said iron to be made of the best pig metal, and to be delivered at the following times and in the following quantities, viz: six thousand tons in the year 1851, and the remainder (about 15,000 tons) for the whole road, equally in the years 1852 and 1853.

Separate proposals will also be received for the delivery in Lynchburg, of pig metal, at times and in quantities sufficient for the manufacture of the rails above mentioned, said delivery to commence as early as the 1st of November, 1850.

The rails and pig metal will be subjected to strict inspection—the rails are to weigh about 60 lbs per yard.

At the same time proposals will be received for the above quantity of iron, manufactured any where else in America, or in England, to be delivered in Lynchburg or Richmond, under the same general conditions as those prescribed for Virginia Iron, manufactured at Lynchburg. Satisfactory security will be required.

By order of the Board of Directors.

CHAS. F. M. GARNETT,
Chief Engineer.

NOTICE TO

Superintendents of Railroads.

TYLER'S PATENT SAFETY SWITCH.—The undersigned would respectfully call their attention to his Patent Safety Switch, which from long trial and late severe tests has proved itself perfectly reliable for the purpose for which it was intended. It is designed to prevent the train from running off when the switch is set to the wrong track by design or accident. The single rail or gate switch is established as the best and safest switch for the ordinary purpose of shifting cars from one track to another, but it is liable to the serious evil of having one track open or broken when connected with the other. My improvement entirely removes this evil, and while it accomplishes this important office, leaves the switch in its original simplicity and perfection of a plain unbroken rail, connecting one track with the other ready for use.

The following decision of the Commissioner of Patents is respectfully submitted to Railroad Engineers, Superintendents, and all others interested in the subject.

P. B. TYLER.

(COPY.)

UNITED STATES PATENT OFFICE, }

Washington City, D.C., April 28th, 1846. }

Sir: You are hereby informed that in the case of the interference between your claims and those of Gustavus A. Nicolls, for improvements in safety switches—upon which a hearing was appointed to take place on the 3d Monday in March, 1846, the question of priority of invention has been decided in your favor. Inclosed is a copy of the decision. The testimony in the case is now open to the inspection of those concerned.

Yours respectfully,
EDMUND BURKE,
Commissioner of Patents.

To Philos B. Tyler.

Any further information may be obtained by addressing
P. B. TYLER, Springfield, Mass., or JOHN
PENDLETON, Agent, 149 Hudson St., New York.

3,000 Tons Railroad Iron.

THE UNDERSIGNED IS PREPARED TO contract for the delivery of the above quantity at any port of the United States. Can be made of any required pattern and of a favorite brand.

lm3

CHARLES ILLIUS,
20 Beaver St., New York.

Brown's Old Established SCALE WARE HOUSE, NO. 234 WATER ST., NEW YORK.

THE Subscriber, Practical Manufacturer of Scales of every description, respectfully asks the attention of Railroad Companies to his Improved Wrought Iron Railroad Track and Depot Scales which for strength, durability, accuracy, convenience in weighing, and beauty of workmanship, are not surpassed by any others in this country.

He is aware that this is rather a bold assertion for him to make, yet he can say with confidence that they have but to be tried to give them precedence over all others.

J. L. BROWN.

Bank Scales made to order, and all Scales of his make Warranted in every particular.

References given if required.

4tl

BALL & CO'S PATENT Indestructible Water Pipe.

We publish below the opinions of others who have a personal knowledge of our Pipe, and would request all persons interested in the conveyance of water to investigate its merits for themselves. It being cheaper than Cast Iron pipes, and incomparably more durable (as there is no chance to commence decay but continually grows more permanent) it must supersede it altogether in works requiring durability and purity.—Branching, taping, altering or relaying is done with the greatest facility, and certainty, without injury, in any size of bore from 3 feet diameter down to that of an inch under any head that can be controlled with hose or service pipes.

J. BALL & CO.

Corner of Read and Centre Sts., N. Y.

FOR the benefit of those who have requested information in regard to this excellent article, we insert the following testimonials in relation to its merits:

"In answer to the numerous inquiries in relation to J. Ball & Co's Indestructible Water pipe, composed of iron and cement and in use in our village, the undersigned, water commissioners, trustees, and late trustees of the village of Saratoga Springs, take this method of saying that we have perfect confidence in the utility, goodness and durability of said pipe. The village of Saratoga Springs has some 20,000 feet of this pipe, varying from 6 to 14 in. in diameter, under a head of about 90 feet. It has been laid since the fall of 1846. Since it was fully completed, it has cost comparatively nothing to keep it in repair; and, although some portions are exposed to the frost, it seems to stand well the test, and answer all the purposes for which it was designed and constructed. We believe it preferable to iron pipe—is much cheaper and more durable, and we would not exchange it for any other kind of pipe yet invented, if we could without any additional expense or inconvenience. The water comes through clear and pure, and where we have had occasion to take any part of it up to improve or alter the grounds, it appeared to be just as sound and imperishable as the moment it was laid down. This testimony is entirely disinterested, and is now given to avoid the necessity of answering the many calls upon us for information on this subject. We have witnessed and many of us have superintended the laying down of the pipe in this village, and watched its operations since, and are perfectly satisfied that we have the best water pipe ever presented to the public. Saratoga Springs, Dec., '49.

G. M. Davidson, }
R. Putnam, } Water Com.
N. B. Doe, }
R. Gardner, }
H. P. Hyde, }
J. L. Perry, } Trustees.
J. D. Briggs, }
S. Chapman, }
J. A. Corey, } Late Trustees.
W. S. Alger, }
Wm. Cook, }

"I certify that I was Chief Engineer, having the construction of the above work in charge, and fully concur in the foregoing statement. Dec., 1849.

S. R. OSTENDER, Civil Engineer."

A card, signed by the Trustees or Water Commissioners of Saratoga Spa (village), expressing their unqualified approval of J. Ball & Co's indestructible water pipe, has been shown me; whilst I fully endorse from my own experience, the statements of these gen-

lemen, I am enabled to add that under my direction, some six thousand feet of cement pipe was laid by Messrs. Ball & Co., in this village, that the main pipe was of 10, 4 and 6 inches bore, and is subjected to a pressure due to an average head of sixty-five feet—it has fully answered my expectations. I would further state that, having been employed by the Common Council of Albany to report a plan of supplying that city with water, I had occasion very carefully to test the merits of this kind of pipe, and was so fully convinced of the practicability of using the cement pipe for large conduits, being of three feet in diameter, as well as for smaller ones, that I recommended its adoption in the proposed work, and give my reasons for so doing.

1st. That the cement pipe is far less expensive than that of cast iron or brick.

2d. That it will sustain an equal pressure with that of cast iron; and when used for large conduits, can be carried up and down the inequalities of the surface of the ground, saving the grading, which is indispensable if a brick one is used.

3d. That it can be readily and economically repaired, and, should it become necessary, can be taken up and relaid without injuring the pipe.

4th. That this description of pipe is not so much affected by frost as one of metal, and in no way impairs the quality of the water.

F. S. CLAXTON,

Engineer and Ag't Cohoes Co.

Messrs. J. Ball & Co., New York.

Cohoes, December 31, 1849.

In addition to the above testimonials, we can state that, having had experience and personal knowledge in regard to the excellent qualities and durability of the above pipe, we have no hesitation in recommending it to the public.

Starr & Alburts, 122 Nassau st.

Frederick Marquand, per H. G. M., Atty.

Janca, Beebe & Co.

H. W. Metcalf, 63 and 65 Centre st.

Norman White, 111 Fulton st.

John J. Merritt, No. 76 Columbia st. Brooklyn.

Platt & Brother, 20 Maiden Lane.

Geo. Griswold, South st.

J. & J. W. Meeks, 14, 16 and 18 Vesey st.

Wm. Gale, 116 Fulton st.

J. C. Brown, Builder, 10 Dutch st.

Wm. Colgate & Co.

Thos. C. Smith.

O. R. Burnham, 17 and 19 Broadway.

G. B. Harrison, 58 and 60 Vesey st.

Wm. W. Campbell, 77 St. Mark's Place.

Lorin Brooks, 240 Broadway.

Messrs. J. Ball & Co.:

Gents: Articles have appeared in the Farmer and Mechanic, from Saratoga and Cohoes, on the subject of your water pipes; I fully endorse their opinions. Your work for my son's water cure at South Orange, embracing a large amount of four and three inch pipe, under a head at least as great as the Croton of New York, shows not only certainty and efficiency, but what is equally important, perfect purity, which for medical purposes is all important, and should be considered so for drinking and other uses.

Yours, SAML. MEEKER.

Newark, January 11, 1850.

In addition to the above, we certify that J. Ball & Co. have inserted pipes for us of 10 inch bore and less, since the winter of 1844, and that last Spring we had over 1000 lbs. of lead pipe removed, and its place supplied with their pipe. We fully endorse the opinions expressed in the notices above.

BEACH, BROTHERS,

New York Sun Establishment.

Having for the past three years laid many of Messrs J. Ball & Co's patent cement pipes in the Newark Aqueduct Co., I prefer them to any pipe that I have used, their cost being one-third less than iron pipe, and also being free from wear and rust, and can most cordially recommend them for all aqueduct purposes.

SHELDON SMITH, Superintendent.

Newark, January 14, 1850.

THE NEWCASTLE MANUFACTURING Co. continue to furnish at the Works, situated in the town of Newcastle, Del., Locomotive and other steam engines, Jack Screws, Wrought Iron Work and Brass and Iron Castings, of all kinds connected with Steamboats, Railroads, etc.; Mill Gearing of every description; Cast Wheels (chilled) of any pattern and size, with Axles fitted, also with wrought tires, Springs, Boxes and bolts for Cars; Driving and other wheels for Locomotives.

The works being on an extensive scale, all orders will be executed with promptness and despatch. Communications addressed to Mr. William H. Dobbs, Superintendent, will meet with immediate attention.

ANDREW C. GRAY,
President of the Newcastle Manuf. Co.

Great American Mechanical Work.

PUBLISHING MONTHLY BY SUBSCRIPTION

SPECIMENS OF THE STONE, IRON, AND WOOD BRIDGES, VIADUCTS, TUNNELS, CULVERTS, &c., of the United States Railroads, illustrated by a Series of Drawings, from actual measurement of the works, including Plans, Elevations, Sections and details of each Structure, accompanied by remarks on the relative merits of the various forms of construction adopted, as regards economy, strength and durability, with Specifications, Estimates, Bills of Timber, Iron, etc., of the several structures: and an APPENDIX, illustrative of the art of Bridge Building as at present practised in Europe; and numerous original Designs for Bridges, Viaducts, Culverts, etc.; the whole calculated to meet the exigencies of Engineers, and assist Draftsmen, Bridge Builders, Mechanics and Students.

BY GEORGE DUGGAN,
ARCHITECT AND CIVIL ENGINEER.

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The FIRST or AMERICAN DIVISION of this important work will be completed in about Twelve Parts, and the APPENDIX in about Eight Parts, each part containing Two double or Four single large folio plates, accompanied by appropriate letter press descriptions, Specifications, Estimates of the cost, Bills of Timber, Iron, &c. of each structure, presenting at a glance the comparative merits, as regards economy, strength, and durability of the various modes of Bridge construction at present practised by the most eminent Engineers in the United States.

The Engraving has been entrusted to first rate artists, and is executing in a manner that cannot fail to give satisfaction, while the price (Seventy-five cents a Month) is such as will place it within the reach of all who take an interest in our great mechanical contrivances.

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Engineers in charge of Railroad Works, are respectfully requested to send Drawings of their Drawings of Bridges, &c., with the Specifications, Bills of Timber, Iron, &c., to GEORGE DUGGAN at his residence No. 179 Henry Street, New York, with a view to their insertion in this work.

Great American Mechanical Work.

D. APPLETON & CO. PUBLISHERS. This Week, No. 2, with numerous illustrations, price 25 cts. A DICTIONARY OF MACHINES, MECHANICS, ENGINE WORK AND ENGINEERING; designed for practical working men, and those intended for the engineering profession. Edited by Oliver Byrne. To be completed in about 40 Nos. Price 25 cents each.

This will be the most practical, as well as the most perfect work ever published on Machines, Mechanics, Engine work and Engineering. The Mechanic, Engineer or Machinist, from the time he commences his profession till he arrives at the zenith of the most successful professional career, will find this an indispensable work of reference.

This volume will be of royal 8vo. size, containing nearly 2,000 pages, 1500 plates, and 6,000 cuts; it will fill up a chasm that has long been a requirement to practical working men, and those intended for the engineering profession. It will present Working Drawings and descriptions of every important machine in practical use in the United States, and independent of its American value as embracing the results of American ingenuity, it will contain a complete treatise on Mechanics, Machinery, Engine work, and the substance of at least a thousand dollars worth of books scattered in expensive folio volumes or magazines.

* * * Heads of Subjects and Illustrations Comprised in this No.—Archimedian Screw Propeller, Artesian Well of Grenelle, Augers, Auger Machine, Automatic Diving Machine, Axles, Belting Machine, Belting, Biram's Tell Tale, Basting under Water, Blast Furnaces, Blasting, Block Machinery, Blocks, etc.

No. 3 will be published next week, containing 176 plates.

AGENTS WANTED.

Several responsible and active men are wanted as Agents to procure subscribers for the above valuable work. Subscribers may readily be obtained in every city and village of the American continent. A liberal commission allowed. Apply to the Publishers, 200 Broadway.

NOTICE.

TO BRIDGE BUILDERS, BRIDGE COMPANIES, and Other Individuals and Associations, who have constructed or used Bridges involving the combined principle of *Bracing*, *Counter-bracing* and *Trussing* by means of counteracting braces, keys, wedges, screws, etc., as set forth and explained in my Bridge Patent of 1830, in the words following, to wit: "A system of Counter-bracing, by means of which the truss frames are rendered stiff and unyielding, and the bridge kept in uniform action whether loaded or unloaded"—NOTICE is hereby given, that in all cases in which said combined principle has been introduced into bridges, without due license or authority from me, and without my having been duly remunerated therefor, will be regarded as infringements upon my rights and privileges, and that an amicable adjustment and settlement of all my claims in the premises may be effected by prompt application to my duly authorized Agents therefor, viz: Messrs. Clinton, Knight and Brother, of Cincinnati, Ohio, or Daniel A. Webster, Esq., 8 Pell street of the city of New York.

STEPHEN H. LONG, Patentee.

Louisville, December 10, 1849

FARMERS! ATTENTION!!

John Mayher & Co's
NEW AGRICULTURAL WAREHOUSE
AND SEED STORE.

197 WATER STREET, NEW YORK.

Where they have for Sale, the largest and most complete assortment of Farming Implements, ever offered for sale in this city—all of which they will sell 10 per cent. Cheaper than the same kind of Goods can be bought at any other house in the city. Our Goods are all Warranted to give satisfaction.

FARMERS wanting to purchase, will please call and examine our Stock before buying elsewhere.

Among our assortment may be found the Celebrated Highest Premium Eagle Ploughs! together with all the most approved Ploughs now in use.

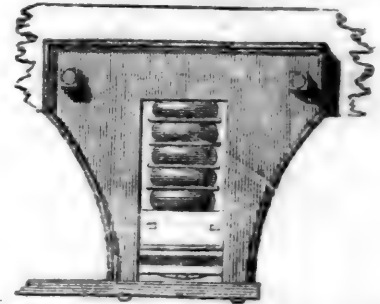
Also,—Horse Powers, Threshing Machines, Fan Mills, Corn Shellers, Straw Cutters, Corn Mills, Seed Sowers, Churns, Ox Yokes, Ox Scrapers, Hay Rakes, Horse Rakes, Patent Chain Pump (that never freezes nor rusts), and other Pumps; in fact we have everything for Farming Purposes—together with Guano, Bone Dust and other Fertilizers.

JOHN MAYHER & CO.,
197 Water st., N. Y.

February 9, 1850.

N.B.—J. M. & Co. also continue their Old Stand, at 195 Front street, near Fulton Market.

FULLER'S PATENT INDIA RUBBER SPRING.



THESE SPRINGS ARE THE CHEAPEST, the lightest and most durable of any yet known. They are easily applied to new or old cars, and there is small possibility of any accident occurring to them.

Other parties through Mr. Ray set up claims to an India Rubber Spring which, though the same in principle, is very inferior in its working and durability. Actions are in progress for an Infringement on Fuller's Patent against parties using that Spring.

The superiority of Fuller's Spring over that claimed by Mr. Ray is fully established and has frequently been testified to. The following are from gentlemen who have had much experience with both Springs.

"It will afford me pleasure to recommend your springs to the companies in this region, in preference to Ray's which I am confident are inferior in mechanical arrangement to yours."

JOHN M'RAE,

Engineer S. Carolina R. R., Charleston.

"I do not hesitate to allow you to say that I concur in Mr. M' Rae's opinion that Ray's springs are inferior in mechanical arrangement to Fuller's. I repeatedly expressed that opinion long before Mr. M' Rae had seen your springs (as I believe) and entertain it still."

WM. PARKER,

Gen'l Supt. of Baltimore and Ohio R. R.

Office of Sup't Norwich & Worcester R.R. Co.,
December 26, 1849.

"I most fully concur in the opinion of Jno. McRae, Engineer of S. Carolina Railroad, that 'Rays Springs are inferior to Fuller's Springs,' and shall with pleasure recommend them to all Railroad Companies for adoption. I have used both springs on this road and have no hesitation in saying that I should in all cases prefer Fuller's Spring."

SAM'L H. P. LEE, JR.,
Supt and Engineer.

Office B. & P. R. R. Co.,
Boston, 20th December, 1849.

"This company have cars fitted up with both Ray's and Fuller's 'Metallic India Rubber Springs,' and I do not hesitate to say that Fuller's arrangement is very much superior to Ray's."

W. RAYMOND LEE, Supt.

The following result has been obtained by experiment upon one railroad.

A set of Trucks fitted with Steel Springs cost \$190-77 and weigh 2355 lbs.	
The same with Fuller's Springs,	131-71 " 1911 lbs.
Difference,	\$59-06 " 444 lbs.

Not only is there an advantage in the cost, but owing to the great reduction in weight, the car can be made lighter throughout, and so an enormous saving in weight may be effected in a Train.

G. M. KNEVITT, 38 Broadway, N. Y.,
General Agent for the U. S.

The Springs can also be had of
JAMES LEE & CO., 18 India Wharf, Boston, &
JAS. THORNLEY, 110 Chestnut St., Philad.
January 2, 1850.

Railroad Iron.

2,000 Tons Heavy Rails, 57 and 61 lbs. per lineal yard, in store, and to arrive, within 30 days.

500 Tons 2½ x ¼ inch flat Rails.

1000 Tons 56 lbs. per lineal yard.

For sale by - DAVIS, BROOKS & CO.,
No. 68 Broad street.

February 2, 1850.

LIST NO. 1, [To be Continued.]

Engineering, Railways, Machinery, Steam Engines, etc.

JOHN WILEY, 161 BROADWAY NEW YORK,
has on hand and for sale the following Works on the above subjects:

SCOTT, (D.) The Engineer and Machinists' Assistant, being a Series of Plans, Sections and Elevations of Steam Engines, Spinning Machines, Mills for Grinding Tools, etc., taken from Machinists of approved construction at present in operation, 2 volumes folio, one of letter press, the other plates, half bound in Russia, \$18 00.

TREDGOLD, (T.) The Steam Engine, its Invention and Progressive Improvement, an Investigation of its Principles and its Application to Navigation, Manufactures and Railways, a new and revised edition with considerable additions, including enlarged Examples of Locomotive Engines for Railways, Marine Engines for Sea, River and Canal service, with the Construction of Steam Vessels, Stationary Engines employed for all kinds of Manufacturing purposes, Engines employed in Mines for Raising Water, or for supplying Towns with Water, Cornish Pumping Engine, Engines for Mill Work, Flour Mills, etc., High Pressure and Non-condensing Engines, issued Monthly, 15 parts are published at 75 cents each.

BUCHANAN, (R.) Practical Essays on Mill Work and other Machinery, 70 plates, 2 vols \$14 00. Supplement to do., 1 vol., 5 00.

BRIDGES, The Theory, Practice and Architecture of Bridges of Stone, Iron, Timber and Wire, 3 vols. royal, 8mo, half Morocco, 138 Engravings and 92 Wood cuts, \$25 00.

DUGGAN, (G.) Specimens of the Stone, Iron and Wood Bridges, Viaducts, Tunnels, Culverts, etc., of the United States Railroads, part I now ready, to be completed in about twelve monthly parts at 75 cents each.

FAIRBAIRN, (W.) The Conway and Britannia Tubular Bridges, together with an Experimental Investigation on Hollow Beams Constructed of Wrought Iron, illustrated with numerous engravings, 1 vol. royal 8vo, \$11 50.

AMERICAN LOCOMOTIVES, being a Treatise on the Theory of Steam, and its Application to Locomotive Engines, illustrated by 42 Elegant and Accurate Engravings of the most approved American Locomotives, and accompanied by full and clear explanations, designed for the use of Students, Builders and Working Engineers, by Emil Renter. The work will be completed in 16 monthly numbers, 5 numbers are now published, at 75 cts. each number. For sale by

JOHN WILEY,
Publisher and Importer,
161 Broadway, New York.

ENGINEERS.

Arrowsmith, A. T.,
Buckfield Branch Railroad, Buckfield, Me.

Banks, C. W.,
Civil Engineer, Vicksburg, Miss.

Berrien, John M.,
Michigan Central Railroad, Marshall, Mich.

Buckland, George,
Troy and Greenbush Railroad.

Clement, Wm. H.,
Little Miami Railroad, Cincinnati, Ohio.

Cozzens, W. H.,
Engineer and Surveyor, St. Louis, Mo.

Davidson, M. O.,
Eckhart Mines, Alleghany Co., Maryland.

Fisk, Charles B.,
Cumberland and Ohio Canal, Washington, D. C.

Felton, S. M.,
Fitchburgh Railroad, Boston, Mass.

Floyd-Jones, Charles,
South Oyster Bay, L. I.

Gzowski, Mr.,
St. Lawrence & Atlantic Railroad, Montreal, Canada.

Gilbert, Wm. B.,
Rutland and Burlington Railroad, Rutland, Vt.

Grant, James H.,
Nashville and Chattanooga R. R., Nashville, Tenn.

Harry, P.,
Binghamton, New York.

Holcomb, F. P.,
Southwestern Railroad, Macon, Ga.

Higgins, B.,
Mansfield and Sandusky Railroad, Sandusky City, O.

Johnson, Edwin F.,
New York and Boston Railroad, Middletown Ct.

Latrobe, B. H.,
Baltimore and Ohio Railroad, Baltimore, Md.

Miller, J. F.,
Worcester and Nashua Railroad, Worcester, Mass.

Morris, Elwood,
Schuylkill Navigation, Schuylkill Haven, Pa.

Morton, A. C.,
Atlantic and St. Lawrence Railroad, Portland, Me.

McRae, John,
South Carolina Railroad, Charleston, S. C.

Nott, Samuel,
Lawrence and Manchester Railroad, Boston.

Prichard, M. B.,
East Tennessee and Georgia R. R., Cleveland, Tenn.

Reynolds, L. O.,
Central Railroad, Savannah, Ga.

Roebbling, John A.,
Trenton, N. J.

Roberts, Solomon W.,
Ohio and Pennsylvania Railroad, Pittsburgh, Pa.

Robinson, James P.,
Androscoggin & Kennebec Railroad, Waterville, Me.

Sanford, C. O.,
South Side Railroad, Virginia.

Schlatter, Charles L.,
Northern Railroad (Ogdensburg), Malone, N. Y.

Sours, Peter,
Dauphin and Susquehanna Coal Co., Dauphin, Pa.

Stark, George.,
Bost., Con. and Mont. R. R., Meredith Bridge, N. H.

Steele, J. Dutton,
Pottstown, Pa.

Trimble, Isaac R.,
Philad., Wil. & Baltimore Railroad, Wilmington, Del.

Tinkham, A. W.,
United States Fort, Bucksport, Me.

Thomson, J. Edgar.,
Pennsylvania (Central) Railroad, Philadelphia.

Whipple, S.,
Civil Engineer and Bridge Builder, Utica, N. Y.

Williams, E. P.,
Auburn and Schenectady Railroad, Auburn, N. Y.

Williams, Charles H.,
Milwaukee, Wisconsin.

Wormeley, Preble,
Central Ohio Railroad, Zanesville, Ohio.

HOTELS.

JONES' HOTEL,
NO. 152 CHESTNUT STREET,
PHILADELPHIA.
BRIDGES & WEST, Proprietors.

DUNLAP'S HOTEL,
On the European Plan,
NO. 135 FULTON STREET,
Between Broadway and Nassau St.,
NEW YORK.

BUSINESS CARDS.

Nathan Caswell,
METAL BROKER, 69 WALL ST., N. Y.
For the Purchase and Sale of Railroad Iron (new and old), Boiler Plates, Pig and Bar Iron, Lead, Tin, Copper, Spelter, etc. Refers to
Messrs. Boorman, Johnston, & Co., New York.
" Grinnell, Mintum & Co., "
" Barston, Pope & Co., "
" Earps & Brink, Philadelphia.
" E. Pratt & Brother, Baltimore.
John Barstow, Esq., Providence.
Lewis Bullard, Esq., Boston.
February 9, 1850. 6m*

VanRensselaer Stevens,
Sup't Transportation Providence and Worcester R.R., Providence, R.I. Has had 11 years' experience in Operating Railroads. Will go South or West if applied to.

J. & Riley Carr,
Manufacturers of Cast, Shear, German and Blister
STEEL,
Of all Descriptions, Warranted Good.
BAILEY-LANE WORKS, SHEFFIELD.

R. S. DENTON, Agent,
NO. 20 CLIFF ST., NEW YORK.

STEEL AND FILES.
R. S. Denton,
20 CLIFF STREET, NEW YORK,

AGENT FOR
J. & Riley Carr's
BAILEY-LANE WORKS, SHEFFIELD,
Manufacturers of Cast, Shear, German and Blister
STEEL
Of all descriptions. Warranted Good

FILES.
Manufacturers of Machinists' Warranted Best Cast Steel Files, expressly for working upon Iron and Steel, made very heavy for recutting.
A full Stock of Steel and Files at all times on hand. 6m4

Cumberland, (Md.) Coals for Steaming, etc.
ORDERS RECEIVED FOR AND FILLED
by J. COWLES, 37 Wall St., N. Y.

George O. Robertson,
BROKER IN SCOTCH AND AMERICAN PIG IRON;
Bar Iron, Lead, Spelter, Tin, Copper, etc.,
No. 4 Liberty Place, MAIDEN LANE,
(Near Broadway.)
NEW YORK

Manufacture of Patent Wire ROPE AND CABLES,
For Inclined Planes, Suspension Bridges, Standing Rigging, Mines, Cranes, Derrick, Tilters, &c., by
JOHN A. ROEBLING, Civil Engineer,
TRENTON, N. J.

Samuel D. Willmott,
MERCHANT, AND MANUFACTURER OF
CAST STEEL WARRANTED SAWS,
IMPORTER OF THE
GENUINE WICKESLY GRINDSTONES,
NO. 9 LIBERTY STREET,
NEW YORK.

Doremus & Harris,
ANALYTICAL & CONSULTING CHEMISTS,
179 BROADWAY, NEW YORK.
SCHOOL OF CHEMISTRY.

Dudley B. Fuller & Co.,
IRON COMMISSION MERCHANTS,
No. 139 GREENWICH STREET,
NEW YORK.

Manning & Lee,
GENERAL COMMISSION MERCHANTS,
NO. 51 EXCHANGE PLACE,
BALTIMORE.
Agents for Avalon Railroad Iron and Nail Works.
Maryland Mining Company's Cumberland Coal 'CED'
—'Potomac' and other good brands of Pig Iron.

**Railroad Car Manufacturer's
Furnishing Store.****J. F. S. & S. A. MARTINE,**

IMPORTERS AND MANUFACTURERS OF

**RAILROAD CAR &
CARRIAGE LININGS,**PLUSHES, CURTAIN MATERIALS, ETC.,
112 WILLIAM ST., NEAR JOHN.3-4 and 6-4 Damasks, Union and Worsted; Mo-
reens, Rattinetta, Cloths, Silk and Cotton Velvets,
English Bunting**Walter R. Johnson,**CIVIL AND MINING ENGINEER AND AT-
torney for Patents. Office and Laboratory, F St.,
opposite the Patent office, Washington, D. C.**S. W. Hill,**Mining Engineer and Surveyor, Eagle River,
Lake Superior.**Starks & Pruyn,**MANUFACTURERS OF ALL KINDS OF
STEAM BOILERS,

52 and 54 Liberty, corner of Pruyn street

Nathan Starks, Special Partner
Wm. F. Pruyn, **ALBANY.** R. H. Pruyn.
Iron Railing, Bank and Vault Doors, Iron Shutters
Bridge and Roof Bolts, Heavy Jobbing and Forging
of all kinds.

For particulars see Adv. in another column.

To Engineers and Surveyors.E. BROWN AND SON Mathematical inst.
makers No. 27 Fulton Slip, New York, make and keep
for sale, Theodolites, Levelling inst., Levelling rods,
Surveyors Compasses, and Chains, Cases of Mathe-
matical drawing insts. various qualities, together with
a general assortment of Ivory Scales and small insts.
generally used by Engineers.**Samuel Kimter & Co.,
COMMISSION MERCHANTS**

WILLOW ST. WHARVES, PHILADELPHIA.

AGENTS for the sale of Charcoal and Anthracite
Pig Iron, Hammered Railroad Car and Locomo-
tive Axles, Force Pumps of the most approved con-
struction for Railroad Water Stations and Hydraulic
Rams, etc., etc.

July, 27, 1849.

James Herron, Civil Engineer,OF THE UNITED STATES NAVY YARD,
PENSACOLA, FLORIDA.,

PATENTEE OF THE

HERRON RAILWAY TRACK.Models of this Track, on the most improved plans,
may be seen at the Engineer's office of the New York
and Erie Railroad.**To Railroad Companies.**

—WROUGHT IRON WHEELS—

SAFETY AND ECONOMY.

**NORRIS' LOCOMOTIVE WORKS,
SCHENECTADY, NEW YORK,**Are Manufacturing Wrought Iron Driving, Truck,
Tender, and Car Wheels—made from the best Ameri-
can Iron. Address **E. S. NORRIS.**
May 16, 1849.**Machinery Warehouse.**S. C. HILLS, No. 43 Fulton street, New York, has
constantly for sale Steam Engines, Boilers, Lathes,
Chucks, Drills, Planers, Force and Suction Pumps;
Tenoning, Morticing and Boring Machines, Shingle
Machines, Bolt and Nut Machines, Belting, Oil, Iron
and Lead Pipe; Rubber, Percha and Leather Hose,
&c., &c.S. C. H.'s arrangements with several machine shops
are such that he can supply, at very short notice, large
quantities of machinery.

November 23, 1849.

Cruse & Burke,Civil Engineers, Architects and Surveyors,
Office, New York State Institution of Civil Engineers,
STATE HALL, ALBANY, N. Y.Drawings, specifications and surveys accurately ex-
ecuted. Pupils instructed theoretically and practical-
ly at a moderate premium.

May 26, 1849.

Eaton, Gilbert & Co.,Railroad Car, Coach and Omnibus Builders,
TROY, N. Y.**Hudson River Foundry,
THOMAS & COLLINS,**

130 Quay Street, Albany.

To Railroad & Navigation Cos.Mr. M. B. HAWSON, Civil Engineer, offers his
services to Companies about to carry out the survey-
or works of a line of Navigation or Railroad. He can
give satisfactory references in New York City as to his
professional qualifications; and will therefore merely
refer here to the fact of his having been engaged to,
upwards of two years conducting important Public
Works for the British Government.Communications will find Mr. Hawson at the office
of the Railroad Journal, 54 Wall Street, New York.**Alfred W. Craven,**

Chief Engineer Croton Aqueduct, New York.

Cop Waste.CLEAN COP WASTE, suitable for cleaning Rail-
road, Steam boat and Stationary Engines, con-
stantly on hand and for sale by**KENNEDY & GELSTON,**

51 Pine St., New York.

October 27, 1849,

3m

IRON.**Iron.**Pig Iron, Anthracite and Charcoal; Boiler and Flue
Iron, Spring and Blistered Steel, Nail Rods, Best Re-
fined Bar Iron, Railroad Iron, Car Axles, Nails, Stove
Castings, Cast Iron Pipes of all sizes, Railway Chairs
of approved patterns for sale by**COLEMAN, KELTON & CAMPBELL,**
109 N. Water St., Philadelphia.**IRONDALE PIG METAL, MANUFACTURED**and for sale by the Bloomsburg Railroad Iron Co.
DUDLEY FISHER, Treasurer.

75 N. Water St., Philadelphia.

Railroad Iron.500 Tons, about, weighing 57 pounds per lineal
yard, for sale by**COLLINS, VOSE & CO.,**

158 South St.

New York, November 17, 1849.

1m46

Railroad Iron.THE Undersigned, Agents for Manufacturers, are
prepared to contract to deliver Rails of superior
quality, and of any size or pattern, to any ports of dis-
charge in the United States.**COLLINS, VOSE & CO.,**

158 South St.

New York, November 17, 1849.

Railroad Iron.

1600 Tons, weighing 60 1/2 lbs. per yard.

185 " " 57 1/2 "

580 " " 53 "

of the latest and most approved patterns. For sale by
BOORMAN, JOHNSTON & CO.,

119 Greenwich street.

New York, Oct. 13, 1849.

Railroad Iron.THE Undersigned have on hand, ready for immedi-
ate delivery, various patterns of Iron Rails, of
best English make, and manufactured in conformity
with special specifications.They offer also to import and contract to deliver
ahead—on favorable terms.**DAVIS, BROOKS, & CO.,**

68 Broad street.

New York, Oct. 11, 1849.

Drawings and Patterns of the most approved
Rail—and specifications of quality and make of same,
are on hand at their office, for examination of parties
who may desire to inspect the same. **D., B. & Co.**
Oct. 11, 1849.**CUT NAILS OF BEST QUALITY, BAR IRON**(including Flat Rails) manufactured and for sale
by **FISHER, MORGAN & CO.,**
75 N. Water St., Philadelphia.**Glendon Refined Iron.**Round Iron, Band Iron, Hoop Iron,
Squares, Flat, ScrollAxles, Locomotive Tyres,
Manufactured at the Glendon Mills, East Boston, for
sale by **GEORGE GARDNER & CO.,**
5 Liberty Square, Boston, Mass.
Sept. 15, 1849. 3m37**PATENT HAMMERED RAILROAD, SHIP &
BOAT SPIKES.**—The Albany Iron Works
have always on hand, of their own manufacture, a
large assortment of Railroad, Ship and Boat Spikes
from 2 to 12 inches in length, and of any form of head.
From the excellence of the material always used in
their manufacture, and their very general use for rail-
roads and other purposes in this country, the manu-
facturers have no hesitation in warranting them fully
equal to the best spikes in market, both as to quality
and appearance. All orders addressed to the subscrib-
ers at the works will be promptly executed.**JOHN F. WINSLOW, Agent.**Albany Iron and Nail Works, Troy, N. Y.
The above Spikes are sold at first prices, by
Erastus Corning & Co. Albany; Merrill & Co., New
York; E. Pratt & Br. 101 E. Street, Md**LAP—WELDED
WROUGHT IRON TUBES**

FOR

TUBULAR BOILERS,

FROM 1 1/2 TO 8 INCHES DIAMETER.

These are the ONLY Tubes of the same quality
and manufacture as those so extensively used in
England, Scotland, France and Germany, for Lo-
comotive, Marine and other Steam Engine Boilers.**THOMAS PROSSER,**

Patentee.

28 Platt street, New York

Railroad Iron.THE UNDERSIGNED ARE PREPARED TO
contract for the delivery of English Railroad Iron
of favorite brands, during the Spring. They also re-
ceive orders for the importation of Pig, Bar, Sheet, etc.
Iron.**THOMAS R. SANDS & CO.,**

22 South William street,

February 3, 1849.

New York.

Iron Store.THE Subscribers, having the selling agency of the
following named Rolling Mills, viz: Norristown,
Rough and Ready, Kensington, Philadelphia, Potte-
grove and Thorndale, can supply Railroad Companies,
Merchants and others, at the wholesale mill prices for
bars of all sizes, sheets cut to order as large as 58 in.
diameter; Railroad Iron, domestic and foreign; Locomo-
tive tire welded to given size; Chairs and Spikes;
Iron for shafting, locomotive and general machine-
purposes; Cast, Shear, Blister and Spring Steel; Bol-
ter rivets; Copper; Pig iron, etc., etc.**MORRIS, JONES & CO.,**

Iron Merchants,

Schuylkill 7th and Market Sts., Philadelphia.
August 16, 1849. 1y33**Railroad Iron.**THE MOUNT SAVAGE IRON WORKS, AL-
legany county, Maryland, having recently passed
into the hands of new proprietors, are now prepar-
ed, with increased facilities, to execute orders for any
of the various patterns of Railroad Iron. Communi-
cations addressed to either of the subscribers will have
prompt attention. **J. F. WINSLOW, President**

Troy, N. Y.

ERASTUS CORNING, Albany**WARREN DELANO, Jr., N. Y.****JOHN M. FORBES, Boston.****ENOCH PRATT, Baltimore, Md.**

November 6, 1849.

Railroad Iron.THE SUBSCRIBERS ARE PREPARED TO
take orders for Railroad Iron to be made at the
Phoenix Iron Works, situated on the Schuylkill Riv-
er, near this city, and at their Safe Harbor Iron Works,
situated in Lancaster County, on the Susquehanna
river; which two establishments are now turning out
upwards of 1500 tons of finished rails per month.
Companies desirous of contracting will be promptly
supplied with rails of any required pattern, and of the
very best quality.**REEVES, BUCK & CO.,**

45 North Water St., Philadelphia,

March 15, 1849.

Monument Foundry.

A. & W. DENMEAD & SON,
Corner of North and Monument Sts.,—Baltimore.

HAVING THEIR

IRON FOUNDRY AND MACHINE SHOP

In complete operation, are prepared to execute faithfully and promptly, orders for

Locomotive or Stationary Steam Engines,
Woolen, Cotton, Flour, Rice, Sugar Grist, or Saw Mills,

Slide, Hand or Chuck Lathes,
Machinery for cutting all kinds of Gearing.

Hydraulic, Tobacco and other Presses,
Car and Locomotive patent Ring Wheels, warranted,

Bridge and Mill Castings of every description,
Gas and Water Pipes of all sizes, warranted,
Railroad Wheels with best faggotted axle, furnished and fitted up for use, complete

Being provided with Heavy Lathes for Boring and Turning Screws, Cylinders, etc., we can furnish them of any pitch, length or pattern.

Old Machinery Renewed or Repaired—and Estimates for Work in any part of the United States furnished at short notice.

June 8, 1849.

Iron Wire.

REFINED IRON WIRE OF ALL KINDS,
Card, Reed, Cotton-flyer, Annealed, Broom, Buckle, and Spring Wire. Also all kinds of Round, Flat or Oval Wire, best adapted to various machine purposes, annealed and tempered, straightened and cut any length, manufactured and sold by

ICHABOD WASHBURN.

Worcester, Mass., May 25, 1849.

American and Foreign Iron.

FOR SALE,

300 Tons A 1, Iron Dale Foundry Iron.
100 " 1, " " " "
100 " 2, " " " "
100 " " Forge " "
400 " Wilkesbarre " "
100 " "Roaring Ran" Foundry Iron.
300 " Fort " "
50 " Catocin " "
250 " Chikiswalongo " "
50 " "Columbia" "chilling" iron, a very superior article for car wheels.
75 " "Columbia" refined boiler blooms.
30 " 1 x 1/2 Slit iron.
50 " Best Penna. boiler iron.
50 " "Puddled" " "
50 " Bagnall & Sons refined bar iron.
50 " Common bar iron.

Locomotive and other boiler iron furnished to order.

GOODHUE & CO.,

New York. 64 South street

American Pig, Bloom and Boiler Iron.

HENRY THOMPSON & SON,
No 57 South Gay St., Baltimore, Md.

Offer for sale. Hot Blast Charcoal Pig Iron made at the Catocin (Maryland), and Taylor (Virginia), Furnaces; Cold Blast Charcoal Pig Iron from the Cloverdale and Catawba, Va., Furnaces, suitable for Wheels or Machinery requiring extra strength; also Boiler and Flue Iron from the mills of Edge & Hilles in Delaware, and best quality Boiler Blooms made from Cold Blast Pig Iron at the Shenandoah Works, Va. The productions of the above establishments can always be had at the lowest market price for approved paper.

American Pig Iron of other brands, and Rolled and Hammered Bar Iron furnished at lowest prices. Agents for Watson's Perth Amboy Fire Bricks, and Rich & Cos. New York Salamander Iron Cheats.
Baltimore, June 14, 1849. 6 mos

LAP-WELDED WROUGHT IRON TUBES
for Tubular Boilers, from 1 1/2 to 15 inc. in diameter, and an length not exceeding 17 feet—manufactured by the Caledonian Tube Company, Glasgow, and for sale by
IRVING VAN WART,
12 Platt street, New York.

JOB CUTLER, Patentee.

These Tubes are extensively used by the British Government, and by the principal Engineers and Steam Marine and Railway Companies in the Kingdom.

Railroad Iron.

THE TRENTON IRON COMPANY ARE NOW turning out one thousand tons of rails per month, at their works at Trenton, N. J. They are prepared to enter into contract to furnish rails of any pattern, and of the very best quality, made exclusively from the famous Andover Iron. The position of the works on the Delaware river, the Delaware and Raritan canal, and the Camden and Amboy railroad, enables them to ship rails at all seasons of the year. Apply to

COOPER & HEWITT, Agents.

October 30, 1848. 17 Burling Slip, New York.

Pig and Bloom Iron.

THE SUBSCRIBERS ARE AGENTS for the sale of numerous brands of Charcoal and Anthracite Pig Iron. suitable for Machinery, Railroad Wheels, Chains, Hollowware, etc. Also several brands of the best Puddling Iron, Juniata Blooms suitable for Wire, Boiler Plate, Axe Iron, Shovels, etc. The attention of those engaged in the manufacture of Iron is solicited by

A. WRIGHT & NEPHEW,
Vine Street Wharf, Philadelphia.

Iron.

THE SUBSCRIBERS having resumed the agency of the New-Jersey Iron Company, are prepared to execute orders for the different kinds and sizes of Iron usually made at the works of the company, and offer for sale on advantageous terms.

150 tons No. 1 Boonton Foundry Pig Iron.
100 " No. 2 do. do. do.
300 " Nos. 2 & 3 Forge do. do.
100 " No. 2 Glendon do. do.
140 " Nos. 2 & 3 Lehigh Crane do do.
100 " No. 1 Pompton Charcoal do.
100 " New-Jersey Blooms
50 " New-Jersey Faggoting Iron, for shafts
Best Bars, 1/2 to 4 inch by 1/2 to 1 inch thick.
Do do Rounds and Squares, 1/2 to 3 inch.
Rounds and Squares, 3-16 to 1 inch.
Half Rounds, 1/2 to 1 in. Ovals & Half Ovals 1/2 to 1 1/2 in.
Bands, 1/2 to 4 inch. Hoops, 1/2 to 2 inch.
Trunk Hoops, 1/2 to 1 1/2 in. Horse Shoe & Nut Iron.
Nail Plates. Railroad Spikes.

DUDLEY B. FULLER & Co., 139 Greenwich-st. and 85 Broad-st.

WILLIAM JESSOP & SONS' CELEBRATED CAST-STEEL.

The subscribers have on hand, and are constantly receiving from their manufactory,

PARK WORKS, SHEFFIELD,

Double Refined Cast Steel—square, flat and octagon.
Best warranted Cast Steel—square, flat and octagon.
Best double and single Shear Steel—warranted.

Machinery Steel—round.
Best and 2d gy. Sheet Steel—for saws and other purposes.

German Steel—flat and square, "W. I. & S." "Eagle" and "Goat" stamps.

Genuine "Sykes," L. Blister Steel.
Best English Blister Steel, etc., etc., etc.

All of which are offered for sale on the most favorable terms by

WM. JESSOP & SONS,

91 John street, New York.

Also by their Agents—

Curtis & Hand, 47 Commerce street, Philadelphia.

Alex'r Fullerton & Co., 119 Milk street, Boston.

Stickney & Beatty, South Charles street, Baltimore.

May 6, 1848.

SPRING STEEL FOR LOCOMOTIVES, TENDERS AND CARS.

The subscriber is engaged in manufacturing spring steel from 1 1/2 to 6 inches in width, and of any thickness required: large quantities are yearly furnished for railroad purposes, and wherever used its quality has been approved of. The establishment being large, can execute orders with great promptitude, at reasonable prices, and the quality warranted. Address **J. F. WINSLOW, Agent,**
Albany Iron and Nail Works.

JOHNSON, CAMMELL & Co's Celebrated Cast Steel,

AND
ENGINEERING AND MACHINE FILES,
which for quality and adaptation to mechanical uses, have been proved superior to any in the United States. Every description of square, octagon, flat and round cast steel, sheet, shovel and railway spring steel, best double and single shear steel, German steel, flat and square, goat stamps, etc. Saw and file steel, and steel to order for any purposes, manufactured at their Cyclops Steel Works Sheffield.

JOHNSON, CAMMELL & CO.,
100 William St., New York.

November 23 1849.

American Cast Steel.

THE ADIRONDAC STEEL MANUFACTURING CO. is now producing, from American iron, at their works at Jersey City, N.J., Cast Steel of extraordinary quality, and is prepared to supply orders for the same at prices below that of the imported article of like quality. Consumers will find it to their interest to give this a trial. Orders for all sizes of hammered cast steel, directed as above, will meet with prompt attention.

May 28, 1849.

To Steam Engine Builders.

THE Undersigned offer for sale, at less than half its cost, the following new machinery, calculated for an engine of 62 inches cylinder and 10 feet stroke, viz:

- 2 Wrought Iron Cranks, 60 inches from centre to centre.
- 1 Do. do. Connecting Rod Strap.
- 2 Do. do. Crank Pins.
- 1 Eccentric Strap.
- 1 Diagonal Link with Brasses.
- 1 Cast Iron Lever Beam (forked).

The above machinery was made at the West Point Foundry for the U. S. Steamer Missouri, without regard to expense, is all finished complete for putting together, and has never been used. Drawings of the cranks can be seen on application to

HENRY THOMPSON & SON,
No. 57 South Gay St., Baltimore, Md.

Sept. 12, 1849.

Railroad Instruments.

THEODOLITES, TRANSIT COMPASSES,
and Levels, with Fraunhoffer's Munich Glasses, Surveyor's Compasses, Chains, Drawing Instruments, Barometers, etc., all of the best quality and workmanship, for sale at unusually low prices, by

E. & G. W. BLUNT,

No. 179 Water St., cor. Burling Slip.

New York, May 19, 1849.

Ballard's Improved JACK-SCREW.

PATENTED.

THE ADVANTAGES OF THIS Screw for Stone Quarries, Railroads, Steam Boiler Builders, and for other purposes are superior to any other similar machine.

The improvement consists in being able to use either end of the screw, as occasion requires.

It is capable of raising the heaviest Locomotive with ease, being portable, strong and powerful, and not likely to get out of order.

Many Railroad Companies and Boiler Makers have them in use—by whom they are highly recommended.

JACK SCREWS,

of various sizes, power and price, constantly on hand at the manufactory.

No. 7 Eldridge Street,

near Division Street.

New York, Jan. 19, 1850.

To Railroad Companies and Contractors.

FOR SALE.—Two Locomotive Engines and Tenders, at present in use on the Beaver Meadow Railroad, being too light for their coal trains, but well calculated for either gravel or light passenger trains.

They weigh, in running order, about 8 tons each—having one pair of driving wheels 4 feet diameter, 4 truck wheels 30 inches diameter, with cylinders 10 in. diameter, and 18 inches stroke of piston. Tenders on 4 wheels. Address **JAMES ROWLAND,**
Pres't. Beaver Meadow Railroad & Coal Co., Philadelphia.

or, **L. CHAMBERLAIN, Sec'y,**
at Beaver Meadow, Pa.

May 19, 1849.

To Inventors and Patentees.

OWEN G WARREN, ARCHITECT, Has had many years' experience as Agent for obtaining Patents, both in this country and Europe, and will transact such business promptly and reasonably. Persons at a distance can have their business done by correspondence—without the necessity of visiting this city or Washington. Office No. 94 Merchants Exchange, Wall st., corner of Hanover st., up stairs.

To Railroad Companies.

FOR SALE—A Second-hand Locomotive Engine and Tender, of about 10 tons weight, in good order, and warranted to perform well. Any company wanting a cheap engine for a passenger or light burden train, will rarely meet with an opportunity so favorable as the present. The engine and tender are in perfect running order, and will be tested to the satisfaction of any one wishing to purchase. Price \$1,500.

Address **J. B. MOORHEAD,**
Frazer P.O., Chester county, Pa.

P.S.—The Engine can be seen by calling on H. Osmond & Co., Car-builders, Broad st., Philadelphia.
September 6, 1849.

India-rubber for Railroad Cos.

RUBBER SPRINGS—Bearing and Buffer—Fuller's Patent—Hose from 1 to 12 inches diameter. Suction Hose. Steam Packing—from 1-16 to 2 in. thick. Rubber and Gutta Percha Bands. These articles are all warranted to give satisfaction, made under Tyer & Helm's patent, issued January, 1849.—No lead used in the composition. Will stand much higher heat than that called "Goodyear's," and is in all respects better than any in use. Proprietors of railroads do not be overcharged by pretenders.

HORACE H. DAY,

Warehouse 23 Courtlandt street.

New York, May 21, 1849.

Fire Brick.

THE Subscribers have constantly on hand Rafford's Stourbridge, Oak Farms Stourbridge, Lister, Wortley, Red and White Welsh Fire Bricks, common and fancy shapes. Also,

ROOFING SLATES,

from the best Welsh quarries, and of all sizes. Also,

COAL,

of all kinds—Liverpool Orell and Cannel, Scotch, New Castle, Pictou, Sidney, Cumberland, Virginia, and all kinds of Anthracite coals. Also,

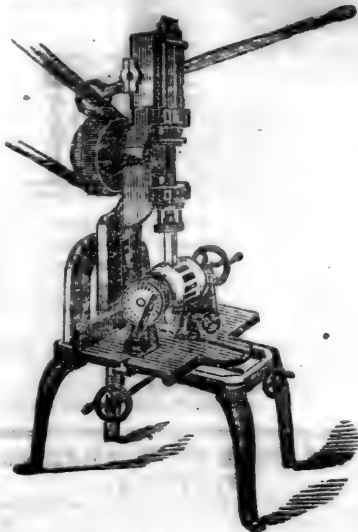
Pig Iron, Salt, etc., etc., for sale at the lowest market price. Apply to

SAMUEL THOMPSON & NEPHEW,

275 Pearl and 43 Gold Sts., New York.

November, 23, 1849.

**Capt. Alfred Swingle's
PATENT BORING
& MORTISING MACHINE.**



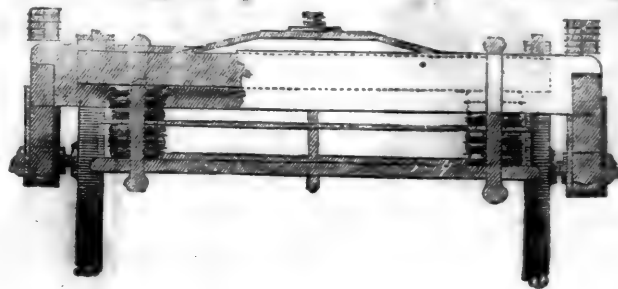
The above Machine was invented by A. SWINGLE, of Texas, in 1846, and Letters Patent were taken out in July, 1848. As a labor saving Machine it stands unrivalled even in these days of improvements. Its uses are innumerable; it may be successfully applied to Doors, Sashes, Carriages, Wheel-Hubs, and in fact to all kinds of work where the Auger and Chisel can be brought to bear.

The only limit to the speed of the working of this machine is the heating of the tools used. It will perform at least the labor of twelve men, and in vastly better manner, and can be worked equally well by steam power or by hand. It has been used and has given universal satisfaction.

For further information apply to H. B. TRENNETT, 40 Wall St., New York, to whom all orders are to be addressed.

New York, December 15, 1849.

**FULLER'S PATENT
INDIA RUBBER CAR SPRINGS.**



RAILROAD COMPANIES are cautioned, before purchasing Springs, to examine the actual patents and judge for themselves.

Persons, under the Title of the New England Car Company, seeking fraudulently to invade Fuller's rights have put forth so many statements for the purpose of misleading the public, that an enumeration of some facts is absolutely necessary, for the purpose of putting persons interested upon their guard.

Fuller's patent is for the application of Discs of India-rubber with Metal Plates, for forming Springs for Railway Cars and Carriages—either one disc and two plates, or ten discs and plates, or any other number, are equally covered by the patent. Fuller is not bound to the use of short discs—he may use long discs and plates.

Ray's patent is simply and wholly the forming of air tight rubber cylinders, with hoops or bands round the outside, and the combination of elasticity of India rubber, with the elasticity of atmospheric air confined in the cylinder, and in no part of his patent is he authorized to use the form of spring which he is now fraudulently supplying to Railroad Companies. Such springs are direct and positive infringements of the very letter of Fuller's patent.

Fuller's patent is dated October, 1845, Ray's patent, August, 1848.

The spring patented by Ray never has been put in operation, and never can be made useful for Railroad cars.

A mere experiment, even if made, it is well known does not prove an invention; and it is ridiculous for such parties to hope to mislead the Presidents and Superintendents of Railroad companies, by claiming the invention because Ray alleges he made an experiment—which Fuller had made before him—had actually brought into working order, and obtained a patent for—and this too before Mr. Ray states he made his experiment—and that experiment not claimed to have been applied to a car or carriage.

Besides, the invention could not have been developed until India rubber, properly Vulcanised, could be made of a sufficient thickness. In the United States the art of vulcanising rubber by steam heat, (by which

means only a body of rubber having any considerable thickness be vulcanised,) was not introduced until after the grant by the American government of the patent for springs to Fuller—whereas the process of vulcanising rubber by steam heat was invented in England about three years previously, and was used by Fuller there. This fact refutes entirely the claim of invention put forth by Mr. Ray, and proves the impossibility of his pretensions being true.

Fuller was the first and only inventor of the spring. A Mr. Dorr, whose connection with Mr. Goodyear is well known in this country, applied in England to Mr. Fuller, after he had published and patented his invention, and introduced another party for the purpose of obtaining the agency for the United States. They were furnished with a complete set of drawings and models, and with instructions to make arrangements for the supply of material of American manufacture—from that hour to the present not a single communication has been received from them. Some of these identical models have been traced into the hands of parties now seeking to invade Fuller's rights, and who have exhibited them as specimens of their own invention.

After this, the conveyance was made by Goodyear to certain parties here for the use for railroad springs of what he calls his Metallic rubber. Comment is unnecessary.

There are 5 or 6 different processes for the manufacture of vulcanised rubber, patented by as many different parties, some here, some in England, either of which would probably make good springs.

A large and powerful company has been organised under Fuller's patent, the particulars of which shall be given very shortly.

An action has been commenced against three railroad companies for infringement; and all other parties will assuredly be prosecuted if they continue farther to infringe upon Fuller's patent.

W. C. FULLER.

The only persons authorised to supply the Springs are **G. M. KNEVITT**, 39 Broadway, N. York, General Agent for the U. S.; and **JAS. LEE & Co.**, 18 India Wharf, Boston. **JOHN THORNLEY**, Chestnut st., Philad.

Arch St. Machine Shop.

BIRKENBINE, MARTIN & TROTTER,
Makers of

STEAM ENGINES,
and
HYDRAULIC MACHINERY,
NO. 16 ARCH STREET,
PHILADELPHIA.

Will construct Steam Engines, Pumps, for Draining Mines and Land; supplying Water to Towns, Factories, Farms, etc;

Also, Street Stops, Fire Plugs, Water Tanks, and Hydraulic Rams, with

(BIRKENBINE'S PATENT VALVES.)

B., M. & T. contract for Warming and Ventilating Buildings by Steam or Warm Water.

J. E. Mitchell,

NO. 14 OLD YORK ROAD, PHILADELPHIA.

Importer and manufacturer of

New Castle }
Nova Scotia } Grindstones, of all sizes and grits.
Wickesley }
French Burr }
Cocaheo } Millstones, made to order, with all
Cologne } the recent improvements.
American and }
Patent compressed } Fire Bricks and Tiles of various
Garnkirk } sizes.
Burr Blocks, Bolting Cloths, Mill Irons, etc.

To the Proprietors of Rolling Mills and Iron Works.

THE Undersigned—Proprietors of Townsend's Furnace and Machine Shop, Albany—are extensively engaged in the manufacture of Machinery and fixtures for Iron, and Copper Rolling Mills, and Iron Works. Having paid particular attention to the manufacture of *Rolls* (Rollers), both *chilled* and *dry-sand*, they feel confident that they can execute orders for such castings in a satisfactory manner. And to give assurance of this, they beg leave to refer to the following named persons, proprietors and managers of some of the most extensive rolling mills in the country, viz: Jno. F. Winslow, J. Tuckerman, H. Burden, W. Burt, J. & J. Rogers, Salsus & Co., J. B. Bailey, L. G. B. Cannon, Hawkins & Atwater, etc., etc.

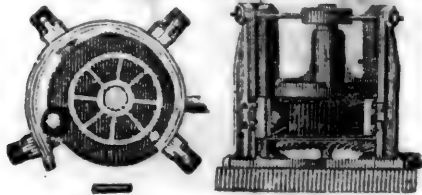
F. & T. TOWNSEND.

Albany, August 18, 1849.

Steam Boiler Explosions.

THE Subscriber having been appointed sole Agent for Faber's Magnetic Water Gauge, is now ready to supply the trade, and also individuals with this celebrated instrument. Besides the greatest safety from explosion resulting from its use, it is a thorough check against careless stoking and feeding. In marine engines it will regulate the exact quantity required in the "blow off." Pamphlets containing full information, can be had free on application to the Agent

JOSEPH P. PIRSSON,
Civil Engineer, 5 Wall st.

MACHINERY.**Henry Burden's Patent Revolving Shingling Machine.**

THE Subscriber having recently purchased the right of this machine for the United States, now offers to make transfers of the right to run said machine, or sell to those who may be desirous to purchase the right for one or more of the States.

This machine is now in successful operation in ten or twelve iron works in and about the vicinity of Pittsburgh, also at Phoenixville and Reading, Pa., Covington Iron Works, Md., Troy Rolling Mills, and Troy Iron and Nail Factory, Troy, N. Y., where it has given universal satisfaction.

Its advantages over the ordinary Forge Hammer are numerous: considerable saving in first cost; saving in power; the entire saving of shingler's, or hammerman's wages, as no attendance whatever is necessary. It being entirely self-acting; saving in time from the quantity of work done, as one machine is capable of working the iron from sixty puddling furnaces; saving of waste, as nothing but the scoria is thrown off, and that most effectually; saving of staffs, as none are used or required. The time required to furnish a bloom being only about six seconds, the scoria has no time to set, consequently is got rid of much easier than when allowed to congeal as under the hammer. The iron being discharged from the machine so hot, rolls better and is much easier on the rollers and machinery. The bars roll rounder, and are much better finished. The subscriber feels confident that persons who will examine for themselves the machinery in operation, will find it possesses more advantages than have been enumerated. For further particulars address the subscriber at Troy, N. Y.

P. A. BURDEN.

Railroad Spikes and Wrought Iron Fastenings.

THE TROY IRON AND NAIL FACTORY. Exclusive owner of all Henry Burden's Patented Machinery for making Spikes, have facilities for manufacturing large quantities upon short notice, and of a quality unsurpassed.

Wrought Iron Chairs, Clamps, Keys and Bolts for Railroad fastenings, also made to order. A full assortment of Ship and Boat Spikes always on hand.

All orders addressed to the Agent at the Factory will receive immediate attention.

P. A. BURDEN, Agent,
Troy Iron and Nail Factory, Troy, N. Y.

RAILROAD WHEELS.

CHILLED RAILROAD WHEELS.—THE UNDERSIGNED are now prepared to manufacture their Improved Corrugated Car Wheels, or Wheels with any form of spokes or discs, by a new process which prevents all strain on the metal, such as is produced in all other chilled wheels, by the manner of casting and cooling. By this new method of manufacture, the hubs of all kinds of wheels may be made whole—that is, without dividing them into sections—thus rendering the expense of banding unnecessary; and the wheels subjected to this process will be much stronger than those of the same size and weight, when made in the ordinary way.

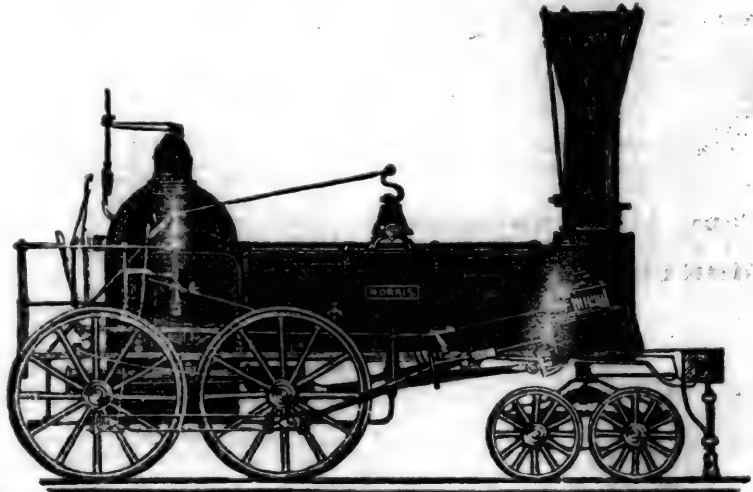
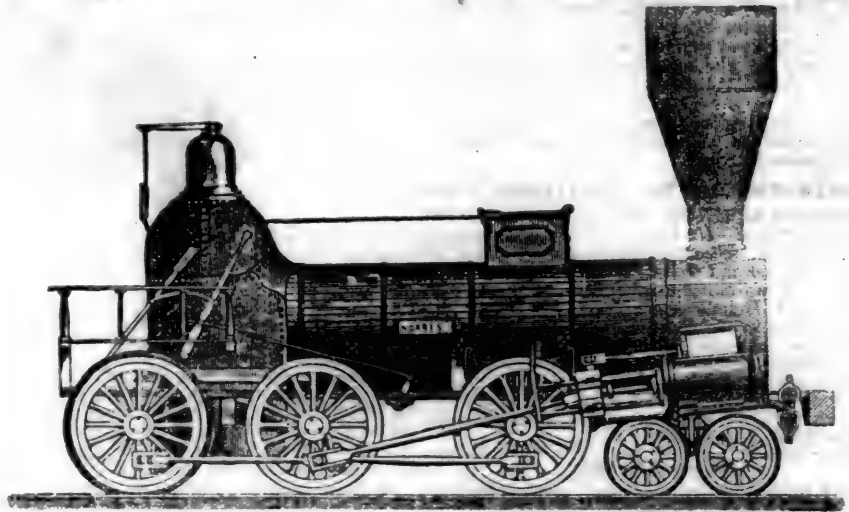
A. WHITNEY & SON,
Willow St., below 13th,
Philadelphia, Pa.

CHILLED RAILROAD WHEELS.—THE UNDERSIGNED, the Original Inventor of the Plate Wheel with solid hub, is prepared to execute all orders for the same, promptly and faithfully, and solicits a share of the patronage for those kind of wheels which are now so much preferred, and which he originally produced after a large expenditure of time and money.

A. TIERS,
Point Pleasant Foundry.

He also offers to furnish Rolling Mill Castings, and other Mill Gearing, with promptness, having, he believes, the largest stock of such patterns to be found in the country.

Kensington, Philadelphia Co.,
March 12, 1843.

NORRIS' LOCOMOTIVE WORKS.
BUSHHILL, SCHUYLKILL SIXTH-ST., PHILADELPHIA.

THE UNDERSIGNED Manufacture to order Locomotive Steam Engines of any plan or size. Their shops being enlarged, and their arrangements considerably extended to facilitate the speedy execution of work in this branch, they can offer to Railway Companies unusual advantages for prompt delivery of Machinery of superior workmanship and finish.

Connected with the Locomotive business, they are also prepared to furnish, at short notice, Chilled Wheels for Cars of superior quality.

Wrought Iron Tyres made of any required size—the exact diameter of the Wheel Centre, being given, the Tyres are made to fit on same without the necessity of turning out inside.

Iron and Brass castings, Axles, etc., fitted up complete with Trucks or otherwise.

NORRIS, BROTHERS

LAWRENCE'S ROSENDALE HYDRAULIC Cement. This Cement is warranted equal to any manufactured in this country, and has been pronounced superior to Gracis' "Roman." Its value for Aqueducts, Locks, Bridges, Flooms, and all Masonry exposed to dampness, is well-known, as it sets immediately under water, and increases in solidity for years. For sale in lots to suit purchasers, in tight papered barrels, by

JOHN W. LAWRENCE,
142 Front-street, New York.

Orders for the above will be received and promptly attended to at this office. 32 ly.

PATENT MACHINE MADE HORSE-SHOES.

The Troy Iron and Nail Factory have always on hand a general assortment of Horse Shoes, made from Refined American Iron.

Four sizes being made, it will be well for those ordering to remember that the size of the shoe increases as the numbers—No. 1 being the smallest.

P. A. BURDEN, Agent,
Troy Iron and Nail Factory, Troy, N. Y.

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FOR the use of SCHOOLS and SELF-INSTRUCTION, containing,

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2d. Examples for drawing plans, sections and elevations of Buildings and Machinery, the mode of drawing elevations from circular and polygonal plans, and the drawing of Roman and Grecian Mouldings.

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4th. A treatise on Linear Perspective, with numerous examples and full explanations, rendering the study of the art easy and agreeable.

5th. Examples for the projection of shadows.

The whole illustrated with 50 STEEL PLATES. Published by WM. MINFIE & CO.,

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AMERICAN RAILROAD JOURNAL.

STEAM NAVIGATION, COMMERCE, MINING, MANUFACTURES.

HENRY V. POOR, Editor.

ESTABLISHED 1831.

PUBLISHED WEEKLY, AT No. 136 NASSAU ST., NEW YORK, AT FIVE DOLLARS PER ANNUM IN ADVANCE.

SECOND QUARTO SERIES, VOL. VI., No. 9.]

SATURDAY, MARCH 2, 1850.

[WHOLE No. 724, VOL. XXIII.]

ASSISTANT EDITORS,

J. T. HODGE, *For Mining and Metallurgy.*

GEN. CHAS. T. JAMES, *For Manufactures and the Mechanic Arts.*

M. BUTT HEWSON, C. E., *For Civil Engineering.*

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American Railroad Journal.

PUBLISHED BY J. H. SCHULTZ & Co., 136 NASSAU ST.

Saturday, March 2, 1850.

Banking Laws of New York.

The history of Banking shows that the amount of specie in the banks bears but a small proportion to the circulation of their bills. The extent of their circulation, as a general rule, is the true measure of the profits of banking. This circulation is greater or less, according to the measure of confidence felt by the community in the ability of the banks to redeem their bills. This may be stated as the general laws affecting banking, modified, of course, by the laws of trade and such circumstances as influence particular sections or localities.

Chartered banks have been long established on the idea of a specie basis, with certain exclusive privileges.

In 1838, an attempt was made in the State of New York to arrange a system of banking, under general laws, open to all parties on equal terms. Who was the father or originator of this new sys-

tem, we are not able to say, though we have heard its paternity attributed to Silas M. Stillwell, Esq., of this city. Whoever he may have been who gave to the world this new scheme for banking, he now has the satisfaction of witnessing its successful application to all purposes of business, and to find its principles incorporated into the Constitution of the State of New York, as appears by the following extract from the Constitution of the State of New York, adopted 1846:—

§ 2. Corporations may be formed under general laws; but shall not be created by special act, except for municipal purposes, and in cases where, in the judgment of the Legislature, the objects of the corporation cannot be obtained under general laws. All general laws and special acts passed pursuant to this section, may be altered from time to time, or repealed.

§ 3. Dues from corporations shall be secured by such individual liability of the corporators and other means as may be prescribed by law.

§ 4. The term corporations as used in this article, shall be construed to include all associations and joint stock companies having any of the powers or privileges of corporations not possessed by individuals or partnerships. And all corporations shall have the right to sue and shall be subject to be sued in all courts in like cases as natural persons.

§ 5. The Legislature shall have no power to pass any act granting any special charter for banking purposes; but corporations or associations may be formed for such purposes under general laws.

§ 6. The Legislature shall have no power to pass any law sanctioning in any manner, directly or indirectly, the suspension of specie payments by any person, association or corporation, issuing bank notes of any description.

§ 7. The Legislature shall provide by law for the registry of all bills or notes issued or put in circulation as money, and shall require ample security for the redemption of the same in specie.

§ 8. The stockholders in every corporation and joint stock association for banking purposes, issuing bank notes or any kind of paper credits to circulate as money, after the first day of January, one thousand eight hundred and fifty, shall be individually responsible to the amount of their respective share or shares of stock in any such corporation or association, for all its debts and liabilities of every kind contracted after the said first day of January, one thousand eight hundred and fifty.

§ 9. In case of the insolvency of any bank or banking association, the bill-holders thereof shall be entitled to preference in payment over all other creditors of such bank or association.

§ 10. It shall be the duty of the Legislature to provide for the organization of cities and incorporated villages, and to restrict their power of taxation, assessment, borrowing money, contracting

debts, and loaning their credit, so as to prevent abuses in assessment, and in contracting debt by such municipal corporations.

The main feature of this Free Banking law is the increased security required for the redemption of its bills. The principal means held by the chartered banks for the redemption of their circulation are the promissory bills and notes of its customers. If these are convertible into specie on short notice, the banks are regarded in a sound condition. If the paper of its customers proves valueless, to the same extent is the bank weakened.

The New York Banking law, under the new Constitution, requires the security for the redemption of the bills to be placed in the office of the State Comptroller. This security can never be surrendered except on the return of the bills. Under this law, the State takes the security into its own hands. In the case of the old chartered banks, it trusted the security in the hands of its directors for the time being. These directors had only to substitute worthless promises for good ones, and the bills of the bank become worthless, and the bill holders had no remedy.

Under the old system, the circulation was expanded and contracted at the pleasure of the banks. Under the present system, it is subject to no fluctuation but the laws of trade.

The Law of April 18, 1838, section 1, authorized the State Comptroller to prepare bills to be countersigned by the Register.

Section 2 authorized the issuing of these bills on deposit of the stocks of any one of the States or of the United States.

This section was amended in 1840, by substituting the following:—

§ 2. Whenever any person or association of persons, formed for the purpose of banking, under the provisions of this act, shall lawfully transfer to the Comptroller any portion of the public stock issued or to be issued by this State, such person or association of persons, shall be entitled to receive from the Comptroller an equal amount of such circulating notes of different denominations, registered and countersigned as aforesaid; but such public stock shall in all cases be, or be made to be, equal to a stock of this State producing five per cent. per annum; and it shall not be lawful for the Comptroller to take such stock at a rate above its par value, nor above its current market value.

Sec. 3 is as follows:

Such persons or association of persons are hereby authorized, after having executed and signed such circulating notes in the manner required by

law, to make them obligatory promissory notes payable on demand, at the place of business within this State of such person or association, to loan and circulate the same as money, according to the ordinary course of banking business as regulated by the laws and usages of this State.

Sec. 4 is as follows:

In case the maker or makers of any such circulating note or notes countersigned and registered as aforesaid, shall at any time hereafter, on lawful demand, during the usual hours of business between the hours of ten and three o'clock, at the place where such note or notes is or are payable, fail or refuse to redeem such note in the lawful money of the United States, the holder of such note or notes making such demand may cause the same to be protested for non-payment by a notary public under his seal of office in the usual manner; and the Comptroller, on receiving and filing in his office such protest, shall forthwith give notice in writing to the maker or makers of such note or notes to pay the same; and if he or they shall omit to do so for ten days after such notice, the Comptroller shall immediately thereupon (unless he shall be satisfied that there is a good and legal defence against the payment of such note or notes) give notice in the State paper, that all the circulating notes issued by such person or association will be redeemed out of the trust funds in his hands for that purpose; and the Comptroller shall be required to apply the said trust funds belonging to the maker or makers of such protested notes to the payment *pro rata* of all such circulating notes, whether protested or not, put in circulation by the maker or makers of such protested notes, pursuant to the provisions of this act, and to adopt such measures for the payment of such notes as will in his opinion most effectually prevent loss to the holders thereof.

§ 5. The Comptroller may give to any person or association of persons so transferring stock in pursuance of the provisions of this act, powers of attorney to receive interest or dividends thereon, which person or association may receive and apply to their own use; but such powers may be revoked upon such person or association failing to redeem the circulating notes so issued, or whenever, in the opinion of the Comptroller, the principal of such stock shall become an insufficient security; and the said Comptroller, upon the application of the owner or owners of such transferred stock in trust, may, in his discretion, change or transfer the same for other stocks of the kinds before specified in this act, or may transfer the said stocks, or any part thereof, or the mortgages, or any of them hereinafter mentioned and provided for, upon receiving and cancelling an equal amount of such circulating notes delivered by him to such person or association, in such manner that the circulating notes shall always be secured in full, either by stocks or by stocks and mortgages, as in this act provided.

§ 6. The bills or notes so to be countersigned, and the payment of which shall be so secured by the transfer of public stocks, shall be stamped on their face, "Secured by the pledge of public stocks."

§ 7. Instead of transferring public stocks as aforesaid to secure the whole amount of such bills or notes, it shall be lawful for such person or association of persons, in case they shall so elect before receiving any of the said bills or notes, to secure the payment of one half of the whole amount so to be issued, by transferring to the Comptroller bonds and mortgages upon real estate, bearing at least six per cent. interest, of this State, payable annually or semi-annually; in which case all bills or notes issued by the said person or association of persons, shall be stamped on their face, "Secured by pledge of public stocks and real estate."

§ 8. Such mortgages shall be only upon improved, productive, unincumbered lands within this state, worth, independently of any buildings thereon, at least double the amount for which they shall be so mortgaged; and the Comptroller shall prescribe such regulations for ascertaining the title and the value of such lands as he may deem necessary; and such mortgages shall be payable within such time as the Comptroller may direct.

The provisions of sections 7 and 8 are modified

by the laws of 1848 and 1849, as follows:

Law of 1848.

§ 2. The securities which banking associations or individual bankers hereafter to be organized under the provisions of the above recited act, passed April 15, 1838, and the amendments thereto, shall deposit with the Comptroller as security for the redemption of circulating notes issued to them by the said Comptroller, shall be New York State stocks in all cases to be or to be made to be equal to a stock producing six per cent. per annum, and it shall not be lawful for the Comptroller to take such stocks at a rate above its par value; or the securities shall not be less than one-half in such stock, and one-half in bonds and mortgages upon improved, productive, unincumbered lands in this State, exclusive of any buildings thereon, said mortgages bearing an interest of not less than seven per cent. per annum, and to an amount not exceeding two-fifths the value of said lands.

Law of 1849.

§ 1. The stocks which banking associations or individual bankers, now or hereafter to be organized under the provisions of the Act "To authorize the business of Banking," passed April 18th, 1838, and the amendments thereto, shall hereafter deposit with the Comptroller, shall be New York State stocks, in all cases to be, or to be made to be, equal to stock producing six per cent. per annum, or at least one-half the amount so deposited shall be in the stocks of the State of New York, as before mentioned, and not exceeding one-half in stocks of the United States, in all cases to be, or to be made to be, equal to a stock producing an interest of six per cent. per annum; and it shall not be lawful for the Comptroller to take such stocks at a rate above their par value, or above their current market value.

In this number we give only the main features of the New York system. We find it a matter so full of interest, and have so many inquiries on the subject, that we shall hereafter give full details of the law and the rules and regulations adopted by the Comptroller of the State in perfecting and carrying out the system.

New Jersey is adopting the same policy, and a bill containing similar provisions as the New York law, is now pending before the Legislature of that State. A similar movement is going on in Pennsylvania.

We believe there is not a merchant or business man of this city who does not concur in the opinion that our present banking law is an improvement upon the old, or the chartered bank system.

The chartered banks pay a tax to the State for their banking privileges, the free banks are exempted from this liability. The chartered banks, many of them, have surrendered their charters for the purpose of adopting the free bank system.

We give, in a condensed form, from the quarterly returns made to the Comptroller, the following statement showing the condition of the banks at periods designated by the State officers. The following exhibits the condition of the banks on the morning of the 23d Sept. and the 29th Dec. 1849. The Sept. report embraces returns from 187 banks and two branches. At the date of the last report there were 188 banks and two branches banking institutions in the State, but the report embraces reports from only 184 banks and one branch. The charter of the Bank of Auburn, Bank of Ithaca, Bank of Monroe and the Bank of Utica and its branch, expired on the 1st of January, 1850. The Bank of Ithaca and the Bank of Monroe did not report, and no statements were received from the Champlain, Walter Joy and Warren County Banks.

ANNOUNCES.

Loans and discounts except to directors and

brokers.....	\$81,118,923	\$83,070,705
Loans and discounts to directors.....	4,695,678	4,807,915
All other liabilities absolute or contingent to directors.....	1,616,814	1,625,352
All sums due f'm brokers	2,239,618	2,314,790
Real estate.....	3,549,335	3,850,555
Bonds and mortgages....	2,778,134	2,710,835
Stocks.....	12,362,748	11,755,700
Prom'y notes other than for loans and discounts.	236,675	159,353
Loss and expense acc't....	489,158	615,053
+Overdrafts.....	183,163	164,899
Specie.....	9,020,175	8,066,313
Cash items.....	7,472,661	8,001,639
Bills of solv't b'ks on hand	2,253,964	2,611,608
+ do suspended do ..	5,723	5,278
+ Estimated value of same	3,855	1,902
Due from solv't banks on demand.....	9,354,206	10,193,737
do do credit.....	390,171	596,136
+ Due fm susp'd banks on demand.....	269,966	207,175
+ Estimated value of same	58,740	40,220
+ Due from susp'd banks on credit.....	4,418	.....
Add for cents.....	605	597
Total resources....	\$136,256,473	\$138,998,917

* The whole of this item and parts of the items marked + do not go into the general aggregate.

LIABILITIES.		
Capital.....	\$45,588,320	\$45,541,708
Profits.....	7,314,626	7,580,284
Notes in circulation not registered.....	650,773	643,380
Registered notes in circulation.....	23,035,755	23,522,600
Due treas'r of state of N.Y.	2,567,127	2,809,238
Due depositors on demand	37,342,770	38,238,526
Due individuals and corporations other than banks and depositors...	748,284	665,980
Due banks on demand....	16,935,601	17,709,410
Due banks on credit....	697,414	1,012,850
Due to others not included in either the ab'v'e heads	1,375,797	1,270,046
Total liabilities....	\$136,256,473	\$138,998,917

The following statement exhibits the condition of the banks on the 30th of June, the 22d Sept., and the 29th of Dec., 1849:—

	June 30, '49.	Sept. 22, '49.	Dec. 29, '49.
Loans and discounts.....	\$82,960,422	\$85,814,601	\$87,878,620
Stocks.....	12,800,993	12,362,748	11,755,700
Specie.....	10,571,517	9,020,175	8,066,313
Cash items.....	6,479,829	7,472,661	8,001,639
Bank notes.....	2,679,349	2,233,964	2,611,608
Due fm banks.....	11,746,279	9,744,377	10,789,873
Capital.....	44,929,505	45,588,320	45,541,708
Circulation.....	21,912,616	23,686,528	24,165,980
Deposits.....	35,604,999	37,342,770	38,238,526
Due to banks.....	20,994,078	17,633,015	18,722,260
Due canal fund.....	1,112,298	.....	.....

Upon comparing the returns of December with those of September, we find a diminution of only \$46,618 of banking capital, notwithstanding two of the safety fund and three of the free banks are not included in the last report. In the item of loans and discounts there is an increase of \$2,064,019, and in stocks a decrease of \$607,048. There is less specie by \$953,862 than there were in the vaults on the 22d of Sept. Of this amount, \$853,290 has been taken from the New York city banks.— There is a slight increase of circulation and deposits, and in other items there are some slight changes, but they are not very important.

New York.

Plattsburg and Canada Railroad.—One half the capital necessary for the organization of the company to construct the Plattsburg and Canada railway has already been subscribed.

POPULATION OF THE UNITED STATES.

Table, Showing the Population of each State and Territory, as exhibited by the enumerations in Fifty Years, with its Decennial Rate of Increase during the same period.

STATES & TERRITORIES.	POPULATION.						DECENNIAL INCREASE. RATIO PER CENT.				
	1790	1800	1810	1820	1830	1840	1800.	1810.	1820.	1830.	1840.
Maine.....	96,540	153,719	228,705	298,335	399,455	501,793	57.1	50.7	30.4	33.9	26.2
N. Hampshire.	141,899	183,762	214,360	244,161	269,328	284,574	30.0	16.5	14.0	18.5	6.0
Vermont.....	85,416	154,465	217,713	235,764	280,652	291,948	80.6	41.0	8.2	9.0	4.0
Massachusetts.	378,717	423,245	472,040	523,287	610,408	737,699	11.7	11.5	10.9	16.6	20.8
Rhode Island.	69,110	69,122	77,031	83,059	97,199	108,830	0.0	11.4	7.8	17.0	11.9
Connecticut...	238,141	251,002	262,042	275,202	297,675	309,978	5.4	4.3	5.0	8.1	4.1
	1,009,823	1,233,315	1,471,891	1,659,806	1,954,717	2,234,822	21.1	19.3	12.8	17.7	14.2
New York....	340,120	586,756	959,049	1,372,812	1,918,608	2,428,921	72.5	63.4	43.1	39.7	26.6
New Jersey....	184,139	211,949	245,555	277,575	320,823	373,306	15.1	15.9	13.0	15.5	16.3
Pennsylvania..	434,373	602,365	810,091	1,049,458	1,348,233	1,724,033	38.6	34.4	29.5	28.5	27.9
Delaware.....	59,096	64,273	72,674	72,749	76,748	78,085	8.7	13.0	0.1	5.5	1.7
Maryland.....	319,728	341,548	380,546	407,350	447,400	470,019	6.8	11.4	7.0	9.7	5.1
Dt. of Colum..	14,093	24,023	33,039	39,834	43,712	43,712	.....	36.8	28.9	29.2	23.3
	1,337,456	1,820,984	2,491,938	3,212,983	4,151,286	5,118,076	36.3	10.7	9.3	13.7	33.0
Virginia.....	748,308	880,200	974,622	1,065,379	1,211,405	1,239,797	17.6	10.7	9.3	13.7	2.3
North Carolina	393,751	478,103	555,500	638,829	737,987	753,419	21.3	16.2	15.0	15.5	2.1
South Carolina	249,073	345,591	415,115	502,741	581,185	594,398	38.7	20.1	18.1	15.6	2.3
Georgia.....	82,548	162,110	252,433	340,987	516,823	691,392	96.4	55.1	35.1	51.2	33.8
Florida.....	.....	.....	.....	.....	34,730	54,477	.....	.....	.....	.....	56.8
	1,473,680	1,865,995	2,197,670	2,547,936	3,082,130	3,333,483	26.6	17.8	15.9	21.0	8.2
Alabama.....	.....	.....	.....	144,317	309,527	590,756	.....	.....	.....	142.0	90.8
Mississippi....	.....	8,850	40,352	75,448	136,621	375,651	.....	356.0	87.0	81.0	175.0
Louisiana.....	.....	.....	76,556	153,407	215,739	352,411	.....	.....	100.4	40.6	63.3
Arkansas.....	.....	.....	.....	14,273	30,388	97,574	.....	.....	.....	112.9	221.1
Tennessee....	35,791	105,602	261,727	422,813	681,904	829,210	200.0	147.8	61.5	61.3	21.6
	35,791	114,452	378,635	810,258	1,374,179	2,235,602	200.0	230.8	114.0	69.6	63.4
Missouri.....	.....	.....	20,845	66,856	140,455	383,702	.....	.....	219.5	110.9	173.2
Kentucky.....	73,077	220,955	406,511	564,317	687,917	779,828	200.0	83.1	38.8	21.9	13.3
Ohio.....	.....	45,365	230,760	581,434	937,903	1,519,467	.....	408.7	152.0	61.3	62.0
Indiana.....	.....	4,875	24,520	147,178	343,031	685,866	.....	403.6	500.2	133.0	99.9
Illinois.....	.....	.....	12,282	55,211	157,445	476,183	.....	.....	349.5	185.2	202.4
Michigan.....	.....	.....	4,762	8,896	31,639	212,267	.....	.....	86.8	255.6	570.9
Wisconsin.....	.....	.....	.....	.....	.....	30,945	.....	.....	.....	.....	.....
Iowa.....	.....	.....	.....	.....	.....	43,112	.....	.....	.....	.....	.....
	73,077	271,195	699,680	1,423,622	2,298,390	4,131,370	200.0	158.0	103.5	61.4	79.7
	3,929,827	5,305,925	7,239,814	9,654,596	12,866,020	17,069,453	35.01	36.45	33.35	33.26	32.67

St. Louis and San Francisco Railroad.

The Map, published in Boston, by W. L. Dearborn, Civil Engineer; (with his letters to P. P. F. Degrand,) designates a line of railroad identical with the line delineated in the Map, which is annexed to a pamphlet, published at St. Louis, by I. Loughsbrough.

In this St. Louis pamphlet (the authenticity of which is certified by the St. Louis Committee,) I. Loughsbrough thus demonstrates that this route is already sufficiently known to warrant a definite conclusion in favor of its being A GOOD RAILROAD ROUTE:—

"Let us now proceed [he says] to a topographical examination of the route from St. Louis to the bay of San Francisco. The route which we shall propose for this great railway is not one through a region unknown to science and the world. We make no guesses, as has been done, and must be done by all who advocate the claims of other routes. We do not say that passes through the mountains may be found, and that the probabilities are that a practicable line for a railway may be had from St. Louis to San Francisco, as has and must be said by the advocates of all the routes but ours. We shall propose a route which, with but slight variations, (and those variations undoubtedly for the better) has been already surveyed along its whole line—a route along which barometrical and other scientific observations have already been made—a route which has been minutely described by an authorized and eminently well qualified officer of the Corps of Topographical Engineers, and maps and profile sections of which are already de-

posited in the Topographical Bureau at Washington. We shall propose a route which was travelled by Mr. Henry, a fur trader of intelligence, as far as the vicinity of Fort Hall, in the year 1809—which has been familiarly known to the children of the mountains, from that day to this—over which they have constantly carried wagons and carts, laden with merchandise—and over which more than twenty thousand emigrants to Oregon, the Salt Lake, and California, have already passed. We shall propose a route, the last portion of which, from the Salt Lake to the Bay, was discovered by Mr. Peter Ogden, a fur trader in the employ of the Hudson's Bay Company, as far back as 1811; which has been repeatedly followed since by intelligent bodies of traders; by which a party of men, under the orders of Capt. Bonneville, proceeded to Francisco Bay; which has been traversed and described by Bryant, Bidwell, and other travellers—which has been surveyed by Col. Fremont, and over which emigrants, with families and wagons, have repeatedly passed, and more than thirty thousand men, with six thousand wagons, and one hundred thousand head of stock, are now passing."

Boston Courier, of Feb. 23d.

The tunnelling of the Andes is a mere question of dollars and cents. There is a great difference between the possibility and practicability of a work. There are unquestionably many possible routes for a railroad to the Pacific; and undoubtedly some practicable ones. Such, we are confident, surveys would show. But to decide upon the

practicability of a route because it has been traversed by teams, and to give the cost of such a work upon no more reliable data, is perfectly absurd. The profile of a section, drawn from such evidence, may involve a tunnel, though it shows a perfect plane. No progress is made by erecting theories, or in deciding upon routes, based upon loose evidence. Let us wait until the proper evidence is before the public, and we shall be saved an immense amount of speculation and conjecture, which can now only confuse ourselves and mislead the public.

Kentucky

Lexington and Frankfort Railroad.

We have the first annual report of this company, from which we make the following extract:—

"In submitting their first Annual Report, the Board of Directors have only to present a statement of the steps taken preparatory to making the road, and they must of necessity recount matters already familiar to most of the stockholders.

The charter of this company became effective by the subscription of two thousand shares of stock of one hundred dollars each, which being made, the State subscribed fifteen hundred shares and paid for it by a transfer of the old road as it now exists, with all the real and personal property pertaining thereto.

Upon the organization of this board, the first object to which attention was directed, was an inquiry into the practicability of changing the route at and near Frankfort, to avoid the inclined plane, and to reach the town and river by locomotive.—Surveys for that purpose were ordered, and the engineer reported upon several routes as practicable, recommending as preferable the one which is adopted. By diverging from the old road some four miles from Frankfort, the town can be reached by a grade of 60 7-10 feet in the mile. The estimated expense of making this portion of the road, and of taking up the old track and re-laying it with heavy iron, and upon timbers of locust and cedar, fell somewhat under \$300,000, and when is added the amount necessary to purchase and build depots and furniture, it would probably amount to that sum. The cash subscription was about \$200,000, and to make it available at all, either the road must be made new in part, and the remainder repaired, or else some mode devised by which additional funds could be procured. The Directors resolved to go on with the means they had, and defer their determination as to the ultimate plan until the further progress of the undertaking. They put the new grade under contract, bought one-half the iron required, and commenced the purchase of timber.—Finding, as they proceeded, that the prospects of the company improved, that favorable contracts for grading were made and materials generally very low, and every investigation giving them greater confidence of success, they called an informal meeting of the stockholders, and secured their approval of a plan to procure a loan of \$70,000."

This loan has been effected, and the means are now secured to reconstruct the road entirely. The company has purchased 2650 tons of iron for the purpose of relaying the track, and the work is going on with all rapidity consistent with a proper regard to economy.

The whole estimated cost of the road, not embracing depots nor its running furniture, is \$290,791 14. The whole length of the road is 29 miles.

The report bears date of the 18th of May last. We therefore defer the full statement of its financial affairs until after the next report is received.

Massachusetts.

South Shore Road.—Below give the circular recently issued by the Directors to the Stockholders:

To the Stockholders of the South Shore Railroad: At the last meeting of the Stockholders, the Directors were authorized to adopt such measures as they might deem expedient to relieve the financial difficulties of the corporation, and for that purpose

they recommend for adoption the following plan:—

The total cost of road paid to Jan. 1, 1850, is.....	\$378,863 34
Due O'Keefe & Co., on contract payable in stock.....	11,400
Land damages unsettled, (possibly....	40,000

Making the whole expense of } the road, complete.....	\$430,263 54
Of this there have been paid or provided for—	
Assessments paid.....	\$153,590
" due and unpaid.....	3,920
O'Keefe's claim payable in stock.....	11,400
	168,900

Leaving the amount of debt to be provided for..... } \$261,363 44

The corporation have surplus real estate, from the sale of which ten to fifteen thousand dollars may be realized, but this has not been taken into the account, but regarded as a resource against contingencies.

To pay this debt, it is proposed to create five thousand new shares, at \$25 per share, to be taken by stockholders only, in proportion to their stock, and payable in monthly instalments of \$5 per share, which will produce \$125,000; and the Directors have the pleasure to assure the stockholders that if this shall be done, they have secured the sale at par of the six per cent. bonds of the Company, payable at the expiration of a term of years, to an amount sufficient to pay the remainder of the debt.

As the Old Colony Railroad are bound to pay 6 per cent. on the cost of the road, the carrying into effect this plan, will at once make that which is now almost worthless a permanent dividend-paying stock; and the Directors hope that the stockholders will avail themselves of this opportunity to increase the value of their property to the extent of their ability.

ALFRED C. HERSEY, E. L. WHITE, WILLIAM HUMPHREY, JOSEPH LOUD, JR., JOHN W. LOUD, JAMES C. DOANE, LABAN SOUTHER, D. S. GREENOUGH, Directors.

It will be remembered that this road is only 12 miles long, and no motive power but its own. If we understand the circular, the South Shore stockholders will receive for their \$25, certificates of stock for \$50. If so, the actual liabilities of the company will be increased by the difference between the price of the new stock and par, which amounts to \$125,000 more, so that the actual liabilities will be \$555,263 54, certainly one of the most expensive roads in the country.

RE-ELECTION OF RAILWAY DIRECTORS.

The annual period is now approaching when one third of the directors composing railway boards go out of office by rotation, but they are also eligible for re-election. It appears that there is a very general opinion among shareholders who have paid attention to railway matters, that the more prudent course for the proprietors to pursue at the ensuing meetings would be, to propose and elect from their own body new members, properly qualified, and of business habits, who are not directors at present in any railway company. Some consider that even a comparative ignorance of railway business would be rather an advantage, because the new members would have to inquire into railway matters at the various boards, and thus in acquiring the necessary information themselves, may have the beneficial effect of calling the attention of the old directors to matters which might have hitherto escaped their observation, and have remained neglected on that account. It is believed that no harm would arise from this measure, because all the new members if in error, could be out-voted by the old directors on any question that might be brought forward at the various railway boards. By selecting proper men to fill the vacancies alluded to, it is expected that a great advantage would arise to the shareholders, as it would be the first legitimate step towards the re-organization of railway boards, and the establishment of a new and improved system of railway management. Many of the old directors would gradually disappear from railway boards and the property of railway shareholders would be as gradually relieved from the infliction of an ex-

travagant management, which might be said, in some instances, to have confiscated the property of shareholders to the extent of several millions.—When it is considered that above 400 railway directors annually go through the ceremony of "retiring by rotation," and, as a matter of course, are re-elected by the shareholders, it is not surprising that an erroneous system of railway management wherever established, should be pursued to the present time.—*English Railway Times.*

Legal Rates of Interest.

In the year 1546 the legal rate of interest for money loaned was fixed by law in England at ten per cent. per annum. In 1624 it was reduced by act of Parliament to eight per cent. per annum. During the reign of Queen Anne, and about the year 1710, it was reduced to five per cent., which is now the legal rate of interest in England, where no special contract exists. By the statutes of 1834 and 1840, the usury laws are entirely repealed, except as to contracts for ten pounds and under, and parties are allowed to agree, by contract, for any rate of interest, throughout England, for sums exceeding that amount.

In Ireland the rate of interest is six per cent.—We give below the legal rates of interest in the different States of the Union, with the penalties annexed, for the taking of usurious interest, in each State.

Maine—Six per cent.; forfeit of the claim for usury, with costs.

New Hampshire—Six per cent.; forfeit of thrice the amount unlawfully taken.

Vermont—Six per cent.; recovery in an action with costs.

Massachusetts—Six per cent.; forfeit of thrice the usury, with costs.

Rhode Island—Six per cent.; forfeit of the usury and the interest on the debt.

Connecticut—Six per cent.; forfeit of the whole debt.

New York—Seven per cent.; usurious contracts void.

New Jersey—Six per cent.; forfeit of the whole debt.

Pennsylvania—Six per cent.; forfeit of the whole debt.

Delaware—Six per cent.; forfeit of the whole debt.

Maryland—Six, and on tobacco contracts eight per cent.; usurious contracts void.

Virginia—Six per cent.; forfeit double the usury taken.

North Carolina—Six per cent.; contracts for usury void, and forfeit double the usury.

South Carolina—Seven per cent.; forfeit of interest and premium taken, with costs to debtor.

Georgia—Eight per cent.; forfeit three times the usury and contract void.

Alabama—Eight per cent.; forfeit interest and usury.

Mississippi—Eight per cent.; by agreement as high as ten per cent.; forfeit the usury.

Louisiana—Five per cent., bank interest six, and conventional as high as ten; beyond that, contract void.

Tennessee—Six per cent.; usurious contracts void.

Kentucky—Six per cent.; usury recoverable with costs.

Ohio—Six per cent.; on written agreements may go as high as ten; beyond this contract void.

Indiana—Six per cent.; a fine of double the excess.

Illinois—Six per cent.; forfeit threefold the amt of the whole interest.

Missouri—Six per cent.: by agreement as high as ten; beyond this, forfeit of interest due and usury taken.

Michigan—Seven per cent.; forfeit usury and one-fourth the debt.

Arkansas—Six per cent.: by agreement as high as ten; forfeit usury and contract void.

Florida—Eight per cent.; forfeit interest and usury.

Wisconsin—Seven per cent.: by contract, any

amount agreed upon by the parties.

Iowa—Seven per cent.: by agreement as high as twelve; forfeit three times the excess.

Indiana.

Madison and Indianapolis Railroad.

We are in receipt of the annual report of the directors of this road, submitted to the stockholders at their annual meeting, held at Madison, on the 8th of January last. The following is an exhibit of the receipts and disbursements of the company the past year:

Received from transportation of freight, passengers and U.S. mail.....	\$243,189 89
From other sources, as old metal sold, work done at shops for other roads and persons, &c.....	4,730 45

Making a total of..... \$247,920 34

Amount paid legitimate expenses of road, as per items in general account.....	\$137,530 77
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Amount paid state, in stock, as rent.....	1,152 04
	\$138,682 81

Net earnings..... \$109,237 53

From which deduct payment of July dividend..... 50,737 60

Leaving a balance of..... \$58,499 93

Which gives to the stockholders a present dividend of four and one-half per cent. for the last six months, and eight and one-half per cent. for the year; with a surplus of \$1,246 78.

In comparing results with the preceding report, it must be borne in mind that the fiscal year of 1848 embraced but eleven months.

The total receipts from transportation and mail service, during the past year, it will be seen, are..... \$243,189 89

During the fiscal year of 1848, they were..... 212,095 85

Showing an increase of..... \$31,094 04

Notwithstanding this liberal increase, the receipts have fallen much below the estimates. The estimates would undoubtedly have been realized, but for circumstances entirely beyond control; indeed the two leading ones may be regarded as dispensations of divine Providence.

The causes here referred to were the prevalence of the cholera, and the almost entire loss of the wheat crop of the section of the State connected with the above road. The loss from these alone, are estimated, apparently upon good data, at \$30,000, a sum nearly equal to two per cent. on the capital stock of the company. A large increase to the business of the road for the coming year, from the ordinary sources, is anticipated. In addition to this, the completion of portions of the various roads connecting with the above, must also throw a large business upon it. These roads are the Knightstown road, will be completed 27 miles from Shelbyville, in the spring; the Rushville road 18 miles from the same point; and by the opening of the fall trade, the Bellefontaine road will be completed 26 miles north east of Indianapolis to Pendleton—and the Peru road 20 miles north of the same point to Noblesville; each penetrating a fine agricultural region.

Large additions have been made to the running stock of the road the past year, and it is now fully equipped. In relation to this, and to the general condition of the road we copy the following from the report:

So far as power is concerned, the road may be regarded as fully stocked for two or three years, unless its running distance should be extended. If negotiations now pending, for the running of two roads meeting ours at Indianapolis, should be consummated, we shall want by the first of October

next, two first class freight engines. The cars that may be required are within our own building capacities; and can be put up at much less cost, and in a better manner than elsewhere. We have at present in process of construction two passenger cars, that are required upon our own road.

In the general improvement of the road, for which the stock was last enlarged, very considerable progress has been made during the year. About 24 miles of the track has been relaid with the heavy rail, including something over a mile in the Vernon curves, and the plane, from the foot to the water station, half a mile north of the hill. This work has been executed by Mr. Prindle, and his assistants in an excellent and durable manner. In truth this track is not excelled by any that I have travelled over in the Union. We have now 56 miles of heavy rail, extending to Edinburgh, nearly all of which is in good condition; though portions of the old state track give strong indications of failure.—In addition there has been laid about one mile of switch, or double track, between Columbus and Edinburgh, and the side tracks at Edinburgh, Vernon, and the hill have been extended and much improved.

The track between Edinburgh and Indianapolis is still in fair running condition; though portions of it are yielding to decay, and the passage of heavy trains over it. With about the same expenditure for repairs as last year, it can be well and safely run another season. There are strong reasons, growing out of the embarrassments of the past year, already alluded to, why this should be done, if practicable. It is important that the board, at the present session, should examine and determine this matter.

The above road, under its present efficient management, is a good illustration of what western roads are capable of doing, both for the business of the country, and as yielding a liberal return upon their cost. The success of this work will essentially aid those of a similar character in Indiana in obtaining such assistance as they may require from abroad. They are fortunate in having so successful a work to point to for the purpose of illustrating what may be expected of them when completed.—Several of the unfinished roads of this State have applied to the Madison and Indianapolis for assistance which we have no doubt will be extended to the utmost of its ability. In reference to the future prospect of the road, the President speaks as follows:

Having presented the important business matters that occur to me, I have only to re-affirm what I stated in my last annual report, and have repeated in the present document, that I see nothing in the temporary embarrassments of the past year to weaken my faith in the future productiveness and prosperity of our own work. Its progress thus far has been remarkable. It has built up a sustaining trade within itself; and now wants but a western and northern outlet to increase its revenues and its usefulness even more rapidly than they have been developed in the past. The Terre Haute road may be classed as first in point of usefulness to our own work, and its directors are pressing it forward with great energy, and promise of early success. The grading and bridging of nearly the whole line is under contract; and with the exception of the bridge over White river, at Indianapolis, will be ready for the superstructure and iron during the present season. The Bellefontaine and Peru roads are both ready for the iron; the one 26, the other 20 miles. The branch road to Martinsville has met with great encouragement in the way of subscriptions at home; and the friends of the Columbus, Nashville and Bloomington road are confident they have succeeded in obtaining sufficient reliable stock to prepare their road for the iron. These are all important works to our own; as are the Knights-town and Rushville, whose success is now past doubt. They must largely increase our trade, and under ordinary circumstances, must rather tax our capacity for business, than leave us to linger in want of it.

The following is a list of the officers of the company:

Directors:

John Brough, *President*.
Harvey Bates, Indianapolis.
Thomas A. Morris, "
James M. Ray, "
James Whitcomb, "
Samuel Moore, Mooresville.
Z. Tannehill, Herod, Bartholomew Co.
J. F. D. Lanier, Madison.
Jesse D. Bright, "
Michael G. Bright, "
Jos. G. Marshall, "
William M. Dunn, "
R. H. Winslow, New York.

Secretary:

WILLIAM N. JACKSON.

Treasurer:

SIMEON S. GILLET.

Superintendent of Road:

MERWIN PRINDLE.

Master Machinist:

JOHN O. D. LILLEY.

Superintendent of Trains:

BENJAMIN MCKEEHAM.

Ohio.

Cleveland and Pittsburgh Railroad.

We find in the True Democrat the following account of the present state of this important work. The writer after referring to the fears expressed that a work of such great magnitude could not be completed by Messrs. Chamberlain & Co. within the time stipulated in their contract, goes on to say—

My confidence has been much strengthened by passing along the line, and observing the progress making on the heavy sections. The work at Tinker's Creek is one of these points, and I was gratified to find that the heavy earth work was in such a state of forwardness that its early completion may be regarded as placed beyond a doubt. The bridge at this point is the longest on the line, and may be completed without difficulty, as I have no doubt it will be, by the enterprising contractors.

The next point is Deer Creek, in Lima, Stark county. At this point is the heaviest embankment on the line, measuring some five hundred feet, and averaging near fifty feet in height. It has been in contemplation to put up a wooden superstructure for a portion of the distance. It has now been decided to put in a culvert, and make an embankment the whole distance. Twelve cars and as many carts are at work, and the force will be increased, to complete this heavy work in season for the superstructure.

The next point is the Mahoning Summit. Here the cutting is not deep, but will require time for its completion. A heavy force has been at work all winter, and this point, too, is in such a state of forwardness that no fears are entertained but that it will also be in readiness. From this point to the mouth of Hoane's Run, there is a gradual descent of from three to ten feet. The work is all light, and can be completed in ninety days. This is a beautiful valley. For most of the distance, the hills—which are not high—recede so far from each other as to leave a wide belt of interval lands, of the very best quality. Add to this the directness of the valley, and it really presents some of the most charming scenery through which I have ever passed.

The inquirer, when examining the map of the line, has often asked why the bend near the mouth of this run? The answer is, to pass up this beautiful valley, furnishing ten miles of the cheapest line in Ohio, and avoiding one summit, and heavy grades; and, although the distance is increased near two miles, yet the running time will be less.

At the point where this run empties into the Sandy, about seventy miles from your city, is the distance to which the road will be completed by the first of November next. From this point to Wells-ville, about twenty-eight miles, it is proposed to run a line of coaches until the other portion of the line is completed, which will be about midsummer of 1851.

This will enable the traveller to make his trip from your city to Pittsburgh in from thirteen to fourteen hours, and with much more comfort than by the present mode of conveyance.

A steamboat is to be built for the express purpose of carrying passengers from Wellsville to Pittsburgh in the shortest possible time; and the boat will be fitted up and have accommodations equal to any boat upon the river.

It is often remarked—"Your road ought to strike the river at some more important point." I know of no point between Pittsburgh and Portsmouth that transacts as much business, or receives and ships as much property, as Wellsville. On our route from N. Lisbon to Wellsville, we are really annoyed by meeting and passing so many teams. Persons can have no adequate idea of the business of the place until they spend some time there, or have occasion to traverse some of the roads leading to it.

The estimate of the business of Wellsville, as stated in Professor Twining's report, will surprise many; yet those most familiar with the receipts, think the estimate too low:

"At Wellsville alone, the amount received from the interior in wagons, and returned to it from the Ohio river, is ascertained to be about seventy-five tons a day each way."

Beaver receives from the two canals, and ships upon boats passing up and down the Ohio—yet Beaver receives a very inconsiderable aggregate of produce from wagons, compared the receipts at Wellsville.

From Wellsville, we passed up the Ohio, upon one of those splendid river palaces. The day was as mellow as a May morning, which enabled us to make a minute examination of the route proposed for continuing the road to Pittsburgh, from Wellsville to Beaver. About one-third of the distance, the line would run upon side hill, which has a gradual slope, and will be very easy of construction. The remainder of the distance will be located upon the second table of land, enabling the engineer to choose his grade, and in every instance to keep it above the great freshet of 1832.

Save the Little Beaver, there are no streams of importance. This, with an occasional small run, is all the barrier that nature presents. The expense of grading and bridging will not be much above the average of that of the residue of the line—and there need not be any grade of over five feet to the mile. From Beaver to Pittsburgh the expense will be increased, yet even that will be much lessened by changing the travelled road to the top of the hill, as I understand they contemplate doing, at least where "the narrows" occur.

The above road will connect Lake Erie and the Ohio river by the shortest possible route; and as the connecting link between our great inland seas and the Ohio, it must immediately take rank among our most important railroads in the country. In addition to this advantage of position, it must form one of the links of the main trunk lines of the railroads running from Philadelphia and Baltimore to Lake Erie. As soon as the Baltimore and Ohio railroad reaches Wheeling, connection will be immediately formed with the above road at Wells-ville; the Ohio and Pennsylvania intersect it higher up, using, however, a large portion of it. It traverses too one of the longest settled, richest and most fertile parts of Ohio.

South Carolina.

South Carolina Railroad.—At an election held in Charleston on the 13th inst., the following gentlemen were elected President and Directors of the South Carolina railroad company:

President:

HENRY W. CONNER.

Directors:

Wade Hampton,	Ker Boyce,
H. Gourdin,	John Bryce,
F. H. Elmore,	W. B. Pringle,
W. C. Dukes,	R. Caldwell,
G. A. Trenholm,	Andrew Wallace,
Alfred Huger,	C. J. Shannon,
Robert Martin,	L. J. Patterson,

South Western Railroad Bank.—The following is the result of an election held on the same day, for President and directors of the above institution for the ensuing year:

President:

JAMES ROSE.

Directors:

M. C. Mordecai, William Patton,
James Legare, O. B. Hilliard,
C. A. Magwood, G. B. Locke,
W. J. Grayson, W. C. Gatewood,
I. S. Cohen, H. W. Peronneau,
Geo. A. Hopley, P. J. Porcher.

We quote what follows from the proceedings, as exhibiting the financial condition of the affairs of the road:

John Ravenel, Esq., Chairman of the committee of the sinking fund, presented a report accompanied by the following resolutions:

1. Resolved, That it be referred to the directors to call upon the stockholders for payment of the balance of \$25, due on the shares of the capital stock, by instalments; provided, however, that the instalments shall not exceed \$5 each, nor be required at shorter intervals than ninety days.

2. Resolved, That on the completion of the works contemplated in the estimate submitted with this report, all expenditures thereafter to be incurred for the construction and repair of depots, the keeping up of the roads, the purchase and repairs of locomotives, cars and machinery, shall be charged to expenses, in like manner as the expenses of working the road.

The following summary embraces the conclusions at which the committee have arrived:

Assuming that the instalments due upon the shares will have been paid, the debt of the company, which we have supposed would amount, at the completion of the improvements, with our present means to.....\$3,667,000
Will have been reduced about..... 550,000

Leaving a balance of debt, of.....\$3,117,000
And the 38,810 shares of stock at \$100
would be..... 3,881,000

Making the capital.....\$6,998,000

Or in round numbers \$7,000,000. In this estimate of capital we have excluded the \$448,000 of income and the \$311,000 of forfeitures, expended on the road; and also our proportion of the Camden branch. It represents the capital upon which interest is paid or dividends expected.

We have already seen that the average annual increase of the receipts of the road have amounted to nearly \$75,000. The last year's increase was \$92,070. We may, therefore, safely estimate the Gross income of 1851, at.....\$1,075,000
60 per cent. of which, for all expenses
as already explained, would be..... 642,000

And will leave a net profit of..... \$423,000
being a fraction over 6 per cent per annum, on the estimated capital.

But \$2,000,000 of our debt bears an interest of only five per cent. If, therefore, the interest of the debt be first charged, and the balance of net profit be divided on 38,810 shares, it would amount to 6 7-10 per cent.

Immigration.

An abstract of the Parliamentary returns shows that the number of emigrants from the United Kingdom in 1846 was 159,851, of whom 87,611 were from England, 3,427 from Scotland and 38,813 from Ireland. Of these 82,239 went to the United States, 43,439 to the North American Colonies, 488 to the British West Indies, 2,377 to the Australian Colonies, and the remainder to various places, foreign and British.

In 1847, the total number of emigrants was 258,270, of whom 153,898 were from England, 8,616 from Scotland, and 95,756 from Ireland. Of these 142,154 went to the United States, 109,880 to the North American Colonies, 364 to the British West Indies, 4,949 to the Australian Colonies, and the remainder to various other places.

In 1848, the total number of emigrants was 248,

of whom 176,883 were from England, 11,595 from Scotland, and 59,701 from Ireland. Of these, 189,233 went to the United States, 81,065 to the North American Colonies, 855 to the British West Indies, 23,622 to the Australian Colonies, 1,180 to the East Indies, 1,445 to the Cape of Good Hope, and the remainder to various places in very small numbers.

The Journal of Commerce gives, from an authentic source, the annexed statement, showing the number of vessels and passengers which have arrived at the port of New York from foreign countries during the past 15 years:

Year.	No. of arrivals.	No. of passengers.
1835.....	2,094	35,303
1836.....	2,291	60,541
1837.....	3,071	57,975
1838.....	1,790	25,581
1839.....	2,159	48,152
1840.....	1,953	62,797
1841.....	2,118	57,337
1842.....	1,960	74,949
1843.....	1,839	46,302
1844.....	2,308	61,002
1845.....	2,044	82,960
1846.....	2,293	115,230
1847.....	3,147	166,110
1848.....	3,060	191,909
1849.....	3,227	221,799

The number of passengers arrived during the past year is unprecedented, exceeding by 29,890 the extraordinary number in 1848, nearly double the immigration of 1847, and nearly treble that of any previous year. Judging from the number arrived at New York, (221,799) we should infer that the number arriving in the whole United States by sea, including California, must be 325,000 to 350,000; in addition to which, many thousands have entered our territory from Canada.

Pennsylvania.

Report of the Board of Canal Commissioners.—The Board of Canal Commissioners have submitted a report of the operations on the several lines of canal and railroad of the Commonwealth, for the year ending the 30th of November, 1849, from which we extract the following exhibit of receipts and expenditures:—

	RECEIPTS.	EXPENDS.
Phila. & Col. R. R.	\$582,750 37	\$291,855 86
Alleghany Portage.....	220,466 56	222,668 11
Main line of Canal.....	443,324 58	152,908 67
Delaware Division.....	196,714 25	32,518 20
Susqueh'a & N.W. branch	190,501 43	55,554 03
Deduct drawbacks.....	279 46	
Total receipts.....	\$1,638,277 72	\$758,500 87
Net receipts over expenses.....		\$8,74,776 65

The report is quite lengthy, interesting and important, showing that the improvements of the State promise much good to the public in future, as well as greatly increased revenue to the State.

Georgia.

South Western Railroad.—The following named gentlemen were chosen directors of the South Western railroad company for the ensuing year, at the late meeting of the stockholders in Macon:

L. O. REYNOLDS, President.

R. R. Cuyler,

J. W. Anderson,

Wm. A. Black,

David Kiddo,

A. H. Chappell.

Directors.

At the same meeting the second annual report of the directors was presented, from which we learn that the progress and condition of the work are most satisfactory. Thirty-seven and a half miles of the grading have been completed, leaving only 124 miles more to be done, and the superstructure has been commenced. We quote the following from the report:

"The total amount received, is \$432,806 10, and the amount expended \$321,268 06, leaving a balance in the treasury of \$111,538 04.

Included in the amount set down as expended, is the sum of \$56,551 84, which is credited to the contractors on their stock, and which is to remain in the hands of the company until the completion of their respective contracts.

By the statement of the Chief Engineer, also appended, you will learn that there has been done 1,428,816 cubic yards of excavation and embankment, and that there remains to be done, 450,869 cubic yards, being less than one quarter of the whole amount—in other words, there has been equal to about thirty-seven and a half miles graded, leaving about twelve and a half miles to be graded, to reach the depot on the western side of the Flint river. A large quantity of timber has been procured for the superstructure, and the laying is about to be commenced. Three thousand one hundred tons of iron rails, with the necessary connecting plates, have been purchased on very favorable terms, and a large portion of it delivered in Savannah. The quantity of iron is amply sufficient to iron the track to the point above mentioned, west of Flint river, fifty miles."

The report concludes as follows:

"The true policy of the company is therefore believed to be, to avoid encumbering itself with debt. We shall, however, be obliged to avail ourselves of the liberality of the Central railroad company, to a limited extent, in affording us the aid of its credit, to enable us to procure the necessary engines, cars and other machinery, to put the road in operation. It is proposed to make contracts immediately for these things.

Savannah and Augusta Railroad.—It is with sincere gratification that we announce that the contracts for constructing the Augusta Branch Railroad as far as Waynesboro' have been completed. The whole work, superstructure and all (the iron being already on hand,) is to be done in season for the trains to pass over by the 15th November next! The energy and character of the contractors, Dr. Collins and Messrs. J. D. Gray & Co., (the latter from the State Road,) are a good guaranty for the speedy execution of the work.—Dr. Collins has taken the first six miles, starting from the seventy-eight mile station, and Messrs. Gray & Co. the remainder. The terms are generally favorable to the company, varying, for excavation and embankment, from 10 to 15 cents per cubic yard. Within five days from this time the hands will be at work on the grading. The contracts were signed in this city yesterday.—*Sav. Rep., 17th.*

COMPARATIVE STATEMENT.

Showing the Tonnage of Vessels of every description in the United States and Great Britain:

Great Britain.

	No.	Tonnage.
Dec. 31, 1847.		
Sailing vessels.....	23,167	3,168,913
Steam Vessels.....	1,033	141,006
		3,309,919

United States.

June 30, 1848.....3,154,041

Comparative statement showing the shipping built in 1848:

Great Britain.

	No.	Tonnages.
Sailing vessels.....	733	107,218
Steam vessels.....	114	15,334
		122,552

United States.

	No.	Tonnage.
Sailing vessels.....	1,676	
Steam vessels.....	175	
		1,851
		318,078

The difference in the measurement of English and American vessels, does not permit us to make the comparison exact. Under their present regulations, English vessels are measured in detail,

showing the actual tonnage of each. The rule adopted in this country for Custom House measurement, by which the register is determined, is this—one-half the breadth of beam is assumed as the depth of the hold. This rule is purely arbitrary. The actual tonnage is greater or less, than Custom House measurement, according to the particular build of each vessel. A full ship, with a greater depth of hold than one-half the breadth of beam, exceeds in actual tonnage the amount stated in its register. A majority of American vessels that go to Liverpool, and are there measured, are found to exceed in tonnage from 10 to 20 per cent. the nominal amount given in their register.

Massachusetts.

Western Railroad.—The annual report of the directors of the Western railroad shows that its receipts for the year ending November 30th, 1849, were as follows:

From passengers.....	\$561,575 25
freight.....	745,393 81
other sources.....	36,841 51
	\$1,343,810 57

The expenditures were—

For road repairs.....	\$125,570 53
engine repairs.....	47,554 60
freight and passenger	
car repairs.....	57,998 13
buildings, etc.....	18,713 62
transportation exp....	303,843 26
general expenses.....	34,642 44
	588,322 58

Net earnings for the year.....\$755,487 99

The gross receipts of 1849 were \$12,000 more than in 1848, and the expenses \$64,000 less. The receipts from passengers were \$10,530 more than in 1848; from mails \$1,721 more; and from merchandise \$516 less.

The whole cost of the road has been \$9,936,951 78, as follows:

Graduation, masonry and bridging..	\$4,588,003 36
Superstructure.....	1,859,035 64
Station buildings.....	632,827 48
Land damages.....	501,782 39
Locomotives.....	362,000 00
Cars.....	560,587 43
Engineering and other expenses.....	1,432,714 78
	\$9,936,951 78

This cost has been provided for as follows:

Capital stock.....	\$5,150,000 00
Sterling bonds at 5 per cent.....	4,319,520 00
Albany bonds, 6 per cent.....	1,000,000 00
	\$10,469,520 00

There has been paid into the sinking funds the sum of \$459,578 62; and there is a balance of construction funds unexpended of \$82,989 60.

The number of through passengers in 1849 was 33,751, and of way passengers 402,053. The quantity of freight in 1849 was 81,728 going west, and 191,880 going east—being 673,608 tons moved; equivalent to 162,289 over the whole road. The number of barrels of flour conveyed was 590,165.

Pennsylvania.

Pittsburgh and Erie Railroad Company.—At an election held on the 11th inst., at the Reed House, Erie, the following named gentlemen were elected directed:—Charles M. Reed, M. Courtwright, William Kelley, James Williams, A. W. Brewster, D. Mc Allister, C. McSparran, James C. Marshall, John A. Tracy, P. Metcalf, John McClure, Jr., B. B. Vincent, Smith Jackson.

At a meeting of directors, subsequently held, C. M. Reed was elected President, and D. McAllister appointed Secretary and Treasurer.

We understand the prospects of this road are

very flattering. It has been taken hold of by men who, if we have not greatly mistaken their resources and character, will build the road within from three to five years. A portion of it will most likely be finished next year, or by the time our Western road is completed to the state line.

Exports of British Iron in 1848 & 1849.

The Parliamentary Returns, ending on the 5th of January of the years 1848 and 1849, show the exports of Iron for those years from the British Isles:—

	1848. Tons.	1849. Tons.
Pig iron.....	176,086	175,650
Bar iron.....	314,874	321,134
Bolt and rod iron.....	13,419	17,553
Cast iron.....	26,321	19,371
Iron wire.....	1,972	1,912
Wright iron anchors, grapnels, &c.	4,561	4,625
hoops.....	17,163	16,644
nails.....	5,735	5,709
other s'ts, exc't ordn'ce	74,036	49,384
Old iron for re-manufacture.....	5,571	7,241
Unwrought steel.....	9,786	6,912
	549,524	619,141

Hardware, cutlery, &c.....	20,614	18,105
Declared value of do.....	£2,341,980	£1,860,150
British machinery and mill		
work, declared value.....	£1,263,015	£817,656

Tennessee.

East Tennessee and Georgia Railroad.—The legislature has authorised the Governor to issue six per cent coupon bonds of the state to the amount of \$350,000, to aid in the purchase of iron and equipments necessary for the East Tennessee and Georgia railroad. The part of this road from Dalton to the Tennessee river, when completed, will cost a million and a half dollars. The interest of the state in it is \$426,500.—*Nashville Union, February 2.*

Statistics of the State of Michigan.

The following statistics of Michigan, we extract from Gen. Barry's message: The Secretary of State, in due time, will present you his report prepared in accordance with that provision of "An Act to provide for statistical information," approved April 3d, 1842. From this report much valuable statistical information may be obtained. The land under cultivation in the state in 1848, was 1,437,000 acres, of which 465,000 acres were sowed with wheat. The quantity of wheat raised was 4,739,390 bushels, and of all other grains 8,179,797 bushels; wool produced, 1,645,756 lbs. sugar made, 1,774,369 lbs.; in the State, 52,305 horses; 210,366 neat cattle; 152,541 swine; 649,534 sheep; 228 flouring mills; 568 run of stone; 719,478 barrels of flour made; 593 hands employed; \$1,496,400 capital invested; 730 saw mills, 157,179,257 feet of timber sawed; 1,959 hands employed, \$939,470 capital invested; and \$4,660,974 in merchandise imported, exclusive of Detroit. The Secretary of State supposes the reported amount invested in flouring and saw mills to be too small, but the report otherwise to be essentially correct. The returns also show in the State 18 deaf, 10 dumb, 71 deaf and dumb, 71 blind, and 120 insane.

Indiana.

We are informed that the Bellefontaine and Indianapolis railroad will be put under contract this spring, and that enough stock to justify it has been subscribed. This road commences where the Pittsburgh crosses the Cleveland and Columbus road—passing thence through Morrow, Bellefontaine and Sidney, to the Indiana State line.

We also learn that the railroad from Martinsville

to Franklin, and by extended connection with the Madison road, a few miles north of Edinburgh, has been nearly all put under contract; contractors taking 40 per cent. of the amount of the engineer's estimate in stock. The remainder will be taken up in the spring. This road is to be done by September, 1851.

Ohio.

The Columbus and Xenia railroad was open for travel on the 1st inst.

Connecticut.

New Haven and New London Railroad.—The New Haven Register states that a large meeting of the friends of a railroad from that city to New London, was held in New Haven on Wednesday. Contractors from different parts of the country submitted proposals for the immediate construction of the road, and the work is to be taken seriously in hand.

New Hampshire.

Concord Railroad.—At a meeting of the stockholders of the Cocheco railroad, held at the Town House, in Dover, Wednesday, Jan. 2d, the following directors were chosen: Wm. Hale, Geo. Mathewson, Joseph H. Smith and Thomas H. Cushing, Dover; Edward Crane and Stephen S. Stone, Boston; and John Barker, Farmington.—*Dover Gazette.*

Cocheco and Claremont Railroad.—About three-fourths of the grading, masonry and bridging between Warner and Bradford, has been completed, and the residue will be finished, ready for the track by the first day of May next.

DEATH OF SIR I. K. BRUNEL.

We have this month to record the death of this, in many respects, extraordinary man, best known by his great work, the Thames Tunnel. The *Times* has a short memoir of him, which we reprint as being a concise history of his origin and career:—"Sir Isambert Brunel was by birth a Frenchman; but his life and genius were almost wholly devoted to the invention and construction of works of great public utility in this country. He was born at Hacqueville, in Normandy, now in the Department de l'Eure, in the year 1769. He was educated for the church, with the prospect of succeeding to a living, and was accordingly sent at an early age to the seminary of St. Nicain, at Rouen. But he soon evinced so strong a predilection for the physical sciences, and so great a genius for mathematics, that the superiors of the establishment recommended he should be educated for some other profession. Accordingly, at the proper age, he entered the royal navy, made several voyages to the West Indies, and returned home in 1793. At this time the French Revolution was at its height, and as Mr. Brunel entertained royalist opinions, he emigrated to the United States, where necessity, fortunately, compelled him to follow the natural bent of his mind, and to adopt the profession of a civil engineer. He was first engaged to survey a large tract of land near Lake Erie. He was employed in building the Bowery Theatre in New York, which not many years ago was burnt down. He furnished plans for canals, and for various machines connected with a cannon foundry then being established in the state of New York. About the year 1799, he had matured his plans for making ship blocks by machinery. The United States was not then the field for so inventive a genius as Brunel's. He determined upon visiting England, and offering his services and plans for this purpose to the British Government. Lord Spencer, then, we believe, First Lord of the Admiralty, became his friend and patron. From this time he continued to reside in England, and refused to entertain many propositions made to him to leave this country and settle abroad under auspices of other governments. After much opposition to his plans, he was employed to execute them in Plymouth Dockyard. To perfect his design, and to erect the machinery

was the arduous labor of many years. With a true discrimination, he selected Mr. Henry Maudslay to assist in the execution of the work; and thus was laid the foundation of one of the most extensive engineering establishments in the kingdom, and in which, perhaps, a degree of science and skill had combined and applied to mechanical invention and improvement scarcely exceeded by any other in the world. The block machinery was finished in 1806; and has continued ever since in full operation, supplying our fleet with blocks of good description to those previously in use, and at a large annual saving to the public. A few years afterwards he was employed by government to erect sawmills, upon a new principle, in the dock-yards of Chatham and Woolwich. Several other inventions were the offspring of his singularly fertile mind about this time; the circular saws for cutting veneers of valuable woods, and the beautiful little machine for winding cotton thread into balls, which greatly extended its consumption. About two years before the termination of the war, Mr. Brunel, under the countenance of the Duke of York, invented a machine for making shoes for the army by machinery, the value and cheapness of which were fully appreciated, and it was extensively used—but the peace of 1815 lessening the demand, the machinery was ultimately laid aside. Steam navigation, also, at that time attracted his attention. He was engaged in building one of the first Rams-gate steamboat, and, we believe, introduced the principle of the double engine for the purpose. He also induced the Admiralty to allow him to build a vessel to try the experiment of towing ships out to sea, the possibility of which was then denied. The visit of the Emperor Alexander to this country after the peace led him to submit to the emperor a plan for making a tunnel under the Neva, where the accumulation of ice, and the suddenness with which it breaks up on the termination of winter, rendered the erection of a bridge a work of great difficulty. This was the origin of his plan for a tunnel under the Thames, which had been twice before attempted without success."

AMERICAN RAILROAD JOURNAL.

Saturday, March 2, 1850.

The Railroad Journal.

The American Railroad Journal was the earliest work published in any part of the world devoted to the railway interest. In its pages is to be found the only full and complete history of railway progress, the only authentic record of the discoveries and improvements which the greatest of practical science has drawn forth and perfected.

The means of enhancing its value under its present proprietorship are far greater than when we assumed its charge about one year ago. It will continue to furnish the best practical results as to the construction and working of railroads, the details of progress in steam navigation, commerce, mining, manufactures, banking and the mechanic arts.

The best practical talent that can be enlisted in the country is engaged to supply its pages. The mining interest will find evidence of the first systematic attempt to give a full view of the iron, copper and lead ores of the country, with the results of practical working. In all the branches of mechanical industry we seek to discard the crude conceits of unskilled pretension, the thousand useless novelties issuing from the Patent Office, and to give encouragement to whatever can be made useful in relieving the wants, in ministering to the pleasures, or contributing to the advancement of the race.

We invite contributions to its pages from all who sympathise in our labors, information in any form from those most interested in the progress of mechanical invention, and substantial support from all who are willing to aid us in the arduous duties of our position.

Condition of Railway Property.

The elaborate and carefully written article in last week's paper from the Companion to the British Almanac for 1850, must have attracted the attention of the readers of the Journal. It is a source of regret that, in this country, information necessary to a similar review of the condition of railway property, should be still so incomplete and defective.

We have more than once urged upon the attention of the Legislatures of the different States, the importance of a law requiring returns from the several companies, similar to those made by the English railroads. The returns of New York roads for the past year are an improvement upon those of former dates.

The returns of the Massachusetts roads, soon to be published, will contain more specific information than those of previous years.

The Massachusetts law is defective, in not requiring a statement showing the cost of transporting passengers and the cost of transporting freight. Until this information is given, the means of applying the proper remedies to the correction of errors in the management of railways cannot be obtained from the reports of the respective companies.

The Massachusetts railroads, and in fact nearly all the New England roads which connect with Boston, and are known as the Boston roads, are at the present time in a comparatively depressed condition.

The following table shows the comparative prices of the leading railroad stocks in Boston within about two years:—

	Mar. 31. 1848.	Mar. 31. 1849.	Mar. 1. 1850.
Boston and Lowell.....	114½	112	115
Boston and Maine.....	117½	103½	103½
Boston and Worcester.....	117	105½	94
Boston and Providence.....	100	89	86
Fitchburg.....	117½	109	107½
Western.....	104	100½	102½
Eastern.....	106	99½	95
Vermont Central.....	76	53½	43½
Northern, (N. H.).....	97	80½	65
Old Colony.....	95	80½	66
Cheshire.....	84	73	55
Passumpsic.....	98	85	68
Norfolk Co.....	100	57½	58
Vermont and Mass.....	74	45½	37

This presents an extraordinary decline of prices, which is without parallel in the history of New England enterprise.

The cause of this decline can be stated in very few words—an over-supply of railway lines. There is no doubt that commercial embarrassment in Boston has been produced by an over-investment in railways, and this embarrassment has acted with extraordinary force upon the value of railway shares. Still, all sound, dividend, six per cent. paying railroad stocks continue to maintain in Boston market their position with the ordinary securities of the day.

There is no longer any question on the minds of any one that Boston has put too much money into railroads as a mode of investment, or for motives of speculation. Her importance has been thereby increased, and her business has been enlarged by the construction of her wonderful net work of railways. The real misfortune has been the speculative movements with a view to invite the investment of money in railways, from capitalists. The present reaction is a necessary consequence resulting from this condition of things. In New York the operations in railway shares at the stock exchange has exhibited no such extraordinary results. A large majority of the railway stocks have main-

tained a comparatively uniform price. The Utica and Schenectady railroad stock has advanced from 120 to 125 during the past year, and the Syracuse and Utica from 120 to 130. The New York and New Haven from 90 to 97½.

Without extending these remarks further, they will furnish suggestions to those engaged in railway schemes, and admonish them not to multiply railway lines with a view to investment of capital beyond the ability of the community to construct them, without embarrassment to ordinary business, or beyond the capacity of the road ultimately to earn a fair dividend upon their cost.

Mr. Detmold requests us to make the following corrections in his communication, which appeared in our paper of the 9th ult.:—

In the 4th line of the second column, for "concocting" read concerting.

In the 39th line same column, "for assurances" read assurance.

In the 2d page, 2d column, in the 47th line, read phosphate instead of "phosphate."

In 15th line from the bottom of last column, read Vanquelin for "Vanguelin."

In the 27th line from the bottom of the 3d column, read "that it is" instead of "this is."

In relation to appending his name as the writer of the review of Mr. Overman's work, which was done by us, we insert the following from Mr. D.'s letter.

"In conclusion, I must express my decided regret at seeing my name placed in the table of contents at the head of your Journal, as the author of the review of Overman. This is certainly as much against my wishes and expectations as it is contrary to editorial usage. Reviews and critiques are invariably anonymous; and in disregarding this wholesome custom in this instance, you expose me to the unjust suspicion of challenging a personal discussion with the author, which is certainly the last thing I should desire.

I am very resp'y yours,

C. E. DETMOLD."

St. Lawrence and Atlantic Railway.

A. T. Galt, Esq., Commissioner of the British American Land Company, and late Member of Parliament for Sherbrooke county, has been unanimously chosen President of the St. Lawrence and Atlantic railway, in room of Hon. A. N. Morin, resigned. Mr. Morin is Speaker of the Assembly, and the removal of the seat of government from Montreal to Toronto prevented Mr. Morin from retaining the situation of President of the railway, and Mr. Galt gave up his place in Parliament on account of the change of the seat of government.

John Young, Esq., of Montreal, was elected Vice-President of the company, and C. A. Webster, Esq., of Montreal, has been appointed Secretary and Treasurer. Under the guidance of its present able executive its whole line has been placed under contract, and under the same guidance its successful completion is no longer a matter of question or doubt.

Powerful Locomotive.

A correspondent writes to us from Cambridge, that Mr. Kirk has turned out from his establishment his second railroad engine, which mechanics declare to exceed anything of the kind in the country, and which, in its construction and finish, will take the place of all others in its advantages over common locomotives. It was built for the broad gauge of the Androscoggin and Kennebec railroad, to draw passengers, weighs 21 tons, its wheels are

5 feet 6 inches in diameter, cylinder 16 inches in diameter and 90 inches in stroke. The tender is capable of containing 1800 gallons of water, and the locomotive is warranted to draw the passenger train at the rate of 50 miles an hour. Our correspondent pays a high compliment to Mr. Kirk for the strength and finish of his machines for annihilating time and space, and states that he has in process of construction a locomotive for the Reading railroad, which, when finished, will be worthy of the examination of mechanics.—*Boston Courier.*

English Stocks—Consols.

On the 5th of January, 1846, the national funded debt of the United Kingdom of Great Britain and Ireland was £768,789,241 sterling, or 3,741,450,742 dollars. The revenue for the same year (regarded as the most prosperous—at any rate known to have been the year most renowned for the abundance of money for a whole century) was £53,060,353 sterling; the expenditure £49,242,713, leaving a surplus of income beyond expenditure of £3,817,640. The revenue for the year ending Jan.

5, 1847, was.....	£53,790,138
The expenditure for the year ending Jan. 5, 1847, was.....	50,943,830
The revenue for the year ending Jan. 5, 1848, was.....	51,546,265
The expenditure for the year ending Jan. 5, 1848, was.....	54,512,539
Showing an excess of expenditure above income of.....	2,956,265
The revenue for the year ending Jan. 5, 1849, was.....	53,388,717
The expenditure for the year ending Jan. 5, 1849, was.....	54,185,136
Showing an excess of expenditure above income of.....	796,419

The funded debt of the United Kingdom on the 5th of January, 1849, had reached the sum of £774,023,638 sterling, or £1,690,098 more than it was in 1829, or 20 years before. The unfunded debt was £17,794,700, making the national debt £791,817,338 sterling.

The public funds of Great Britain are now regarded as the commercial and financial barometer of the condition of trade. They are affected at once by political agitations or great commercial movements in any part of the world.

In looking at the foreign news, the first inquiry usually is, as to the price of consols. Consols is an abbreviated expression for the consolidated funds of the British government. Formerly, different loans were charged to a particular fund, as the *Aggregate Fund—South Sea Fund*, etc. Finally, in 1786 all these funds were by law united into the Consolidated Fund, during the administration of Pitt, the younger—bearing interest at the rate of 3 per cent., and the 3 per cent. Consolidated Funds thereafter took the name of consols.

The fluctuations in these funds indicate the state of the money market throughout Europe. In 1737 and 1739 the price of 3 per cents reached £107 for the £100; this was the highest price they have ever reached. They fell to 76 during the rebellion in 1745, but rose again to 100 in 1749. They did not reach *par* again till 1844, or nearly a whole century. Towards the close of our Revolutionary war, they fell to 54, and rose to 96 in 1792. In 1797 they fell to the lowest point ever known, 47½, in consequence of the success of the French in every direction, the general distress in England, and the alarm occasioned by the mutiny at the Nore. On the conclusion of the peace of Amiens in 1802 they rose to 79, but sunk to 50 on the breaking out

of the war in 1803. In 1806 they reached 66, in 1808 they rose to 70, and in 1810 to 72. The war with this country brought them down to 55 in 1812. They rose to 73 on the abdication of Napoleon in 1814, and fell to 55 again on his escaping from Elba. They rose again after the battle of Waterloo, and in 1817 were at 84. The trial of the Queen in 1820 caused them to fall to 65, but in 1824 they reached 97. They fell again to 74 in the panic of 1825, and again advanced gradually till they reached 91½ in 1830, but fell to 77½ in 1831. From 1831 to 1844 there was a steady advance with slight variations, when they reached 100½ in October, and 100½ in December, 1844.

Several times in 1845 they stood at *par*, though they receded to 96½ in October, and to 93½ at the close of 1845. In 1846 they reached 97½. In 1847 they declined to 77, but reached to 86 in December of that year. They had reached 89½ in Jan. 1848, but fell to 81½ on the breaking out of the French Revolution in February of that year. They reached 89½ in December, 1848, and rose to 93½ in September, 1849. By the most recent arrival, the America, the price of Consols had reached 96½ on the 1st day of February last.

Pacific Railroad.

The St. Louis Revueille, in a long article upon the subject of the Pacific railroad, estimates the cost of the work to Jefferson city at \$25,000 per mile, and from thence to the boundary at \$20,000 per mile; a liberal estimate, but not too high probably, for the class of road that should be constructed to accommodate the enormous amount of business it would be called upon to perform, and to make it a suitable link of the great line to the Pacific. In relation to route, etc., the Revueille says:

"The structure of the country, as well as the mineral resources in our neighborhood, concur in indicating a line for this railway, which will diverge far enough south of a due west course to penetrate the valley of the Merremac river, and follow it a sufficient distance to afford easy and cheap access to it by means of branches or otherwise, and pass from thence on the most practicable and direct course to the mouth of the Kansas river. It is a moderate estimate to state, that along this line there are at present distributed two hundred thousand people, whose whole import and export trade must be carried on by means of this road for five months of the year, and at least one hundred thousand whose trade will be conducted upon it throughout the year. During the past season three hundred and fifty five steamboats either ascended or descended the Missouri river. With a railway, it is a moderate calculation to say, that two thirds of their tonnage would find a market upon it, because the greater part of the hemp and tobacco would seek one during the winter months. One hundred thousand tons is a low number to count as at present ascending and descending the river.—The average distance which this freight would be carried would probably be about one hundred and fifty miles. At the usual rate of four cents per ton per mile, this would yield a revenue of \$600,000. The number of passengers during the year, independent of the augmentation produced by the California fever, is probably twenty thousand. If we add to this number the increase already known, this number will be swelled to about thirty thousand. These, at the rate of \$7 to the border, (a low price) would yield \$210,000. Total income upon present population, products and passengers, \$810,000.—The history of railway improvements justifies us in the conclusion, that all these sources of revenue

would be quadrupled before the railway can be completed. If this be true, the first annual income of the road would be \$3,240,000. Suppose that one half this revenue is consumed in repairs and expenses, and we have left \$1,620,000. And is there any one who does not know that the value of all the lands, the products of which would find a market upon this railway, would be more than quadrupled by its construction? And is it not obvious that the main reason of its increase of value would be because of the greater quantity brought into cultivation, the more skilful cultivation, and the consequent augmentation of production?

In the foregoing remarks we have said nothing of the vast mineral treasures, which can only be brought into market through the instrumentality of a railway. It is believed by the best judges that there is a large amount of iron, ore of copper, and of bituminous and carmel coal embosomed in what is called the mineral region of Missouri than can be found within the same space in any other portion of the globe. With a railroad, capital would instantly seek investment there, and all these ores would be worked with vast profits to the miner, and incalculable advantage to the community. We hesitate not to declare that, in our opinion, the mineral region alone would more than justify the construction of a double track railway of the best class."

Cast Iron Rails.

MESSRS. EDITORS: In your valuable periodical of the 16th inst., is an article upon the subject of cast rails, which I am pleased to see you favor. I have for a long time looked upon it as a "fixed fact," to use a phrase of the day, that cast rails are as certain to be introduced to common use, as it is certain that rails will be used at all. My reasons are, that the cost will be reduced at once about 50 per cent. Next, that when they are adopted, foreign rails will be excluded almost wholly by them, and lastly, if it be true, as alleged, that the lamination of a wrought rail is destroyed by use, and granulation takes place, we might as well use cast iron at once.

It is amazing that there should be so much ignorant respecting the iron manufacture. I do not mean with the public generally, but in the trade itself, and not only in this country, but all over the world. Until recently, iron men as a class, have been almost uniformly wealthy. Yet with the command of vast means among them, scarcely one seemed to apply his wits or his money thoroughly to learn his own business. This business has been pursued all over the civilized and semi-civilized world since the earth was first inhabited, and yet, until recently, the learning and practical sense of those engaged in it have been as stationary, as the practise of medicine since the days of Galen.

Who knows now anything of the art and mystery of mixing ores? This indeed is "the point" to which science and practical good sense should direct its unremitting attention, for upon this question alone depends the adoption of the cast rail.—Let it only once be known that the iron master can bring from his stack a pig of any required tenacity and hardness, and your rail mills are silenced forever. Will this be accomplished? Undoubtedly, for there is now more mind and more invention applied to this very subject, than there ever was before, and it will be accomplished. In fact I have not the slightest doubt that the manufacture of iron, if party spirit do not cause the government to play step-mother with this great interest, will be in a few years so improved, that for one half of the pre-

tical purposes that we now use wrought iron, cast iron will be substituted.

I observe that you set down the strength of cast iron as one-ninth less than wrought iron, and its expense at one-third less. Haswell fixes cast at 1, and wrought at 1-12, as the proportions. My own impression is, that these estimates are all vague, and that nothing less than a series of well tried and careful experiments made under the direction of government, with iron of the most approved ores, and made in the most approved manner, both with charcoal and anthracite, will throw any light upon this subject. How little reliance is to be placed upon what we do know, may be inferred from the fact, that when the Britannia and Conway tubular bridge was to be constructed, the most scientific and intelligent men knew nothing, absolutely nothing, of the proper shape or size of the iron needed, nor of the right mode and manner of putting it together. In fact, they seemed to know none of the simplest principles which were afterwards ascertained by a long series of troublesome and expensive experiments, to govern this material. My object therefore in writing to you is, to attract if possible some attention to the subject, and to ascertain if any experiments have been made, with what degree of care, and their results; and finally, if possible, to induce some able company or the government to go into a series of experiments under competent direction, which shall embrace the whole ground satisfactorily.

There has been some experimenting upon the Philadelphia and Columbia railway, but I should place but slight reliance upon it, as the road is under party direction, and the changes are very frequent, and the appointments not likely to be made for scientific attainments, or those qualities which should be possessed by a person fit to take charge of such experiments. The subject indeed is sufficiently grand in its aspects to induce Congress to make a special appropriation for it, did sensible subjects at all occupy their attention. Hoping you will continue the agitation of this subject, and gather new light upon it,

I remain truly yours, T. C. H.

Wheel, Forge and Foundry Iron.

LOCUST GROVE Wheel Iron of great strength and superior chilling property.

Balt. Charcoal Forge Iron, from Patuxent, Curtis Creek and Gunpowder furnaces.

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HENRY J. IBBOTSON, Agent,
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February 25, 1850.

CAUTION.

RAILROAD COMPANIES and others are hereby cautioned against using or vending our improvement for easing the lateral motion as applied on Railroad Cars. Letters Patent having been granted to us in 1841, any party or parties so making or using said improvement without license from us will be proceeded against according to law.

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A MILLION OF DOLLARS

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This fund is rapidly increasing, by a widely extended and prosperous business.

The company declared a dividend of profits of fifty-two per cent. on all existing policies on the 31st of January, 1848.

All the Profits are Divided Among the Insured.

The premiums are payable in Cash annually, semi-annually, or quarterly, interest being added on the deferred payments.

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Persons may effect insurance on their own lives and the lives of others.

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Clergymen and all others dependent upon salaries or their daily earnings are specially invited to avail themselves of a resource whereby their surviving families may be secured from the evils of penury.

Pamphlets explanatory of the principles of Mutual Life Insurance, and illustrating its advantages, with forms of application, may be obtained at the office of the company, 35 Wall street, or of any of its agents.

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WHISTLER MONUMENT Association.

MAJOR T. S. BROWN having, in leaving this country, resigned his office as Treasurer of this Association, the Committee appointed for that purpose have selected as his successor **GEO. M. DEXTER**, Esq., of Boston.

Those desiring to subscribe will therefore please direct their communications to Geo. M. Dexter, Civil Engineer, etc., Boston, Mass.

A. W. CRAVEN, Secretary, etc.
New York, February 22, 1850.

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1,500 Tons weighing 53 lbs. per lineal yard.

500 " " 57 " "

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Also 2½x½ flat rails. All the above being of approved patterns. For sale by

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CUT NAILS OF BEST QUALITY, BAR IRON (including Flat Rails) manufactured and for sale by
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CENTRAL RAILROAD FROM SAVANNAH TO MACON, (Ga.) 190½ miles.

Passenger Trains leave Savannah and Macon daily at 7 a.m.

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This road, in connection with the Macon and Western road from Macon to Atlanta, and the Western and Atlantic road from Atlanta to Dalton, now forms a continuous line of 391½ miles in length* from Savannah to Dalton, Murray county, Ga. and with the Memphis Branch railroad, and Stages connect with the following places:

Tickets from Savannah to Macon,	\$5 75
" " " Atlanta,	9 50
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" " " Opelika,†	17 00
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" " " Tusculum, Ala.,	22 50
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An extra Passenger Train leaves Savannah on Saturdays, after the arrival of the Steam-ships from New York, for Macon, and connects with the Macon and Western railroad; and on Tuesdays, after the arrival of the Macon and Western cars, an extra Passenger Train leaves Macon to connect with the Steam ships for New York.

Stages for Tallahassee and intermediate places connect with the road at Macon, Mondays, Wednesdays, and Fridays, and with Milledgeville at Gordon daily.

Passengers for Montgomery, Mobile and New Orleans take stage for Opelika from Barnesville through Columbus a distance of 97 miles, or from Griffin thro' West Point, a distance of 93 miles.

* The Western and Atlantic railroad will soon be completed between Dalton and Chattanooga, a distance of 423½ miles from Savannah, of which due notice will be given.

† Head of the West Point and Montgomery railroad, on which the fare to Montgomery is about \$2.

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Measurement Goods.—Boxes of hats, bonnets, furniture, shoes, saddlery, dry-goods, and other measurement goods, per cubic foot 13 cents.

Crockery Ware, in crates, boxes or hhd., per cubic foot. 10 "

Goods by Weight, 1st class.—Boxes of glass, paints, drugs & confectionary, per 100 lbs., 50 "

2d class.—Sugar, coffee, rope, butter, cheese, lard, tobacco, leather, hides, copper, sheet and hoop iron, tin, hard and hollow ware, rice, boxes soap and candles, bagging, and other heavy articles not enumerated below, per 100 lbs., 45 "

3d class.—Flour, bacon, liquors, pork, beef, fish, tallow and beeswax, per 100 lbs., 40 "

4th class.—Mill-gearing, pig and bar iron, grind and millstones, nails, spikes and coal, 100 lb., 50 "

Barrels of beets, bread, crackers, potatoes, ice, fruit, oysters, onions, and all light bbls, each, 75 "

Oil and molasses per hhd., (smaller casks in proportion) \$6 00 "

Salt per sack not exceeding 4 bushels, 50 "

Goods consigned to Thos. S. Wayne, Forwarding Agent, Savannah, will be forwarded free of commission. WM. M. WADLEY, Supt. Savannah, Ga., February 24, 1850.

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N. B.—Members of the profession, and others wishing to become subscribers, are requested to send their names without delay to the author, as below, as the publication of the names of Subscribers in one of the early Parts has been determined on, and no more copies of the work will be printed than are found necessary to supply Subscribers. Parties remitting \$9, the cost of First or AMERICAN DIVISION of the work, shall receive it monthly as published, POST FREE, in any part of the United States. To those remitting \$5, and the remainder in six months, it will be sent regularly as published, POSTAGE UNPAID.

Engineers in charge of Railroad Works, are respectfully requested to send Drawings of Bridges, &c., with the Specifications, Bills of Timber, Iron, &c., to GEORGE DUGGAN at his residence No. 179 Henry Street, New York, with a view to their insertion in this work.

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STEPHEN H. LONG, Patentee.

Louisville, December 10, 1849

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February 9, 1850.

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Railroad Iron Wanted.

VIRGINIA AND TENNESSEE R.R. OFFICE,
Lynchburg, January 25, 1850.

PROPOSALS will be received at this office, until the 1st of March next, for the delivery in Lynchburg, of iron rails for the Virginia and Tennessee Railroad, to be manufactured in or near this town, of Virginia Iron.

The said iron to be made of the best pig metal, and to be delivered at the following times and in the following quantities, viz: six thousand tons in the year 1851, and the remainder (about 15,000 tons) for the whole road, equally in the years 1852 and 1853.

Separate proposals will also be received for the delivery in Lynchburg, of pig metal, at times and in quantities sufficient for the manufacture of the rails above mentioned, said delivery to commence as early as the 1st of November, 1850.

The rails and pig metal will be subjected to strict inspection—the rails are to weigh about 60 lbs per yard.

At the same time proposals will be received for the above quantity of iron, manufactured any where else in America, or in England, to be delivered in Lynchburg or Richmond, under the same general conditions as those prescribed for Virginia Iron, manufactured at Lynchburg. Satisfactory security will be required.

By order of the Board of Directors.

CHAS. F. M. GARNETT,
Chief Engineer.

Ogden & Martin's ROSENDALE CEMENT.

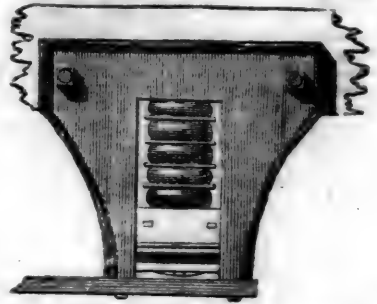
WE are prepared to enter into arrangements for supplying our Cement for public works or other purposes. We warrant the cement equal in every respect to any manufactured in this country. It attains a great degree of hardness, sets immediately under water, and is a superior article for masonry coming in contact with water, or requiring great strength.

For sale in tight barrels, well papered, at their office by
OGDEN & MARTIN, 104 Wall st.

February 16, 1850.

The above cement is used in most of the fortifications building by government.

FULLER'S PATENT INDIA RUBBER SPRING.



THESE SPRINGS ARE THE CHEAPEST, the lightest and most durable of any yet known. They are easily applied to new or old cars, and there is small possibility of any accident occurring to them.

Other parties through Mr. Ray set up claims to an India Rubber Spring which, though the same in principle, is very inferior in its working and durability. Actions are in progress for an Infringement on Fuller's Patent against parties using that Spring.

The superiority of Fuller's Spring over that claimed by Mr. Ray is fully established and has frequently been testified to. The following are from gentlemen who have had much experience with both Springs.

"It will afford me pleasure to recommend your springs to the companies in this region, in preference to Ray's which I am confident are inferior in mechanical arrangement to yours." JOHN M'RAE,
Engineer S. Carolina R. R., Charleston.

"I do not hesitate to allow you to say that I concur in Mr. M'RAE's opinion that Ray's springs are inferior in mechanical arrangement to Fuller's. I repeatedly expressed that opinion long before Mr. M'RAE had seen your springs (as I believe) and entertain it still." WM. PARKER,
Gen'l Supt. of Baltimore and Ohio R. R.

Office of Sup't Norwich & Worcester R.R. Co.,
December 26, 1849.

"I most fully concur in the opinion of Jno. McRAE, Engineer of S. Carolina Railroad, that 'Rays Springs are inferior to Fuller's Springs,' and shall with pleasure recommend them to all Railroad Companies for adoption. I have used both springs on this road and have no hesitation in saying that I should in all cases prefer Fuller's Spring."

SAM'L H. P. LEE, JR.,
Supt & Engineer.

Office B. & P. R. R. Co.,
Boston, 20th December, 1849.

"This company have cars fitted up with both Ray's and Fuller's 'Metallic India Rubber Springs,' and I do not hesitate to say that Fuller's arrangement is very much superior to Ray's."

W. RAYMOND LEE, Supt.

The following result has been obtained by experiment upon one railroad.

A set of Trucks fitted with Steel Springs cost \$100.77 and weigh 2355 lbs.		
The same with Fuller's Springs,	131.71	1911 lbs.
Difference,	\$69.06	444 lbs.

Not only is there an advantage in the cost, but owing to the great reduction in weight, the car can be made lighter throughout, and so an enormous saving in weight may be effected in a Train.

G. M. KNEVITT, 33 Broadway, N. Y.,
General Agent for the U. S.

The Springs can also be had of
JAMES LEE & CO., 18 India Wharf, Boston, &
JAS. THORNLEY, 110 Chestnut St., Philad.
January 2, 1850.

Railroad Iron.

2,000 Tons Heavy Rails, 57 and 61 lbs. per lineal yard, in store, and to arrive, within 30 days.

500 Tons 2 1/4 x 1/2 inch flat Rails.

1000 Tons 56 lbs. per lineal yard.

For sale by DAVIS, BROOKS & CO.,
No. 68 Broad street.

February 2, 1850.

NOTICE TO Superintendents of Railroads.

TYLER'S PATENT SAFETY SWITCH.—The undersigned would respectfully call their attention to his Patent Safety Switch, which from long trial and late severe tests has proved itself perfectly reliable for the purpose for which it was intended. It is designed to prevent the train from running off when the switch is set to the wrong track by design or accident. The single rail or gate switch is established as the best and safest switch for the ordinary purpose of shifting cars from one track to another, but it is liable to the serious evil of having one track open or broken when connected with the other. My improvement entirely removes this evil, and while it accomplishes this important office, leaves the switch in its original simplicity and perfection of a plain unbroken rail, connecting one track with the other ready for use.

The following decision of the Commissioner of Patents is respectfully submitted to Railroad Engineers, Superintendents, and all others interested in the subject.

(COPY.)

UNITED STATES PATENT OFFICE,
Washington City, D.C., April 28th, 1846.

Sir: You are hereby informed that in the case of the interference between your claims and those of Gustavus A. Nicolls, for improvements in safety switches—upon which a hearing was appointed to take place on the 3d Monday in March, 1846, the question of priority of invention has been decided in your favor. Inclosed is a copy of the decision. The testimony in the case is now open to the inspection of those concerned.

Yours respectfully,
EDMUND BURKE,
Commissioner of Patents.

To Philo B. Tyler.

Any further information may be obtained by addressing P. B. TYLER, Springfield, Mass., or JOHN PENDLETON, Agent, 149 Hudson St., New York.

Brown's Old Established SCALE WARE HOUSE, NO. 234 WATER ST., NEW YORK.

THE Subscriber, Practical Manufacturer of Scales of every description, respectfully asks the attention of Railroad Companies to his Improved Wrought Iron Railroad Track and Depot Scales which for strength, durability, accuracy, convenience in weighing, and beauty of workmanship, are not surpassed by any others in this country.

He is aware that this is rather a bold assertion for him to make, yet he can say with confidence that they have but to be tried to give them precedence over all others.

J. L. BROWN.

Bank Scales made to order, and all Scales of his make Warranted in every particular.

References given if required.

4tf

ENGINEERS.

Arrowsmith, A. T.,

Buckfield Branch Railroad, Buckfield, Me.

Banks, C. W.,

Civil Engineer, Vicksburg, Miss.

Berrien, John M.,

Michigan Central Railroad, Marshall, Mich.

Buckland, George,

Troy and Greenbush Railroad.

Clement, Wm. H.,

Little Miami Railroad, Cincinnati, Ohio.

Cozzens, W. H.,

Engineer and Surveyor, St. Louis, Mo.

Davidson, M. O.,

Eckhart Mines, Alleghany Co., Maryland.

Fisk, Charles B.,

Cumberland and Ohio Canal, Washington, D. C.

Felton, S. M.,

Fitchburg Railroad, Boston, Mass.

Floyd-Jones, Charles,

South Oyster Bay, L. I.

Gzowski, Mr.,

St. Lawrence & Atlantic Railroad, Montreal, Canada.

Gilbert, Wm. B.,

Rutland and Burlington Railroad, Rutland, Vt.

Grant, James H.,
Nashville and Chattanooga R. R., Nashville, Tenn.

Harry, P.,

Binghamton, New York.

Holcomb, F. P.

Southwestern Railroad, Macon, Ga.

Higgins, B.

Mansfield and Sandusky Railroad, Sandusky City, O.

Johnson, Edwin F.

New York and Boston Railroad, Middletown Ct.

Latrobe, B. H.,

Baltimore and Ohio Railroad, Baltimore, Md.

Miller, J. F.,

Worcester and Nashua Railroad, Worcester, Mass.

Morris, Elwood,

Schuylkill Navigation, Schuylkill Haven, Pa.

Morton, A. C.,

Atlantic and St. Lawrence Railroad, Portland, Me.

McRae, John,

South Carolina Railroad, Charleston, S. C.

Nott, Samuel,

Lawrence and Manchester Railroad, Boston,

Prichard, M. B.,

East Tennessee and Georgia R. R., Cleveland, Tenn.

Reynolds, L. O.,

Central Railroad, Savannah, Ga.

Roebbling, John A.,

Trenton, N. J.

Roberts, Solomon W.,

Ohio and Pennsylvania Railroad, Pittsburgh, Pa.

Robinson, James P.,

Androscoggin & Kennebec Railroad, Waterville, Me.

Sanford, C. O.,

South Side Railroad, Virginia.

Schlatter, Charles L.,

Northern Railroad (Ogdensburg), Malone, N. Y.

Sours, Peter,

Railway, New Jersey.

Stark, George.,

Bost., Con. and Mont. R. R., Meredith Bridge, N. H.

Steele, J. Dutton,

Pottstown, Pa.

Trimble, Isaac R.,

Philad., Wil. & Baltimore Railroad, Wilmington, Del.

Tinkham, A. W.,

United States Fort, Bucksport, Me.

Thomson, J. Edgar.,

Pennsylvania (Central) Railroad, Philadelphia.

Whipple, S.,

Civil Engineer and Bridge Builder, Utica, N. Y.

Williams, E. P.,

Auburn and Senectady Railroad, Auburn, N. Y.

Williams, Charles H.,

Milwaukee, Wisconsin.

Wormeley, Preble,

Central Ohio Railroad, Zanesville, Ohio.

HOTELS.

JONES' HOTEL,

NO. 152 CHESTNUT STREET,
PHILADELPHIA.

BRIDGES & WEST, Proprietors.

DUNLAP'S HOTEL,

On the European Plan,
NO. 135 FULTON STREET,
Between Broadway and Nassau St.,
NEW YORK.

BUSINESS CARDS.

Nathan Caswell,

METAL BROKER, 69 WALL ST., N. Y.

For the Purchase and Sale of Railroad Iron (new and old,) Boiler Plates, Pig and Bar Iron, Lead, Tin, Copper, Spelter, etc. Refers to

Messrs. Boorman, Johnston, & Co., New York.

" Grinnell, Minturn & Co., "

" Barston, Pope & Co., "

" Earps & Brink, Philadelphia.

" E. Pratt & Brother, Baltimore.

John Barstow, Esq., Providence.

Lewis Bullard, Esq., Boston.

February 9, 1850.

6m*

VanRensselaer Stevens,

Sup't Transportation Providence and Worcester R.R., Providence, R.I. Has had 13 years' experience in Operating Railroads. Will go South or West if applied to.

J. & Riley Carr,

Manufacturers of Cast, Shear, German and Blister

STEEL,

Of all Descriptions, Warranted Good.
BAILEY-LANE WORKS, SHEFFIELD.

R. S. DENTON, Agent,

NO. 20 CLIFF ST., NEW YORK.

STEEL AND FILES.

R. S. Denton,

20 CLIFF STREET, NEW YORK,

AGENT FOR

J. & Riley Carr's

BAILEY-LANE WORKS, SHEFFIELD,

Manufacturers of Cast, Shear, German and Blister

STEEL

Of all descriptions. Warranted Good

FILES.

Manufacturers of Machinists' Warranted Best Cast Steel Files, expressly for working upon Iron and Steel, made very heavy for recutting.

A full Stock of Steel and Files at all times on hand. 6m4

Cumberland, (Md.,) Coals for Steaming, etc.

ORDERS RECEIVED FOR AND FILLED
by J. COWLES, 37 Wall St., N. Y.

George O. Robertson,

BROKER IN SCOTCH AND AMERICAN PIG IRON;

Bar Iron, Lead, Spelter, Tin, Copper, etc.,

No. 4 Liberty Place, MAIDEN LANE,

(Near Broadway.)

NEW YORK

Manufacture of Patent Wire ROPE AND CABLES,

For Inclined Planes, Suspension Bridges, Standing Rigging, Mines, Cranes, Derrick, Tilters, &c., by

JOHN A. ROEBBLING, Civil Engineer,

TRENTON, N. J.

Samuel D. Willmott,

MERCHANT, AND MANUFACTURER OF
CAST STEEL WARRANTED SAWS,

IMPORTER OF THE

GENUINE WICKESLY GRINDSTONES

NO. 8 LIBERTY STREET,

NEW YORK.

Doremus & Harris,

ANALYTICAL & CONSULTING CHEMISTS,
179 BROADWAY, NEW YORK.

SCHOOL OF CHEMISTRY.

Dudley B. Fuller & Co.,

IRON COMMISSION MERCHANTS,

No. 139 GREENWICH STREET,

NEW YORK.

Manning & Lee,

GENERAL COMMISSION MERCHANTS,

NO. 51 EXCHANGE PLACE,

BALTIMORE.

Agents for Avalon Railroad Iron and Nail Works,
Maryland Mining Company's Cumberland Coal 'CED'
—'Potomac' and other good brands of Pig Iron.

Railroad Car Manufacturer's Furnishing Store.

F. S. & S. A. MARTINE,
IMPORTERS AND MANUFACTURERS OF
**RAIL ROAD CAR &
CARRIAGE LININGS,**
PLUSHES, CURTAIN MATERIALS, ETC.,
112 WILLIAM ST., NEAR JOHN.

3-4 and 6-4 Damasks, Union and Worsted; Mo-
reens, Rattinets, Cloths, Silk and Cotton Velvets,
English Bunting

S. W. Hill,

Mining Engineer and Surveyor, Eagle River,
Lake Superior.

Alfred W. Craven,

Chief Engineer Croton Aqueduct, New York.

Starks & Pruyn, MANUFACTURERS OF ALL KINDS OF STEAM BOILERS,

52 and 54 Liberty, corner of Pruyn street

Nathan Starks, **ALBANY** Special Partner
Wm. F. Pruyn, R. H. Pruyn.
Iron Railing, Bank and Vault Doors, Iron Shutters
Bridge and Roof Bolts, Heavy Jobbing and Forging
of all kinds.

For particulars see Adv. in another column.

To Engineers and Surveyors.

E. BROWN AND SON Mathematical inst. mak-
ers No. 27 Fulton Slip, New York, make and keep
for sale, Theodolites, Levelling inst., Levelling rods,
Surveyors Compasses, and Chains, Cases of Mathe-
matical drawing insts. various qualities, together with
a general assortment of Ivory Scales and small insts.
generally used by Engineers.

Samuel Kimber & Co., COMMISSION MERCHANTS

WILLOW ST. WHARVES, PHILADELPHIA.
AGENTS for the sale of Charcoal and Anthracite
Pig Iron, Hammered Railroad Car and Locomo-
tive Axles, Force Pumps of the most approved con-
struction for Railroad Water Stations and Hydraulic
Rams, etc., etc.
July, 27, 1849.

James Herron, Civil Engineer,

OF THE UNITED STATES NAVY YARD,
PENSACOLA, FLORIDA.,

HERRON RAILWAY TRACK.

Models of this Track, on the most improved plans,
may be seen at the Engineer's office of the New York
and Erie Railroad.

To Railroad Companies.

—WROUGHT IRON WHEELS—
SAFETY AND ECONOMY.

NORRIS' LOCOMOTIVE WORKS, SCHENECTADY, NEW YORK,

Are Manufacturing Wrought Iron Driving, Truck,
Tender, and Car Wheels—made from the best Ameri-
can Iron. Address E. S. NORRIS.
May 16, 1849.

Machinery Warehouse.

S. C. HILLS, No. 43 Fulton street, New York, has
constantly for sale Steam Engines, Boilers, Lathes,
Chucks, Drills, Planers, Force and Suction Pumps;
Tenoning, Morticing and Boring Machines, Shingle
Machines, Bolt and Nut Machines, Belting, Oil, Iron
and Lead Pipe; Rubber, Percha and Leather Hose,
&c., &c.

S. C. H.'s arrangements with several machine shops
are such that he can supply, at very short notice, large
quantities of machinery.

November 23, 1849.

Cruse & Burke,

Civil Engineers, Architects and Surveyors,
Office, New York State Institution of Civil Engineers,
STATE HALL, ALBANY., N. Y.

Drawings, specifications and surveys accurately ex-
ecuted. Pupils instructed theoretically and practical-
ly at a moderate premium.
May 26, 1849.

Eaton, Gilbert & Co.,

Railroad Car, Coach and Omnibus Builders,
TROY, N. Y.

Hudson River Foundry, THOMAS & COLLINS,

130 Quay Street, Albany.

To Railroad & Navigation Cos.

Mr. M. Butt Hewson, Civil Engineer, offers his
services to Companies about to carry out the surveys
or works of a line of Navigation or Railroad. He can
give satisfactory references in New York City as to his
professional qualifications; and will therefore merely
refer here to the fact of his having been engaged for
upwards of two years conducting important Public
Works for the British Government.
Communications will find Mr. Hewson at the office
of the Railroad Journal, 54 Wall Street, New York.

Walter R. Johnson,

CIVIL AND MINING ENGINEER AND AT-
torney for Patents. Office and Laboratory, F St.,
opposite the Patent office, Washington, D. C.

Cop Waste.

CLEAN COP WASTE, suitable for cleaning Rail-
road, Steamboat and Stationary Engines, con-
stantly on hand and for sale by

KENNEDY & GELSTON,
5½ Pine St., New York.

October 27, 1849,

3m

IRON.

Iron.

Pig Iron, Anthracite and Charcoal; Boiler and Flue
Iron, Spring and Blistered Steel, Nail Rods, Best Re-
fined Bar Iron, Railroad Iron, Car Axles, Nails, Stove
Castings, Cast Iron Pipes of all sizes, Railway Chairs
of approved patterns for sale by
COLEMAN, KELTON & CAMBELL,
109 N. Water St., Philadelphia.

IRONDALE PIG METAL, MANUFACTURED

and for sale by the Bloomsburg Railroad Iron Co.
DUDLEY FISHER, Treasurer.
75 N. Water St., Philadelphia.

Railroad Iron.

500 Tons, afloat, weighing 57 pounds per lineal
yard, for sale by

COLLINS, VOSE & CO.,
158 South St.
New York, November 17, 1849.

Railroad Iron.

THE Undersigned, Agents for Manufacturers, are
prepared to contract to deliver Rails of superior
quality, and of any size or pattern, to any ports of dis-
charge in the United States.

COLLINS, VOSE & CO.,
158 South St.
New York, November 17, 1849.

Railroad Iron.

1675 Tons, weighing about 61 lbs. per yard, 90
tons, weighing about 52 lbs. per yard, and
825 tons, weighing about 53½ lbs. per yard, of the lat-
est and most approved patterns of T rail, for sale by
BOORMAN, JOHNSTON & CO.,
119 Greenwich street.

New York, Feb. 25, 1850.

N.B.—B. J. & Co are also prepared to take con-
tracts for English rails, delivered in any of the Atlan-
tic ports of the United States.

Railroad Iron.

THE UNDERSIGNED, HAVING made arrange-
ments abroad, are prepared to contract for the deliv-
ery of Foreign rails, of approved brands upon the
most favorable terms.

They will also make contracts for American rails,
made at their Trenton works, from Andover Iron, in
whole or in part, as may be agreed upon.

They are prepared to furnish Telegraph, Spring and
Market Wire; Braziers and Wire Rods; Rivets and
Merchant Bars to order, all made exclusively from An-
dover Iron. The attention of parties who require Iron
of the very best quality for special purposes, is respect-
fully invited.

COOPER & HEWITT,
17 Burling Slip, New York.

February 15, 1850.

Glendon Refined Iron.

Round Iron, Band Iron, Hoop Iron,
Square " Flat " Scroll "

Axles, Locomotive Tyres,
Manufactured at the Glendon Mills, East Boston, for
sale by GEORGE GARDNER & CO.,
5 Liberty Square, Boston, Mass.

Sept. 15, 1849.

2m37

**PATENT HAMMERED RAILROAD, SHIP &
BOAT SPIKES.**—The Albany Iron Works
have always on hand, of their own manufacture, a
large assortment of Railroad, Ship and Boat Spikes
from 2 to 12 inches in length, and of any form of head.
From the excellence of the material always used in
their manufacture, and their very general use for rail-
roads and other purposes in this country, the manu-
facturers have no hesitation in warranting them fully
equal to the best spikes in market, both as to quality
and appearance. All orders addressed to the subscrib-
ers at the works will be promptly executed.

JOHN F. WINSLOW, Agent.

Albany Iron and Nail Works, Troy, N. Y.
The above Spikes may be had at factory prices, of
Erastus Corning & Co Albany; Menitt & Co., New
York; E. Pratt & Br. 1st, Ex. Trade Md

LAP—WELDED WROUGHT IRON TUBES

FOR

TUBULAR BOILERS,

FROM 1 1-2 TO 8 INCHES DIAMETER.

These are the ONLY Tubes of the same quality
and manufacture as those so extensively used in
England, Scotland, France and Germany, for Lo-
comotive, Marine and other Steam Engine Boilers

THOMAS PROSSER,

Patentee.

25 Platt street, New York

Railroad Iron.

THE UNDERSIGNED ARE PREPARED TO
contract for the delivery of English Railroad Iron
of favorite brands, during the Spring. They also re-
ceive orders for the importation of Pig, Bar, Sheet, etc.
Iron.

THOMAS B. SANDS & CO.,

22 South William street,

February 3, 1849.

New York.

Iron Store.

THE Subscribers, having the selling agency of the
following named Rolling Mills, viz: Norristown,
Rough and Ready, Kensington, Philadelphia, Potts-
grove and Thorndale, can supply Railroad Companies,
Merchants and others, at the wholesale mill prices for
bars of all sizes, sheets cut to order as large as 58 in.
diameter; Railroad Iron, domestic and foreign; Lo-
comotive tire welded to given size; Chairs and Spikes;
Iron for shafting, locomotive and general machine;
purposes; Cast, Shear, Blister and Spring Steel; Boil-
er rivets; Copper; Pig iron, etc., etc.

MORRIS, JONES & CO.,

Iron Merchants,

Schuykill 7th and Market Sts., Philadelphia.

August 16, 1849.

ly33

Railroad Iron.

THE MOUNT SAVAGE IRON WORKS, AL-
legany county, Maryland, having recently pass-
ed into the hands of new proprietors, are now prepar-
ed, with increased facilities, to execute orders for any
of the various patterns of Railroad Iron. Communi-
cations addressed to either of the subscribers will have
prompt attention. J. F. WINSLOW, President

Troy, N.Y.

ERASTUS CORNING, Albany

WARREN DELANO, Jr., N.Y.

JOHN M. FORBES, Boston.

ENOCH PRATT, Baltimore, Md.

November 6, 1849.

Railroad Iron.

THE SUBSCRIBERS ARE PREPARED TO
take orders for Railroad Iron to be made at their
Phoenix Iron Works, situated on the Schuykill Riv-
er, near this city, and at their Safe Harbor Iron Works,
situated in Lancaster County, on the Susquehanna
river; which two establishments are now turning out
upwards of 1800 tons of finished rails per month.

Companies desirous of contracting will be promptly
supplied with rails of any required pattern, and of the
very best quality.

REEVES, BUCK & CO.,

45 North Water St., Philadelphia.

March 15, 1849.

Monument Foundry.

A. & W. DENMEAD & SON,
Corner of North and Monument Sts.,—Baltimore,
HAVING THEIR

IRON FOUNDRY AND MACHINE SHOP

In complete operation, are prepared to execute faithfully and promptly, orders for Locomotive or Stationary Steam Engines, Wooden, Cotton, Flour, Rice, Sugar Grist, or Saw Mills, Slide, Hand or Chuck Lathes, Machinery for cutting all kinds of Gearing, Hydraulic, Tobacco and other Presses, Car and Locomotive patent Ring Wheels, warranted,

Bridge and Mill Castings of every description, Gas and Water Pipes of all sizes, warranted, Railroad Wheels with best faggoted axle, furnished and fitted up for use, complete

Being provided with Heavy Lathes for Boring and Turning Screws, Cylinders, etc., we can furnish them of any pitch, length or pattern.

Old Machinery Renewed or Repaired—and Estimates for Work in any part of the United States furnished at short notice.

June 8, 1849.

Iron Wire.

REFINED IRON WIRE OF ALL KINDS,
Card, Reed, Cotton-flyer, Annealed, Broom, Buckle, and Spring Wire. Also all kinds of Round, Flat or Oval Wire, best adapted to various machine purposes, annealed and tempered, straightened and cut any length, manufactured and sold by

ICHABOD WASHBURN.

Worcester, Mass., May 25, 1849.

American and Foreign Iron.**FOR SALE.**

300 Tons A. 1, Iron Dale Foundry Iron.

100 " 1, " " " "

100 " 2, " " " "

100 " " Forge " "

400 " Wilkesbarre " "

100 " "Roaring Run" Foundry Iron.

300 " Fort " "

50 " Catoctin " "

250 " Chikiswalungo " "

50 " "Columbia" "chilling" iron, a very superior article for car wheels.

75 " "Columbia" refined boiler blooms.

30 " 1 x 1/2 Slit iron.

50 " Best Penna. boiler iron.

50 " "Puddled" " "

50 " Bagnall & Sons refined bar iron.

50 " Common bar iron.

Locomotive and other boiler iron furnished to order.

GOODHUE & CO.,

New York.

64 South street

American Pig, Bloom and Boiler Iron.

HENRY THOMPSON & SON,
No 57 South Gay St., Baltimore, Md.,

Offer for sale. Hot Blast Charcoal Pig Iron made at the Catoctin (Maryland), and Taylor (Virginia), Furnaces; Cold Blast Charcoal Pig Iron from the Cloverdale and Catawba, Va., Furnaces, suitable for Wheels or Machinery requiring extra strength; also Boiler and Flue Iron from the mills of Edge & Hilles in Delaware, and best quality Boiler Blooms made from Cold Blast Pig Iron at the Shenandoah Works, Va. The productions of the above establishments can always be had at the lowest market price for approved paper.

American Pig Iron of other brands, and Rolled and Hammered Bar Iron furnished at lowest prices. Agents for Watson's Perth Amboy Fire Bricks, and Rich & Coa. New York Salamander Iron Chests.

Baltimore, June 14, 1849.

6 mos

LAP-WELDED WROUGHT IRON TUBES
for Tubular Boilers, from 1 1/2 to 15 inches diameter, and any length not exceeding 17 feet—manufactured by the Caledonian Tube Company, Glasgow, and for sale by

IRVING VAN WART,

12 Platt street, New York.

JOB CUTLER, Patentee.

These Tubes are extensively used by the British Government, and by the principal Engineers and Steam Marine and Railway Companies in the Kingdom.

Pig and Bloom Iron.

THE Subscribers are Agents for the sale of numerous brands of Charcoal and Anthracite Pig Iron, suitable for Machinery, Railroad Wheels, Chains, Hollowware, etc. Also several brands of the best Puddling Iron, Juniata Blooms suitable for Wire, Boiler Plate, Axe Iron, Shovels, etc. The attention of those engaged in the manufacture of Iron is solicited by

A. WRIGHT & NEPHEW,
Vine Street Wharf, Philadelphia.

Iron.

THE SUBSCRIBERS having resumed the agency of the New-Jersey Iron Company, are prepared to execute orders for the different kinds and sizes of Iron usually made at the works of the company, and offer for sale on advantageous terms.—

150 tons No. 1 Boonton Foundry Pig Iron.

100 " No. 2 do. do. do.

300 " Nos. 2 & 3 Forge do. do.

100 " No. 2 Glendon do. do.

140 " Nos. 2 & 3 Lehigh Crane do. do.

100 " No. 1 Pompton Charcoal do.

100 " New-Jersey Blooms

50 " New-Jersey Faggoting Iron, for shafts

Best Bars, 1/2 to 4 inch by 1/2 to 1 inch thick.

Do do Rounds and Squares, 1/2 to 3 inch.

Rounds and Squares, 3-16 to 1 inch.

Half Rounds, 1/2 to 1 in. Ovals & Half Ovals 1/2 to 1 1/2 in.

Bands, 1 1/2 to 4 inch. Hoops, 1/2 to 2 inch.

Trunk Hoops, 1/2 to 1 1/2 in. Horse Shoe & Nut Iron.

Nail Plates. Railroad Spikes.

DUDLEY B. FULLER & Co., 139 Greenwich-st. and 85 Broad-st.

WILLIAM JESSOP & SONS' CELEBRATED CAST-STEEL.

The subscribers have on hand, and are constantly receiving from their manufactory,

PARK WORKS, SHEFFIELD,

Double Refined Cast Steel—square, flat and octagon. Best warranted Cast Steel—square, flat and octagon. Best double and single Shear Steel—warranted. Machinery Steel—round.

Best and 2d gy. Sheet Steel—for saws and other purposes.

German Steel—flat and square, "W. I. & S." "Eagle" and "Goat" stamps.

Genuine "Sykes" L Blister Steel.

Best English Blister Steel, etc., etc., etc.

All of which are offered for sale on the most favorable terms by **WM. JESSOP & SONS,** 91 John street, New York.

Also by their Agents—

Curtis & Hand, 47 Commerce street, Philadelphia.

Alex'r Fullerton & Co., 119 Milk street, Boston.

Stickney & Beatty, South Charles street, Baltimore.

May 6, 1848.

SPRING STEEL FOR LOCOMOTIVES, TENDERS AND CARS.—The subscriber is engaged in manufacturing spring steel from 1 1/2 to 6 inches in width, and of any thickness required: large quantities are yearly furnished for railroad purposes, and wherever used its quality has been approved of. The establishment being large, can execute orders with great promptitude, at reasonable prices, and the quality warranted. Address **J. F. WINSLOW, Agent,** Albany Iron and Nail Works.

JOHNSON, CAMMELL & Co's Celebrated Cast Steel,

AND
ENGINEERING AND MACHINE FILES,
which for quality and adaptation to mechanical uses, have been proved superior to any in the United States. Every description of square, octagon, flat and round cast steel, sheet, shovel and railway spring steel, best double and single shear steel, German steel, flat and square, goat stamps, etc. Saw and file steel, and steel to order for any purposes, manufactured at their Cyclops Steel Works Sheffield.

JOHNSON, CAMMELL & CO.,

100 William St., New York.

November 23 1842.

COLUMBUS, OHIO, Railroad Car Manufactory. RIDGWAYS & KIMBALL,

HAVE established at this central point, the manufacture of Passenger, Freight, Gravel and Hand Cars for Railroads, and assure all Western Railroad Companies that it will be their constant aim to procure the best materials and workmen, and to turn out the best kind of work at fair prices. Specimens may be seen on the Columbus and Xenia Railroad. The patronage of Railroad Companies is respectfully solicited.

American Cast Steel.

THE ADIRONDAC STEEL MANUFACTURING CO. is now producing, from American iron, at their works at Jersey City, N.J., Cast Steel of extraordinary quality, and is prepared to supply orders for the same at prices below that of the imported article of like quality. Consumers will find it to their interest to give this a trial. Orders for all sizes of hammered cast steel, directed as above, will meet with prompt attention.

May 28, 1849.

To Steam Engine Builders.

THE Undersigned offer for sale, at less than half its cost, the following new machinery, calculated for an engine of 62 inches cylinder and 10 feet stroke, viz:

2 Wrought Iron Cranks, 60 inches from centre to centre.

1 Do. do. Connecting Rod Strap.

2 Do. do. Crank Pins.

1 Eccentric Strap.

1 Diagonal Link with Brasses.

1 Cast Iron Lever Beam (forked).

The above machinery was made at the West Point Foundry for the U. S. Steamer Missouri, without regard to expense, is all finished complete for putting together, and has never been used. Drawings of the cranks can be seen on application to

HENRY THOMPSON & SON,

No. 57 South Gay St., Baltimore, Md.

Sept. 12, 1849.

Railroad Instruments.

THEODOLITES, TRANSIT COMPASSES, and Levels, with Fraunhoffer's Munich Glasses, Surveyor's Compasses, Chains, Drawing Instruments, Barometers, etc., all of the best quality and workmanship, for sale at unusually low prices, by

E. & G. W. BLUNT,

No. 179 Water St., cor. Burling Slip.

New York, May 19, 1849.

Ballard's Improved JACK-SCREW.

PATENTED.

THE ADVANTAGES OF THIS Screw for Stone Quarries, Railroads, Steam Boiler Builders, and for other purposes are superior to any other similar machine.

The improvement consists in being able to use either end of the screw, as occasion requires.

It is capable of raising the heaviest Locomotive with ease, being portable, strong and powerful, and not likely to get out of order.

Many Railroad Companies and Boiler Makers have them in use—by whom they are highly recommended.

JACK SCREWS, of various sizes, power and price, constantly on hand at the manufactory.

No. 7 Eldridge Street, near Division Street.
New York, Jan. 19, 1850.

To Railroad Companies and Contractors.

FOR SALE.—Two Locomotive Engines and Tenders, at present in use on the Beaver Meadow Railroad, being too light for their coal trains, but well calculated for either gravel or light passenger trains.

They weigh, in running order, about 8 tons each—having one pair of driving wheels 4 feet diameter, 4 truck wheels 30 inches diameter, with cylinders 10 in. diameter, and 18 inches stroke of piston. Tenders on 4 wheels. Address **JAMES ROWLAND,**

Prest. Beaver Meadow Railroad & Coal Co., Philadelphia.

or, **L. CHAMBERLAIN, Sec'y,**

at Beaver Meadow, Pa.

May 19, 1849.

To Inventors and Patentees.

OWEN G. WARREN, ARCHITECT, Has had many years' experience as Agent for obtaining Patents, both in this country and Europe, and will transact such business promptly and reasonably. Persons at a distance can have their business done by correspondence—without the necessity of visiting this city or Washington. Office No. 94 Merchants Exchange, Wall st., corner of Hanover st., up stairs.

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To Railroad Companies.

FOR SALE—A Second-hand Locomotive Engine and Tender, of about 10 tons weight, in good order, and warranted to perform well. Any company wanting a cheap engine for a passenger or light burden train, will rarely meet with an opportunity so favorable as the present. The engine and tender are in perfect running order, and will be tested to the satisfaction of any one wishing to purchase. Price \$1,500.

Address **J. B. MOORHEAD,**
Frazer P.O., Chester county, Pa.

P.S.—The Engine can be seen by calling on H. Osmond & Co., Car-builders, Broad st., Philadelphia.
September 6, 1849.

India-rubber for Railroad Cos.

RUBBER SPRINGS—Bearing and Buffer—Fuller's Patent—Hose from 1 to 12 inches diameter. Suction Hose. Steam Packing—from 1-16 to 2 in. thick. Rubber and Gutta Percha Bands. These articles are all warranted to give satisfaction, made under Tyler & Helm's patent, issued January, 1849.—No lead used in the composition. Will stand much higher heat than that called "Goodyear's," and is in all respects better than any in use. Proprietors of railroads do not be overcharged by pretenders.

HORACE H. DAY,
Warehouse 23 Courtlandt street.
New York, May 21, 1849.

Fire Brick.

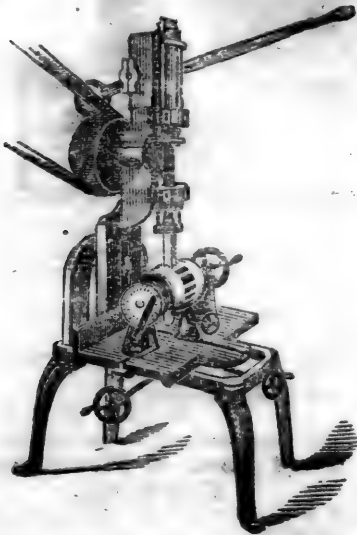
THE Subscribers have constantly on hand Rafford's Stourbridge, Oak Farms Stourbridge, Lister, Wortley, Red and White Welsh Fire Bricks, common and fancy shapes. Also,

ROOFING SLATES,
from the best Welch quarries, and of all sizes. Also,
COAL,

of all kinds—Liverpool Orrell and Cannel, Scotch, New Castle, Picton, Sidney, Cumberland, Virginia, and all kinds of Anthracite coals. Also,

Pig Iron, Salt, etc., etc., for sale at the lowest market price. Apply to

SAMUEL THOMPSON & NEPHEW,
275 Pearl and 43 Gold Sts., New York.
November, 23, 1849.

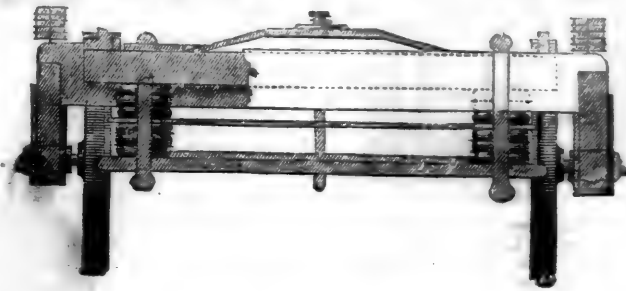
**Capt. Alfred Swingle's
PATENT BORING
& MORTISING MACHINE.**

The above Machine was invented by A. SWINGLE, of Texas, in 1846, and Letters Patent were taken out in July, 1848. As a labor saving Machine it stands unrivalled even in these days of improvements. Its uses are innumerable; it may be successfully applied to Doors, Sashes, Carriages, Wheel-Hubs, and in fact to all kinds of work where the Auger and Chisel can be brought to bear.

The only limit to the speed of the working of this machine is the heating of the tools used. It will perform at least the labor of twelve men, and in vastly better manner, and can be worked equally well by steam power or by hand. It has been used and has given universal satisfaction.

For further information apply to H. B. THOMAS, 40 Wall St., New York, to whom all orders are to be addressed.

New York, December 15, 1849.

**FULLER'S PATENT
INDIA RUBBER CAR SPRINGS.**

RAILROAD COMPANIES are cautioned, before purchasing Springs, to examine the actual patents and judge for themselves.

Persons, under the Title of the New England Car Company, seeking fraudulently to invade Fuller's rights, have put forth so many statements for the purpose of misleading the public, that an enumeration of some of the facts is absolutely necessary, for the purpose of putting persons interested upon their guard.

Fuller's patent is for the application of Discs of India-rubber with Metal Plates, for forming Springs for Railway Cars and Carriages—either one disc and two plates, or ten discs and plates, or any other number, are equally covered by the patent. Fuller is not bound to the use of short discs—he may use long discs and plates.

Ray's patent is simply and wholly the forming of air tight rubber cylinders, with hoops or bands round the outside, and the combination of elasticity of India rubber, with the elasticity of atmospheric air confined in the cylinder, and in no part of his patent is he authorized to use the form of spring which is now fraudulently supplying to Railroad Companies. Such springs are direct and positive infringements of the very letter of Fuller's patent.

Fuller's patent is dated October, 1845, Ray's patent, August, 1848.

The spring patented by Ray never has been put in operation, and never can be made useful for Railroad cars.

A mere experiment, even if made, it is well known does not prove an invention; and it is ridiculous for such parties to hope to mislead the Presidents and Superintendents of Railroad companies, by claiming the invention because Ray alleges he made an experiment—which Fuller had made before him—had actually brought into working order, and obtained a patent for—and this too before Mr. Ray states he made his experiment—and that experiment not claimed to have been applied to a car or carriage.

Besides, the invention could not have been developed until India rubber, properly Vulcanised, could be made of a sufficient thickness. In the United States the art of vulcanising rubber by steam heat, (by which

means only can a body of rubber having any considerable thickness be vulcanised,) was not introduced until after the grant by the American government of the patent for springs to Fuller—whereas the process of vulcanising rubber by steam heat was invented in England about three years previously, and was used by Fuller there. This fact refutes entirely the claim of invention put forth by Mr. Ray, and proves the impossibility of his pretensions being true.

Fuller was the first and only inventor of the spring. A Mr. Dorr, whose connection with Mr. Goodyear is well known in this country, applied in England to Mr. Fuller, after he had published and patented his invention, and introduced another party for the purpose of obtaining the agency for the United States. They were furnished with a complete set of drawings and models, and with instructions to make arrangements for the supply of material of American manufacture—from that hour to the present not a single communication has been received from them. Some of these identical models have been traced into the hands of parties now seeking to invade Fuller's rights, and who have exhibited them as specimens of their own invention.

After this, the conveyance was made by Goodyear to certain parties here for the use for railroad springs of what he calls his Metallic rubber. Comment is unnecessary.

There are 5 or 6 different processes for the manufacture of vulcanised rubber, patented by as many different parties, some here, some in England, either of which would probably make good springs.

A large and powerful company has been organized under Fuller's patent, the particulars of which shall be given very shortly.

An action has been commenced against three railroad companies for infringement; and all other parties will assuredly be prosecuted if they continue farther to infringe upon Fuller's patent.

W. C. FULLER,

The only persons authorized to supply the Springs are **G. M. KNEVITT**, 38 Broadway, N. York,
General Agent for the U. S.; and
JAS. LEE & Co., 13 India Wharf, Boston.
JOHN THORNLEY, Chestnut st., Philad.

**Arch St. Machine Shop.
BIRKENBINE, MARTIN & TROTTER,**

Makers of
STEAM ENGINES,
and
HYDRAULIC MACHINERY,
NO. 16 ARCH STREET,
PHILADELPHIA.

Will construct Steam Engines, Pumps, for Draining Mines and Land; supplying Water to Towns, Factories, Farms, etc;

Also, Street Stops, Fire Plugs, Water Tanks, and Hydraulic Rams, with—

(BIRKENBINE'S PATENT VALVES.)

B., M. & T. contract for Warming and Ventilating Buildings by Steam or Warm Water.

J. E. Mitchell,

NO. 14 OLD YORK ROAD, PHILADELPHIA.
Importer and manufacturer of

New Castle }
Nova Scotia } Grindstones, of all sizes and grits.
Wickery }
French Burr }
Cocoaheo } Millstones, made to order, with all
Cologne } the recent improvements.
American and }
Patent compressed } Fire Bricks and Tiles of various
Garnier } sizes.

Burr Blocks, Bolting Cloths, Mill Irons, etc.

**To the Proprietors of Rolling
Mills and Iron Works.**

THE Undersigned—Proprietors of Townsend's Furnace and Machine Shop, Albany—are extensively engaged in the manufacture of Machinery and fixtures for Iron, and Copper Rolling Mills, and Iron Works. Having paid particular attention to the manufacture of *Rolls* (Rollers), both *chilled* and *dry-cand*, they feel confident that they can execute orders for such castings in a satisfactory manner. And to give assurance of this, they beg leave to refer to the following named persons, proprietors and managers of some of the most extensive rolling mills in the country, viz: Jno. F. Winslow, J. Tuckerman, H. Burden, W. Burt, J. & J. Rogers, Saltus & Co., J. B. Bailey, L. G. B. Cannon, Hawkins & Atwater, etc., etc.

F. & T. TOWNSEND.

Albany, August 18, 1849.

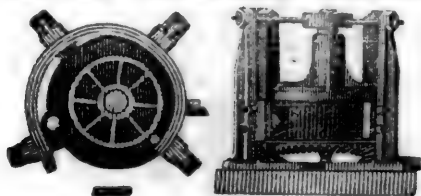
Steam Boiler Explosions.

THE Subscriber having been appointed sole Agent for Faber's Magnetic Water Gauge, is now ready to supply the trade, and also individuals with this celebrated instrument. Besides the greatest safety from explosion resulting from its use, it is a thorough check against careless stoking and feeding. In marine engines it will regulate the exact quantity required in the "blow off." Pamphlets containing full information, can be had free on application to the Agent

JOSEPH P. PIRSSON,
Civil Engineer, 5 Wall st.

MACHINERY.

Henry Burden's Patent Revolving Shingling Machine.



THE Subscriber having recently purchased the right of this machine for the United States, now offers to make transfers of the right to run said machine, or sell to those who may be desirous to purchase the right for one or more of the States.

This machine is now in successful operation in ten or twelve iron works in and about the vicinity of Pittsburgh, also at Phoenixville and Reading, Pa., Covington Iron Works, Md., Troy Rolling Mills, and Troy Iron and Nail Factory, Troy, N. Y., where it has given universal satisfaction.

Its advantages over the ordinary Forge Hammer are numerous: considerable saving in first cost; saving in power; the entire saving of shingler's, or hammerman's wages, as no attendance whatever is necessary, it being entirely self-acting; saving in time from the quantity of work done, as one machine is capable of working the iron from sixty puddling furnaces; saving of waste, as nothing but the scoria is thrown off, and that most effectually; saving of staffs, as none are used or required. The time required to furnish a bloom being only about six seconds, the scoria has no time to set, consequently is got rid of much easier than when allowed to congeal as under the hammer. The iron being discharged from the machine so hot, rolls better and is much easier on the rollers and machinery. The bars roll rounder, and are much better finished. The subscriber feels confident that persons who will examine for themselves the machinery in operation, will find it possesses more advantages than have been enumerated. For further particulars address the subscriber at Troy, N. Y.

P. A. BURDEN.

Railroad Spikes and Wrought Iron Fastenings.

THE TROY IRON AND NAIL FACTORY, exclusive owner of all Henry Burden's Patented Machinery for making Spikes, have facilities for manufacturing large quantities upon short notice, and of a quality unsurpassed.

Wrought Iron Chairs, Clamps, Keys and Bolts for railroad fastenings, also made to order. A full assortment of Ship and Boat Spikes always on hand.

All orders addressed to the Agent at the Factory will receive immediate attention.

P. A. BURDEN, Agent,
Troy Iron and Nail Factory, Troy, N. Y.

RAILROAD WHEELS.

CHILLED RAILROAD WHEELS.—THE UNDERSIGNED are now prepared to manufacture their Improved Corrugated Car Wheels, or Wheels with any form of spokes or discs, by a new process which prevents all strain on the metal, such as is produced in all other chilled wheels, by the manner of casting and cooling. By this new method of manufacture, the hubs of all kinds of wheels may be made whole—that is, without dividing them into sections—thus rendering the expense of banding unnecessary; and the wheels subjected to this process will be much stronger than those of the same size and weight, when made in the ordinary way.

A. WHITNEY & SON,
Willow St., below 13th,
Philadelphia, Pa.

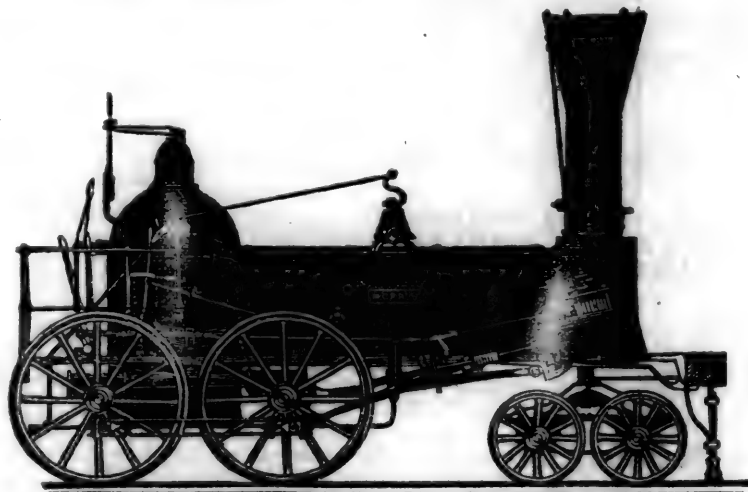
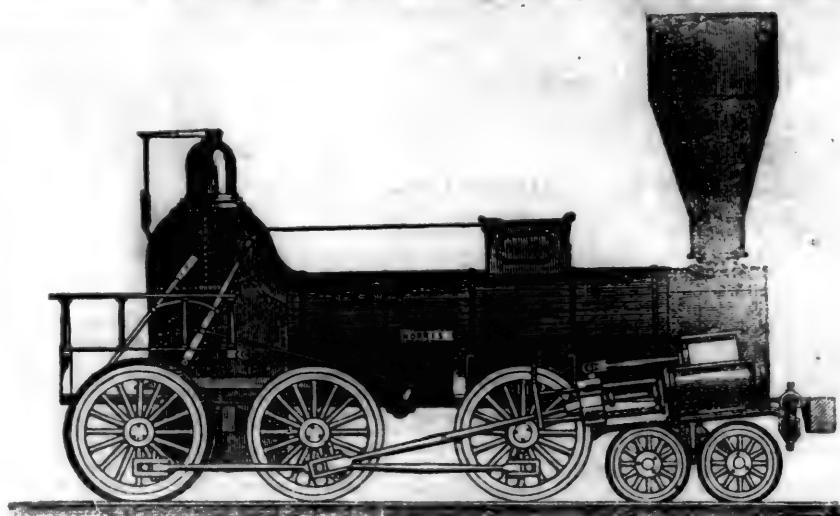
CHILLED RAILROAD WHEELS.—THE UNDERSIGNED, the Original Inventor of the Plate Wheel with solid hub, is prepared to execute all orders for the same, promptly and faithfully, and solicits a share of the patronage for those kind of wheels which are now so much preferred, and which he originally produced after a large expenditure of time and money.

A. TIERS,
Point Pleasant Foundry.

He also offers to furnish Rolling Mill Castings, and other Mill Gearing, with promptness, having, he believes, the largest stock of such patterns to be found in the country.

A. T.

Kensington, Philadelphia Co.,
March 12, 1848.

NORRIS' LOCOMOTIVE WORKS.
BUSHHILL, SCHUYLKILL SIXTH-ST., PHILADELPHIA,

THE UNDERSIGNED Manufacture to order Locomotive Steam Engines of any plan or size. Their shops being enlarged, and their arrangements considerably extended to facilitate the speedy execution of work in this branch, they can offer to Railway Companies unusual advantages for prompt delivery of Machinery of superior workmanship and finish.

Connected with the Locomotive business, they are also prepared to furnish, at short notice, Chilled Wheels for Cars of superior quality.

Wrought Iron Tyres made of any required size—the exact diameter of the Wheel Centre, being given, the Tyres are made to fit on same without the necessity of turning out inside.

Iron and Brass castings, Axles, etc., fitted up complete with Trucks or otherwise.

NORRIS, BROTHERS

LAWRENCE'S ROSENDALE HYDRAULIC Cement. This Cement is warranted equal to any manufactured in this country, and has been pronounced superior to Francis' "Roman." Its value for Aqueducts, Locks, Bridges, Floods, and all Masonry exposed to dampness, is well known, as it sets immediately under water, and increases in solidity for years. For sale in lots to suit purchasers, in tight papered barrels, by

JOHN W. LAWRENCE,
142 Front-street, New York.

Orders for the above will be received and promptly attended to at this office. 32 ly.

PATENT MACHINE MADE HORSE-SHOES.

The Troy Iron and Nail Factory have always on hand a general assortment of Horse Shoes, made from Refined American Iron.

Four sizes being made, it will be well for those ordering to remember that the size of the shoe increases as the numbers—No. 1 being the smallest.

P. A. BURDEN, Agent,
Troy Iron and Nail Factory, Troy, N. Y.

Text Book of Mechanical Drawing,

FOR the use of SCHOOLS and SELF-INSTRUCTION, containing,

1st. A series of progressive practical problems in Geometry, with full explanations, couched in plain and simple terms; showing also the construction of the parallel ruler, plane scales and protractor.

2d. Examples for drawing plans, sections and elevations of Buildings and Machinery, the mode of drawing elevations from circular and polygonal plans, and the drawing of Roman and Grecian Mouldings.

3d. An introduction to Isometrical drawing, with 4 plates of examples.

4th. A treatise on Linear Perspective, with numerous examples and full explanations, rendering the study of the art easy and agreeable.

5th. Examples for the projection of shadows. The whole illustrated with 50 STEEL PLATES.

Published by WM. MINIFIE & CO.,
114 Baltimore St., Baltimore Md.
Price \$3, to be had of all the principal booksellers.

AMERICAN RAILROAD JOURNAL.

STEAM NAVIGATION, COMMERCE, MINING, MANUFACTURES.

HENRY V. POOR, Editor.

ESTABLISHED 1831.

PUBLISHED WEEKLY, AT No. 136 NASSAU ST., NEW YORK, AT FIVE DOLLARS PER ANNUM IN ADVANCE.

SECOND QUARTO SERIES, VOL. VI., No. 10.]

SATURDAY, MARCH 9, 1850.

[WHOLE No. 725, VOL. XXIII.]

ASSISTANT EDITORS,

J. T. HODGE, *For Mining and Metallurgy.*
GEN. CHAS. T. JAMES, *For Manufactures and the
Mechanic Arts.*
M. BUTT HEWSON, C. E., *For Civil Engineering.*

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American Railroad Journal.

PUBLISHED BY J. H. SCHULTZ & CO., 136 NASSAU ST.

Saturday, March 9, 1850.

The Coal Trade of London.

The companion to the British Almanac for 1850, gives an account of the commercial arrangements connected with the supply of coal to the metropolis; a supply which involves an expenditure of capital, and an amount of employment, such as few would suppose who have not investigated the subject. Although the colliery statistics of Northumberland and Durham belong to the country at large rather than to London alone, yet the enormous consumption in London renders it desirable to begin at the first great stage of the subject, and to follow the commercial history of a ton of coal from the pit's mouth to the cellar of the consumer.

It will assist us in this object, if we first give a rapid glance at the legislative enactments now in force respecting the London coal trade.

In 1831 an Act was passed (1 & 2 Will. 4, c. 76), which has been the basis of much of the subsequent legislation. It swept away most of the provisions of six former Acts of Parliament, which had long lost their working efficiency; and laid down others in their stead. By the clauses of this Act the land and buildings of the Coal Exchange, which had in 1807 been vested in the Corporation

of London, were continued under the same trust. The Coal Exchange was to be made a free open market, to be called the "Coal Market." The Corporation was empowered to appoint and pay clerks and other officers of the Coal Market; to enlarge or to remove the market whenever deemed expedient; to purchase sites and tenements for any new building; to appropriate or dispose of the ground abandoned by such change; and to levy a duty of one penny on every ton of coals brought into the Thames westward of Gravesend, the said duty to remain in force until all the expenses attending the Coal Market were defrayed. All expenses connected with the erection or alteration of the Coal Exchange, and with the management of the market, were to be provided by loans, raised on the security of the penny duty. The Corporation was empowered to make bye-laws for the management of the market; and to appoint committees of disinterested persons to conduct the management. Then follow numerous regulations, declaratory that coals should be sold by weight instead of measure in the port of London; that a penalty should attach to the selling of coal as of other than its real quality; that lightermen may carry on partnership with coal dealers, for the transfer of their own coals on the Thames, under certain restrictions; that the seller of any quantity above 5 cwt. coals, to any person living within 25 miles of the General Post Office, shall send to the purchaser a ticket, calculated to act as guarantee for the quantity and quality of the coals delivered; that the means shall be provided for weighing the coals if required, and of enforcing penalties for evasion; and that quantities less than 5 cwt. shall be delivered without a ticket, but shall be weighed before delivery. By charters granted in 3 James I. and 12 James I., the Corporation possesses certain rights in respect to metage and lighterage of goods brought into the port of London: and by acts of Parliament passed in 1868, 1703, and 1830, certain dues were imposed upon all coals brought into the port of London—first, to pay for the rebuilding of London after the great fire; next for the aid of "orphans and other creditors of the City of London;" and next for making the approaches to new London Bridge. The act of 1831, after reciting these powers, enacts that the corporation shall be empowered to commute these rights for a duty of one shilling per ton; viz., four pence in respect to the chartered privileges, and eight pence in

respect to the London Bridge Approaches Fund.—The duty payable on coals brought inland by the Grand Junction Canal was assimilated to the duty on coals brought coastwise. The corporation dues were made payable before the removal of any coals from the vessels to the wharfs. The coal fitter or vender must send to the clerk of the coal market, with every cargo of coals, a certificate, stating the date of shipment, the name and owner of the ship, the quantity of coals, the collieries whence brought and the price paid for the coals; and the certificate so sent is to be registered at the coal market on the arrival of the ship.

In 1838 an act was passed (1 and 2 Vict. c. 101) which may be considered as subsidiary to the statute just noticed. By the act of 1831, most of the provisions were made for a period of seven years, to expire at the end of 1838; and by the act of 1838 these were, with a few exceptions, continued for a further period of seven years. Among the exceptions were the following:—The coal ticket is changed in form; a ticket is to be sent with coals in a lighter as well as in a wagon or cart; every coal-weighing machine is to be tested and marked at Guildhall; a drawback of all the city dues is made, under certain regulations, on coals which are exported from the port of London without having been landed. To protect the laborers often employed in unloading coal ships, it was enacted that all such persons should be paid their wages daily; and to prevent crowding and accident in the river, the corporation was empowered to make stringent regulations concerning the arrival, mooring and departure of the coal ships.

The coal laborers or coal whippers attracted sufficient attention to their condition and alleged hardships to obtain an act of Parliament in their favor in 1843 (6 and 7 Vict. c. 101). The following are the chief arrangements made by this statute:—A board of commissioners is to be appointed for registering and regulating the coal whippers. The board of trade is to appoint four of these commissioners, the corporation of London four more, and a ninth is to consist of the chairman for the time being of the General Ship Owners' Society of London. The commissioners are to open books of registry, under the care of a registrar in which are to be entered the name, the age, and other particulars, of every coal whipper employed in the port of London; a small fee being paid at registry. A certificate given to the coal whipper at the time

of registry, is to be his passport and security in pursuance of his calling. No person is to act as a coal whipper unless registered, except the crews of colliers, and the servants or laborers of the owner or purchaser of the cargo. Offices and stations are to be provided by the corporation at the request of the commissioners. The commissioners are to provide all the requisite stages, planks, gins, baskets, shovels and tackle, for whipping or discharging coals from the vessels; the coal owner may use apparatus of his own; but if he borrow such, it can only be from the commissioners, and the hire is paid for at so much per cargo. The master of every laden coal ship is to send notice to the coal whippers' office, as to the place, the quantity, and the time of the coals to be discharged. The officers of the coal whippers' office, upon the receipt of this notice, are to hold a kind of auction among the gangs of coal whippers there assembled; and the gang which will take the work at the lowest price is selected, subject to the approval of the master of the vessel. If either the clerk of the office or the master of the ship neglects to carry out the arrangements, they are fined, as a security to the coal whippers. Upon the conclusion of this discharge, the master is to pay the wages to a person appointed by the commissioners; and this money is handed over to the coal whippers, with a deduction not exceeding a farthing in a shilling. For carrying out the purposes of the act, the expression "Port of London," is limited to the distance between London Bridge and Gravesend. A "gang" of coal whippers, who work together as partners, consists of nine men: and the trade of coal whipping is defined to mean "the discharging of coal from a vessel by raising the coal from the hold in a basket or box by manual labor only, with the aid of ropes and a pulley; and shall include not only the persons who so raise the coal, but also those who fill and empty the box so raised."

Another act was passed in 1845 (8 and 9 Vict. c. 101), the chief object of which was to extend the operation of the former acts to a further period of seventeen years; so that most of the powers given to the corporation in 1831, and extended seven years further in 1838, and now extended from 1845 to 1862. One change effected has been a consequence of the opening of railways; it provides that all coals brought within twenty miles of London by any conveyance, shall pay the corporation dues.—Out of these dues, however, one penny per ton is to be transferred by the corporation to the commissioners of woods and forests, and by them applied as a fund for opening new streets and making similar improvements in the metropolis. Provision is made for compensation to land metes and other officers whose duties have been superseded since the old mode of managing the coal trade.

The coal whippers' statute, as we may term it, was only passed for three years; it expired in '46; and another act was passed in that year (9 and 10 Vict., c. 36), extending the main provisions of the statute to 1851. A few alterations were made, but they were slight in character; their chief tendency is to lessen in a slight degree the stringency of the rules which prevent a master of a coal ship from unloading where and how he pleases. All the by-laws made by the commissioners of coal whippers require the sanction of the board of trade.

Such being the chief enactments in force, we may now proceed to elucidate them by a few details.

The area of all the coal fields of Great Britain has been roughly estimated at 9,000 square miles.

The produce is supposed to be about 33,000,000 tons annually, of which 10,000,000 are consumed in the iron works, 8,500,000 tons shipped coastwise, 2,500,000 tons exported to foreign countries, and 11,000,000 distributed inland for miscellaneous purposes. The exact declared values of the quantities exported in three recent years were—

1846.....	£971,174
1847.....	968,502
1848.....	1,096,356

The port of Newcastle ships nearly one-half of all the coals exported. France takes about two-thirds of all the coals exported from Great Britain. Of the eight-and-a-half million tons shipped annually from one port to another, about two-and-a-half millions are shipped from Newcastle alone. The number of collieries belonging to Newcastle and the Tyne is about 130; the fixed capital invested in them is supposed to amount to not much less than ten millions sterling; and the vend or sale is from six to seven million tons annually. The increase in the home vend, at the Tyne, between the years 1800 and 1845, was 212 per cent.; in the foreign vend, 1254 per cent.; and in the aggregate, or total vend, 270 per cent.

The coals sent to London in four consecutive years amounted to the following large quantities:

	Tons.
1843.....	2,663,114
1844.....	2,563,166
1845.....	3,463,630
1846.....	2,975,627

Of these quantities about eleven-twelfths are supplied by the three rivers, Tyne, Wear, and Tees. The Tyne alone supplies about two-fifths of the whole. The quantity brought to London by railway and canal is a very small fraction of the whole. The quantity brought by ship alone in 1848 was 3,418,340 tons, besides a small quantity by inland conveyance. The proportion of the entire product of the Northumberland and Durham collieries which is brought to London, is probably about one-third—and as there are about 35,000 persons employed in connection with these collieries, we may perhaps be justified in saying, that 12,000 persons are employed in the north in digging and shipping coals for London. Of all the coals brought to London, it is computed that about one-eighth part is required by the gas companies.

The Northumberland and Durham coal owners have certain arrangements among themselves, concerning the quantity and price of the coals forwarded to London; and the legislature has had much difficulty in breaking down or lessening the monopoly thus occasioned. After the coals have left the pit, they have to traverse rail or tramways—from a few yards to a dozen miles in length—to the banks of the Tyne (supposing this to be the river at which the coals are shipped.) Here they have to do with *fitters* and *keelmen*. Fitters, who used to be designated *hostmen*, are coal brokers or factors residing at Newcastle; they manage all the transactions between the coal owners on one hand, and ship owners or other purchasers on the other. The keelmen are laborers who bring the coals down the Tyne in short strong barges, and hoist them into the holds of the coal ships which are moored near Shields; but by means of *stairths* or stages erected at the banks of the river, in connexion with the colliery railways, coals are now more frequently precipitated at once into the vessels, without the aid of keelmen; and the ship, so laden, proceeds on her voyage to London.

Numerous indeed are the items which raise step by step the price of coals to a London consumer.

In the year 1830, the port charges at Newcastle alone, for coals shipped to London, comprised no fewer than nine items—the Richmond Shilling, Scarborough Pier dues, Bridlington Pier dues, Whitby Pier dues, Trinity Lights, Low Harbour Lights, Private Lights, Tynemouth Light, and town dues. These were reduced in after years, principally by means of the abolition of the "Richmond Shilling." Then, arrived in the Thames, commenced the London dues. These at different periods have assumed the forms of orphan dues, metage dues, London Bridge dues, coal market dues, Coal Meters' Compensation dues, water bailage dues, groundage dues, permit fees, and registry fees. Many of these have been commuted from time to time in the modes pointed out in the abstracts of the statutes given in a former page. But the numerous Newcastle dues were smaller in am't than those of London, and bear a still less ratio at the present time. The "Richmond Shilling" was originally a grant made by the Hostmen's Company of Newcastle to Queen Elizabeth (in return for the privileges conceded by her), of one shilling per chaldron on all coals shipped from the Tyne. Charles the Second made over this grant to his children by Louisa Querouaille (afterwards Duchess of Portsmouth); whence has sprung the ducal house of Richmond. By the early part of the present century, this duty realized a very large amount; insomuch that the government commuted it for a perpetual annuity of £19,000 per year, payable to the Richmond family; in the purchase of which annuity the government expended more than half a million sterling! Although it is impossible to give a correct average, where the larger items are continually changing, we shall perhaps approach the truth in saying, that in the price paid for a cargo of good coals at the Coal Exchange of London (say at the present market price of about 18s. per ton), about 8s. is the value when the coals have reached the hold of the ship in the Tyne; 8s. for the transit from the Tyne to the Thames; and 2s. for various Thames dues.

But to proceed with our account. The ships employed to bring coals to London amount to a large number. Three hundred years ago, the use of coal had only just commenced in the metropolis; wood having previously been used. Two or three ships were enough at first to furnish the supply. By the year 1615, the number had increased to 200; by 1700 to 600. In 1805 there were 4,856 cargoes; in 1820, 5,884; in 1830, 7,108; and in 1840, 9,132. In 1845 there were 2,695 ships, which brought 11,987 cargoes, containing 3,403,320 tons; and in 1848 there were 2,717 ships, which brought 12,267 cargoes, amounting to 3,488,310 tons. Taking the number of ships actually and regularly employed in bringing coals to London at 2,700, with eight men to a ship, which is about the average, this gives about 22,000 persons so employed. The freight from the Tyne to London, including the Tyne duties, varies from about 7s. to 11s. per ton, according to the state of the weather and the amount of competition. The average cargo of a coal ship is somewhat under 300 tons.

Arrived in the Thames, the laden coal ship passes through numerous official ordeals. There is first the registering in the city books, and the payment of the city dues and fees; there is the routine of arrangement whereby the coal factor or broker, whose place of business is at the Coal Exchange, effects a sale of the cargo to the coal merchants; and there are the singular regulations concerning the discharging or whipping of the coals from the

ship into the barges of the merchant who has bought the cargo. The corporation arrangements are sufficiently illustrated by an abstract of the several acts of Parliament—the Coal Exchange arrangements deserve a little further elucidation.

The coal factors of London, acting in conjunction with the coal owners of the north, agree among themselves as to the number of cargoes which they will offer for sale on any one market day. This is to depend partly on the number of ships which enter the Thames between one market day and another, and partly on the market price of coals. They press the coals for sale only in certain quantities, in order to prevent the price from descending below a certain point. On the other hand, the corporation, to prevent these regulations from becoming too close a monopoly, acts on a specified set of bye-laws, so that the ultimate price to the consumer is the result of a balance between many conflicting agencies. Sometimes there have been 400 cargoes of coal in the Thames at one time, waiting for their turn to be sold according to the arrangements among the factors. There is a coal factor's office at Gravesend, and a coal trade office at Newcastle; and there is such a constant correspondence between these two offices and the coal factors of London, that the exact state of the market at both ends of the route is known at all times to those concerned.

In a Parliamentary report of 1836, the following account of the dealings at the old coal exchange was given: "There are three market days, Mondays, Wednesdays and Fridays, continued as before, though not required by statute, and the hours to sell and buy are from 12 to 2½ o'clock, as by the former act of Parliament. Every factor has a list setting forth the sorts of coal he has for sale on the Coal Exchange every market day; and when a cargo is sold, an agreement is entered into with the buyer, the price and conditions of payment being stated in detail, and the buyer agrees to pay 1½ pence a ton for half metage. All sales are private sales. The merchants may buy at all hours; but the factor will not enter his purchase on that day if it should be made after 2½ o'clock; after that hour, say on Monday, any person may buy for the next market day to deliver on Wednesday; but no factor will sell to deliver on Tuesday, as that would be against the regulations; and the factors will not take the consignment of coals, unless the owner complies with their rules and regulations; that is, to have their cargoes sold in rotation. Factors are paid by a commission of one-half per cent. on the amount of sale, and 3d. per ton for factorage; and they take the risk of the merchants for payment." These regulations have been continued with but little change ever since; it is possible that a few modifications and improvements may be introduced in the arrangement of the new building. The old Coal Exchange belonged to private individuals till 1807, when the corporation purchased it, to make it an open coal market. It was in 1845 that the leading firms in the coal trade petitioned the corporation to build a new Coal Exchange. The corporation assented; Mr. Bunning, the city clerk of the works, was commissioned to make plans and drawings; and the remarkable building just finished is the result.

To be continued.

Virginia and Tennessee Railroad.

We have received the second annual report of the directors of this important work. Since the last report the line from Lynchburg to Salem, a distance of 61 miles, has been placed under con-

tract, and immediate measures are about to be taken to complete a working survey of the whole line from Salem to the Tennessee State line.

A sufficient amount has been subscribed by individuals to entitle the company to the State subscription, and there now appears to be no obstacle to the vigorous prosecution of the work.

Our readers will be happy to hear such favorable accounts of the progress of this great enterprise. We hardly know of another road in the country to which so much interest attaches. It is to open to us the most interesting and attractive portion of the Union, which has hitherto been almost secluded from public attention; a section, the richest in its resources, but which still remains undeveloped for the want of suitable means of intercommunication. This road is to supply the only condition wanting to the most rapid development of this section of Virginia. On the completion of the connecting links it is to form a part of the great railroad line between the north and south.

We have copied largely from the report of the President, Gen. Q. G. Clay, and the Chief Engineer, C. F. M. Garnett, Esq., for the purpose of showing the influence that this road, though just commenced, is already exciting upon the public mind of that State in reference to turning a portion of its labor now entirely engaged in agricultural into other pursuits. The whole matter is so well stated in the report, that we prefer to transfer a portion of it into our paper for the purpose of giving to our readers a specimen of the manner in which they are beginning to reason in Virginia.

The following is from the report of the President:—

Being aware that the company will soon have to make a heavy expenditure of money, for the article of iron, necessary to the completion of their improvement, and looking to all the elements that enter the price and value of iron, when delivered in Lynchburg, the board are of the opinion that it might be sound policy, and true economy, for the company to manufacture the rails for the road by their own means, should it appear that it might be done on better terms than it could be procured otherwise.

There are many strong reasons for this course. The superior value of American iron and the moderate cost, are sufficient reasons; even if the cost would be somewhat greater, there would still be cogent reasons in favor of the undertaking. This is eminently a Virginia work, and to promote the prosperity and develop the resources of the State, Virginia will subscribe more than half the capital stock. The very object which induced the Legislature to subscribe to the stock, is more effectually obtained by making use of the coal and iron of Virginia, and the industry of her citizens to make the rails for the road. The furnaces of Rockbridge, Botetourt and Alleghany, can now supply the pig metal at less than the prices estimated. By this plan, more than one million of dollars will be expended among our own people, instead of being sent abroad to swell the prosperity of strangers and foreigners.

The following estimates carefully prepared, will settle the question of costs:

Cost of Manufacturing Railroad Iron at Lynchburg.

1½ ton of pig iron to the ton of rails at \$23 50 per ton	\$38 13
60 bushels of coal, at 13 cents	7 80
Workmen's wages	9 50
Working manager's wages	25
Clerk's wages and office charges	13
Forge repairs	1 00
Interest on capital invested in erecting rolling mills	50
Total cost of manufacture	\$47 31

This estimate is predicated upon the supposition that 5000 tons of rails are produced annually, and

the price of pig iron here, as assumed, is in accordance with its present value.

Cost of English Railroad Iron delivered at Lynchburg.

Cost at Richmond	\$41 50
As the English iron must be paid for in cash on delivery, it is proper to charge three months' interest on first cost	68
Cartage from vessel to canal boat	70
Freight to Lynchburg	1 00
Canal tolls per ton of 2,240 lbs.	4 08

Total cost at Lynchburg	\$47 91
To this should be added for difference in quality of American and English iron	8 00
	\$55 91

Making a difference in favor of American

iron of..... \$8 60 which, upon the quantity required for your road, say 22,100 tons, would be \$190,060.

Should the iron be purchased of American manufacturers, delivered at Richmond, the cost, when placed in the depot at Lynchburg, would be as follows:

Contract price at Richmond	\$55 00
Cost of transportation to Lynchburg	5 06
	\$60 06

The contract price here assumed, is \$5 per ton less than the rolling mills at Richmond are now manufacturing T rails for the Richmond and Danville railroad company.

The quantity required for the line of your road, is 22,100 tons.

If manufactured by this company, it will cost..... \$1,045,551

If English iron be purchased at present rates, and no allowance be made for difference in quality, the cost will be.... 1,058,611.

Difference in favor of American iron...

If the usual allowance of \$8 per ton, for superiority of American iron, be made, this result will be varied thus:

Add to the price of English iron as shown above, \$176,800, making its value	\$1,235,611
Take from this cost of manufacturing at the company's own works, say	1,045,561

Real saving to the company..... 190,060

If the iron be purchased of American manufacturers, the cost, when delivered (\$68 06) will be..... 1,227,768

Take from this cost of manufacturing, at company's own works..... 1,045,551

Gain by manufacturing..... \$282,217

From the results shown by these statements, it would seem to be sound policy for the stockholders to authorize the board of directors to build a rolling mill, to manufacture the railroad iron required in the construction of their road.

Apart from the question of economy, in the construction of your road, there are other considerations, which sustain the propriety of such an expenditure as will be required, if this plan be adopted. All must perceive, that, after the road shall have been built, this company will require a large amount of malleable iron, in the construction and repairs of the machinery of the road. The locomotive engines, passenger and burthen cars, should all be built, either in the shops of the company, or in those of individuals who may erect such works on the line of the road. The necessity for this is the greater, because our road will be, for a long time, at least, unconnected with any line of railway leading to places where such articles can be procured: thus incurring great delay and a heavy cost for transportation.

The question arises: will individuals embark in this business, if they have to look elsewhere for malleable iron, out of which these articles are, to a great extent, fabricated? It is thought not, and the experience of the country sustains the opinion, for we do not learn that any such establishments have been put up on the line of railroads not contiguous to works producing malleable iron.

But there is another view to which the attention

of the stockholders is invited. It is the influence which the manufacture of your rails would have in promptly demonstrating the value of the coal and iron deposits, existing on the line of your road, but which are now of no use to the country. For the manufacture of your rails, you will require annually, for the next four years, 6,225 tons of pig iron and 300,000 bushels of bituminous coal.—When the road reaches Montgomery, it will be on the confines of the coal formation, and in a country abundantly supplied with the richest iron ores. By adopting the plan now suggested, these valuable minerals will at once invite the capital and industry of the enterprising people of that region, because the company itself will become a large consumer of these articles, and thus perform the double office of carrier and consumer.

It may be urged that, if the company should not erect works for manufacturing the rails required in the construction of its road, individuals would, and thus the development of the mineral resources of the country be as certainly secured. Such a result cannot reasonably be expected in the present state of the iron trade, and should the company direct the board of directors to purchase American iron, the cost of the improvement would be greatly enhanced thereby. What this enhancement would be has been shown in the preceding statements.

If a contract could be made with individuals to manufacture your iron on the line of the road, at fifty-five dollars per ton, the difference would then be \$169,949 against the company; but if it be manufactured at Richmond, at a cost of \$55 per ton, and you then add to that the charges of transportation, the enhancement of cost, over what it will stand the company, at their own works, will be \$282,217.

The following is from the report of the Chief Engineer:—

If Virginia expects to prosper, a portion of her capital and industry should now be directed to manufactures. While railroads are being constructed to facilitate exchange of the various articles of commerce and intercourse of persons—to collect at favorable points the raw material and food required—manufactures should keep pace with them. In this way alone can the resources of the country reach their fullest development, and industry obtain its highest reward. When agriculture and commerce are stimulated by cheap transportation, and a consequent increase of population ensues, there must be new channels of industry opened to employ this increase of population. The growth of cities, especially, depends upon a proper regard being paid to manufactures. And surely Virginia now offers a field for this application of capital which might satisfy the most cautious.

The imports of the United States, for the year ending June 30th, 1848, were \$154,997,928, and as the population is now about 20,000,000, we have \$7.75 per capita, as the amount of imports consumed by the citizens of the United States. It is very certain that Virginia consumes more than this average of the products of other States and of foreign countries. States chiefly agricultural, as Virginia is, must necessarily make larger importations in proportion to population, than those in which manufactures flourish. The amount of foreign merchandise, consumed in the island of Cuba, is between \$40 and \$50 per capita.

When we reflect that the commonest articles of every day use are now imported from the North—even the brooms, axe-helves and wooden buckets, sold in all the stores of Lynchburg, are manufactured in New England—some idea may be formed of the amount of money sent out of Virginia annually, to build up cities beyond her borders. An enumeration of the infinite variety of things made in the Northern States and brought here for sale, would make a curious catalogue. The very pen with which this remark is written and all the machinery to be used in publishing it, are imported. It would not be extravagant to assume that the importation per capita of Virginia was three times that of the average of the whole Union. But, we will put it down as only \$10 for each inhabitant.

The population of the State is about 1,300,000, which would give \$13,000,000 as the sum now annually sent abroad, by our people for articles which might be made at home. But, to avoid all risk of

the charge of exaggerating the importance of this subject, let us reduce this estimate to \$10,000,000. But the truth of this result may be tested by another mode of reasoning. The estimated value of the whole product of Virginia is \$70,000,000. Can any man doubt that Virginia pays more than one seventh of her gross production for the fabrics of other States and foreign lands. Is not this enough to encourage the capitalist, to embark his money in such establishments in our State? And yet, even this heavy demand will increase with the supply. Every mile of railroad finished, every acre subjected to the plough, every wheel turned for the conversion of raw material into fabrics, will increase the consumption of manufactured articles.

The difference, in enterprise, between the Northern people and Virginians, may be seen most strikingly in the readiness with which the former avail themselves of natural advantages. A railroad was made across the Connecticut river, at a point where there was a considerable fall in the stream, and immediately a company was organized with a capital of \$4,000,000, to dam the river, build a town and erect manufactories. This has been done within some two or three years. The dam 30 feet high, has been finished, a great many houses have been built, they are now erecting the largest hotel in New England, and the town of Hadley now numbers 5000 inhabitants. One man in the neighbourhood has refused \$100,000 for 40 acres of land, which two years ago, would not have commanded \$5000.

There is a dam, erected by the James River and Kanawha Canal Company, and a water-power nearly equal to that at Hadley, within five miles of Lynchburg, and so little attention does it attract from the citizens of the town, that one would scarcely think that they regarded it as more than a object of idle curiosity.

Why is this difference? It is not liberality that induces the Northern capitalist to invest his money in railroads and manufactories. It is enlightened *educated selfishness*. They have tried the experiment and they know that enterprises of this nature will bring wealth to themselves while they secure general prosperity to the country. With them the man who is most desirous to receive a large interest on his money, is the first to engage in works of internal improvement and manufactures. What else, but this spirit of enterprise, directed in these profitable channels, has built up the magnificent fortunes of those merchant princes of Boston?

There is, at this moment, a field open in Virginia for the profitable investment of capital, such as no other part of the Union presents. With her great coal fields and rich beds of iron ore, with her boundless water power, and favorable climate & soil for the production of food, and with her home demand of \$10,000,000 worth, annually, of manufactures, Virginia may compete with any people in the markets of the world.

While railroads thus create, in a country, the absolute necessity for manufactures and render them profitable by the facilities they afford, the reaction is no less beneficial to the railroads. It is a source of large profit to the roads to convey the raw material and food to the factories and carry the articles fabricated to market. Moreover a dense population cannot exist without manufactures, and consequently, agriculture itself, as well as every other branch of industry, cannot reach its highest development without them.

Hence it becomes a matter of the very first importance, for a railroad company to encourage every species of manufacture at their termini, and along their line, during the progress of the work. Every enterprise of this sort will make itself felt in the future dividends on the stock of the road. The profits of the road will increase with the improvement of the country, in all the important applications of labor and capital. It is, therefore, submitted to the board, as a question for serious deliberation, how far they may, by their own action, based on principles of strict self-interest, extend a liberal encouragement to the manufacture of every thing required for the completion of the road, in our own state.

We really believe that this road is to be the *Moses*, which is to lead Virginia out of Egypt into a better land. By common agreement, the test of

the prosperity of a State is the degree of its wealth and population; and that of the superior character of its people compared with others, is the energy and industry by which the resources they possess, are made available to the wants of life. With these tests how stands the account between Massachusetts and Virginia? In natural advantages, Massachusetts is superior to Virginia in no one particular. As far as these are concerned, the former is the poorest State in the Union. She is poor in soil, poor in mineral wealth, and possesses a most disagreeable climate. She has commercial advantages, but not to be compared to those of Virginia. This latter State on the contrary is most opulent in every natural resource, in a fertile soil, in inexhaustible mines of iron and coal, in a most genial climate, and is penetrated deep into her interior by magnificent estuaries, presenting greater commercial facilities than can be found in any other State in the Union. What results do we witness on looking at both? Virginia has an area of about 70,000 square miles and Massachusetts of 7,000. The population of the former is not far from 1,300,000, and of the latter, 900,000, making 18 inhabitants to the square mile in one and 128 in the other. How is it with the wealth of the two?—Massachusetts has now expended not far from \$75,000,000 upon her own, and on other New England railroads, and this is but a fraction to what is invested in her commerce and manufactures. She possesses capital equal to any task to which she sets herself down to accomplish. Her rich men have but to will, and large and flourishing towns spring into existence as if by enchantment. With her every branch of industry is prosperous, agriculture is stimulated to the highest degree by the great demand created by her numerous manufacturing towns. The most sterile portions of her soil are worth more than five times as much as the most fertile land of Virginia, and unless there is speedily some change in the policy of the two, Massachusetts with her 7,000 square miles, will soon number more inhabitants than Virginia with her 70,000.

Such is the present comparative condition of these States. We ask any Virginian whether, taking the natural advantages of the two, with the same industry and energy, and by pursuing a similar policy, the reverse of the picture we have drawn, would not have been presented? The first step toward a change of this picture has already been taken. The cause of this wide difference is already felt and admitted, and the true course to be pursued is pointed out in the extracts we have given. Virginia must give up her metaphysics, her political speculations, her traditions, the memory of her former greatness and influence, the food upon which she has for a long time lived, and catch something of the genius of the present age, which consists in the actual, in doing. While one section of the country have been training the lightning and adapting the steam power to minister to all the arts of life, Virginia and the south have been discussing questions of constitutional right, or endeavoring to decipher the opinion of some departed saint in their political calendar, upon some question which ceased, perhaps, to have any significance 50 years since. All constitutions exist only in the future, and all law is to be the expression of popular will for the time being. The south has been "the dead burying the dead." Let it arise, and shake off the lethargy which has so long bound it. Let it commence making iron and cloth, steam boats and the steam engine. This will develop

their resources, and not only make them prolific, but will attract the immense tide of foreigners, who now exclusively settle down in the north.—Such a policy will give the south what she once possessed, a preponderance in the population of the country, and we shall hear no more of the necessity of defending their rights from northern aggression; for they, from the force that will be developed within them, will become the aggressors. The sceptre of dominion in this country will never be held accidentally. It will always remain in the hands of those who, by their superior mental and physical characteristics, are entitled to wield it.—The vast progress that has been made in the physical sciences within 20 years, has entirely changed the old order of things. So potent are the new influences at work, that those who have availed themselves of all these new agencies are as far in advance of those who have not as the latter class are in advance of what society was hundreds of years ago. Those States or countries that wish to maintain their position, must continue to take the lead in appropriating to their use all the aids that science and discovery are multiplying with such wonderful rapidity.

Engineering.

We have obtained permission from A. C. Morton, Esq., Chief Engineer of the Atlantic and St. Lawrence railroad, to publish the specifications annexed to the contracts, pointing out the manner of grading or forming the road-bed of that road as far as constructed. The practical value of this specification will be fully appreciated by the younger men of the engineering profession, and it will serve as a valuable text to all men engaged in railroad construction.

We invite the attention of engineers to this department of the Journal, and ask of them to give through its pages the practical results of their experience:

SPECIFICATION of the manner of grading or forming the road-bed of the Atlantic and St. Lawrence Railroad:

The ground occupied by and set apart for the railroad is to be cleared for a space of three rods on each side of the centre line, of all trees, stumps, bushes, logs, rubbish and vegetable matter; the trees, stumps and bushes to be cut close to the surface of the ground and the whole to be removed or destroyed by burning or otherwise as the engineer shall direct.

When embankments are less than four feet high, all the large stumps, large roots and other vegetable matter must be thoroughly grubbed out and removed, or destroyed as specified above. All valuable timber within the limits of the roadway to be cut into such lengths as the engineer shall designate and piled up in convenient heaps and in such manner as to preserve it from decay.

Where the road is graded for a single track it will generally be fifteen feet wide on the embankments, and twenty-two feet wide at the foot of the slopes in excavations. The side ditches are included in the last mentioned width, and will usually be five feet wide at the surface of the road-bed and 14 feet deep.

Where the road is graded for a double track, the road-bed will have a surface width on embankment of twenty-six feet, and in excavation thirty-four feet, the side drains being generally for the same dimensions as above stated. The slopes of the excavation and embankments will usually be one and a half feet base to one foot rise.

In rock cutting they will not vary much from four inches horizontal to one foot vertical.

Such variation in the width of the excavations and embankments, the slopes and dimensions of the side drains to be made as the engineer shall from time to time direct.

When the excavations are in clay or other ma-

terials unsuitable for the road-bed, the contractor shall excavate to such depth below grade as the engineer shall direct, and if there is any good gravel or other suitable material, on or near his work not likely to be affected by frost, the same shall be placed on the road-bed, covering the whole surface between the side drains to a depth not exceeding two feet. Clay embankments are in like manner to be covered with gravel of a sufficient depth to guard against the action of frosts.

When embankments are formed by carting they shall if required be made in layers not exceeding four feet in thickness, and in all cases the slopes of the banks shall be made full in the first instance and carried up faster than the centre, and all vegetable or loose earth which shall be unsuitable for embankments shall be removed; and no stumps, logs or other perishable material shall be placed in the embankments.

All embankments which are carried up to grade with materials taken from cuts, must be entirely free from stone to a depth at least of two feet below grade and the best materials must be reserved for dressing off the surface.

Between the foot of the slopes of the embankments and the side drains there shall be a space or berm of such width as the engineer may direct.—All the earth excavated from road-bed is to be carried into embankments unless otherwise directed by the engineer. The surplus material, if any, to form double track embankment, and where there may be a deficiency of material to form the embankments, the excavations for road-bed will be made for a double track, or the earth procured from side cuts at such points and transported such distances as the Engineer may direct. The surplus earth from excavations which cannot be carried into embankments shall be deposited in a regular manner on either side of the excavation, with such slopes as the engineer shall direct, and so arranged as to convey the drainage or fallen water from the road, leaving a space or berm of not less than fifteen feet in width between the same and the outside line of excavation. The space or berm so left to be excavated in such a manner, and such drains cut as to direct the water which may collect upon it from the railroad. In all places where spoil banks or banks for diverting the drainage water from the railroad are formed, the trees, if any, are to be cut down and removed or destroyed.

Every description of material required to be removed and raised in forming the road-bed, is to be estimated as excavation, and the quantity ascertained by measuring either the excavation or embankment as the engineer may determine, and making such allowance in measuring embankments for shrinkage as he shall deem proper.

The earth and rock are to be raised and deposited within a distance not exceeding 500 feet, for the price stipulated for excavation. For removing earth and rock each additional 100 feet, the contractor will be paid in accordance with his price for haul.

The embankments and excavations required for road and farm crossings, bridges and changing the channels and beds of streams, shall be of such dimensions and slopes as the engineer shall prescribe, and the price for all such excavations and embankments shall be the same per yard, as for similar work in the road-bed on the section to which this work may belong.

The various kinds of excavations to be classified according to the judgment of the engineer under the head of earth or rock. The earth to be classed as said engineer in his judgment shall think proper, under one of two heads and contracted and paid for as such, to wit: common or ordinary earth; 2nd, indurated or cemented clay, sand or gravel, separate or combined.

All rock which may be excavated will be ranked under two heads, to wit: loose rock or solid rock, and paid for as such.

Loose rock covers all stones measuring over one cubic foot and not exceeding four cubic yards, and before estimated must be piled into heaps convenient for measuring.

Solid rock comprises all rock in place which requires blasting, and all detached stones or isolated masses measuring over four cubic yards.

Where suitable material for slope wall or masonry can be obtained from the rock excavations,

the same shall be deposited in some accessible place from which it can be removed and used for the purpose designed.

Where upright supporting walls are required, for the protection or support of embankments or at the foot of slopes in cuts, they will vary in dimensions and slopes according to circumstances, and will be sunk in such depth as is necessary to secure a solid and permanent foundation. The stone used in the walls must be of a firm and durable character, well shaped and of sufficient size to insure stability. These walls must be constructed as to form a complete bond throughout their entire thickness, the beds of the stones being laid at right angles with the battered face and the whole neatly coped with flat stones, two feet wide and three feet long.

Slope walls will be of such thickness as the engineer may direct. The slope being nearly the same as that of the embankments.

Where these walls are founded in deep water, rip rap foundations will be made of large stone and brush laid in alternate courses so as to form a bond.

Refuse stone and other coarse materials found in the excavations shall be placed in the outside of the embankments and next the walls; and all stone embankments deemed by the engineer necessary to protect the wall and banks shall be made by the contractor.

Public or private roads which intersect the line of the railroad shall not be obstructed by excavation or otherwise until direction shall be given by the engineer for completing the road across the same; nor shall any crops or vegetables or fruit trees or buildings of any description or fences be disturbed unless by the direction of the engineer.

Changes in the position of the road with a view to perfecting the alignment of the same by straightening or giving more ease and symmetry to the curves, together with variations in the grade line, may be made by the engineer, and no extra allowance shall be claimed therefor.

Before the road is considered finished the excavations and embankments must be neatly trimmed, and the whole surface made to conform accurately to the slope stakes and the plane of graduation.

The culverts on the road will be of two kinds.—The square or box culverts will be of dry rubble-masonry—they will be from two to four feet span, and from two to five feet high—the thickness of the walls varying according to circumstances—the stones of which they are built must be strong, durable and well shaped, and laid in such a manner as to form a perfect bond throughout. They will be covered with large flat stones lapping not less than one foot upon each side wall, and being from nine to eighteen inches thick, as the engineer shall deem necessary, fitting together so that the embankment shall not run through the culvert. The foundations will be paved with flat stones set edgewise, in regular courses across the culvert, to be not less than twelve inches in depth; and after the pavement is completed, it shall be thoroughly rammed down with heavy beetles, and the interstices well filled in with gravel. When required a course of water tight sheet piling shall be placed across the culvert at each end, extending not less than three feet below the bottom of the paving to prevent undermining. The end walls of these culverts will be of hammer dressed masonry, with a regular coping two and a half feet wide and not less than six inches thick, projecting three inches over the general surface of the wall, laid in full mortar and pointed.

The arched culverts will be of not less than six feet span. Where the foundation is not rock, they will be built on a pavement similar to that described above—or if the engineer deems it necessary, upon timbers hewn on two sides, and laid two feet from centre to centre crosswise of the culvert. The timbers when hewn, must be eight inches thick, and the spaces between them filled with gravel well rammed. Their upper surfaces will be covered with three inch plank, laid lengthwise of the culvert, well spiked or pinned, and the ends must be secured with sheet piling as in the box culverts.—When the foundations are upon soft ground, piles are to be driven and capped with timber, upon which a course of 3 inch plank is to be spiked.—The spaces between the piles and also the cap tim-

bers to be filled with gravel and well rammed down.

The dimensions of the arch stone to be such as to extend through the thickness of the arch, to be placed perpendicular to the curve of the same, and to be well and closely fitted.

The outer or ring stone of the arch to be equal in length and as nearly uniform in thickness as possible and to be plain dressed either with a bush hammer or chisel, and to be well bonded with the contiguous arch stone, breaking joints at least 8 inches.

The wing and end walls of the arch culverts are to be formed of the larger and better shaped stone, hammer dressed on their exterior faces, and pointed with cement, and both are to be surmounted by a coping of broad stone of a thickness specified in the plan. The coping stone to be handsomely hammer dressed and brought as near to a uniform thickness as possible, and placed firmly and securely upon the walls in a bed of cement. The coping and ring stone as also the arch and cap stone to be included in the estimate with other masonry, without extra charge. The abutment walls when laid dry must be of large and good shaped stone, well dressed and laid so as to form a perfect bond having good beds and joints.

When the abutment walls are laid in cement they must be of good rubble masonry and built of strong durable stone, of good shape, well bonded, laid in full mortar, made of the best hydraulic cement, and clean sharp sand thoroughly mixed upon a platform of boards in such proportions as directed by the engineer, and applied to the work within the proper time for rendering the adhesion and solidification most perfect. The vertical joints will be grouted, and the grout must be made of cement and sand, first formed into well tempered mortar, and then reduced in a box to the proper consistency for running freely by admixture of water.

Cattle guards and passages will consist of two walls of dry rubble masonry of a substantial character placed from 4 to 6 feet apart, and coped for the reception of a sill on the top of each wall. Where these are designed to pass the water of side drains of common roads, or the drainage of adjoining fields, the same foundations will be adopted as for culverts.

When these passes are constructed of wood, they will consist of two bents placed at the requisite distance apart, and faced with three inch plank. The bents will be retained in their proper position by cross timbers substantially framed on the sills and cap pieces.

The abutments of bridges for passing the ordinary roads of the county over or under the railroad are generally to be of good rubble masonry, laid dry, and in a substantial and workmanlike manner. The stone to be large and of good shape and quality, and to be well bonded throughout. At points where from the position of the bridge or the nature of the ground a better description of masonry is requisite, it will conform to the masonry required for large bridge abutments.

The masonry of bridge abutments and piers will be hammer dressed beds and joints with rough faces, or what is termed *rock work*, having an arris of one inch cut around the face of each stone, and laid dry or in cement as the engineer shall direct. The ends of the piers will usually be triangular shaped, and for the up stream ends the faces of the stone shall be dressed smooth, having the requisite batter to form ice breakers when laid. The stones used must be of large size, laid in courses of not less than 12 inches thickness in such manner as to be well bonded throughout, by a system of alternate headers and stretchers. The headers must be at least four feet long. The stretchers in the face must have at least eighteen inches bed, and at least six inches more bed than face, and the backing stones must have as much bed as face. The coping stones of the abutments and those on which the superstructure rests must be dressed smooth, and laid in full mortar.

The foundations will be of such description as the character of the ground and the work require, and may in some localities consist of piles driven in the manner indicated by the plan, and the spaces filled in with layers of concrete, or if the engineer deems proper, the heads of the piles will be

dressed off and timbers framed on to them upon which one or two courses of plank will be firmly spiked.

Where piles are not required, timber and plank foundations will be adopted, the materials being of such dimensions and laid in such form as may be thought necessary to insure a firm and uniform bearing.

The foundations for the abutments of small bridges will, when the character of the ground admits, be formed of paving in the same manner as for culverts.

The proportions and dimensions of the several parts of the culverts, bridge abutments, and other mechanical works will be represented in the plans.

No masonry shall be laid in mortar (unless by special direction) between the first of October and the first of April.

All materials intended to be used in culverts and bridges, must be examined and approved by the engineer—and those considered by him unsuitable, must be immediately removed to such distance as he shall deem necessary, in order to prevent them from being used in the work.

The whole to be executed in a substantial, faithful and workmanlike manner, subject to the constant supervision and inspection of the engineer, who shall give such direction from time to time, additional and explanatory to the above specification, as occasion may require.

It must be explained that this document is intended to make the contractors acquainted with the general details required. The detailed specification of the work are of course placed in the form of a definite agreement, or supplied from time to time by the engineer as the work progresses.

In order to secure the faithful execution of the work, the following conditions are inserted in the contract:

It is also agreed that if any work shall be done by said contractor which is not included in this contract, the price and value of said work shall be determined by the Engineer. And it is likewise agreed, that the said work, during its progress, shall be subject to the supervision and inspection of said engineer, and shall be made to conform in every respect to his directions, and all bad or imperfect work to be immediately remedied, and the same rendered good and substantial, to the satisfaction of said engineer.

And it is further mutually agreed, with a view of preventing all disputes and misunderstandings, and for the speedy adjustment of such as may occur, that the engineer aforesaid shall determine the amount or quantity of the several kinds of work herein contracted to be done, and shall decide every question which can or may arise relating to the execution of the work under this contract on the part of said contractor, and his decision shall be final and conclusive.

And it is hereby further agreed, that, if the said contractor shall, in the opinion of the engineer, refuse or unreasonably neglect to remedy any imperfection which may be pointed out by said engineer, or in any manner violate the conditions of this contract, so that, in the judgment of said engineer, there shall be reasonable apprehension that the same will not be completed in the manner and within the time specified; then the engineer shall have the power, and it shall be his duty, to declare and pronounce this contract void and of no effect, and the said company may enter into a new contract with any other person or persons for the execution and final completion of the same.

And it is further agreed, by and between the parties to this contract, that in case any difference of opinion shall arise between the parties hereto, as to the construction of this contract, and the true intent and meaning thereof, and of the parties in forming the same, that such difference shall be considered and decided by said engineer; and the said parties do hereby submit all and singular the premises to his award, arbitration and decision, and agree that the same shall be final and conclusive between them, to all intents and purposes.

Illinois.

Rock Island and La Salle Railroad.—The committee to collect subscriptions for this road have

succeeded in getting all the stock taken up of \$32,900 of the three hundred thousand required.

The expense of building the road has generally been estimated at \$10,000 per mile, but it is thought that it can be constructed for an average less than \$8,000 per mile—the cost of the Galena road 36 miles out, having cost \$6,000 per mile. So level is the ground between Rock Island and Peru, that the greatest ascent per mile does not exceed fifteen feet, and generally ranges at from four to five feet. It is presumed that the company will be organized and the first instalment be levied, during the latter part of the ensuing month, and the work commenced in the spring.—*Chicago Democrat*.

Railroad Organization.—We understand that the Directors of the Alton and Sangamon Railroad Company have made choice of the following officers viz:

HENRY A. COIT, Esq., *President*.

E. MARSH, Esq., *Treasurer*.

ISAAC GIBSON, Esq., *Secretary*.

J. J. SHIPMAN, Esq., *Chief Engineer*.

C. F. JONES, Esq., *Resident Engineer*.

These gentlemen are now actively engaged in making the necessary preparations for the immediate commencement of the work; which, we doubt not, will be prosecuted to completion with all the expedition which skill and energy can effect.

Fox River Valley Railroad.—We are informed that efforts are making to extend the railroad from Aurora, down the valley of Fox, to Ottawa.

This will be another link, and a very important one too, in the great chain which is to connect Chicago with Galena, Cairo, Alton, St. Louis, and the flourishing towns and rich country of central Illinois.

The valley of the Fox is perhaps the richest agricultural and manufacturing portion of the State. There are a host of independent farmers on the banks of the river, a large number of extensive manufactories of flour, woolen goods, paper and implements of husbandry of all kinds; and a number of flourishing towns.

All of these interests, when combined and acting in concert with a determination to accomplish the objects are abundantly able to furnish the capital necessary to insure the completion of the road.

Competent engineers, familiar with topography of the country, and who have made surveys of the river for other purposes, say that the route is favorable, with easy grades, at an average cost per mile of the other roads in the State, that there will be very little difficulty, either in grade or expense, in getting in or out of the valley of the Illinois, or of crossing that river. The distance is about forty miles.

Geneva and St. Charles Railroad.—A meeting of the citizens of Geneva, Kane county, was held on the 16th inst., for the purpose of taking into consideration the expediency of constructing a railroad from that place to St. Charles. A committee had previously been appointed to confer with the directors of the St. Charles Branch Road, and their report was received. The proposals made by said Directors were considered favorable, and were acted on by the meeting. It was resolved to build a road, provided enough stock can be raised. Committees were appointed to secure the right of way, and to obtain the requisite amount of stock.

Lumber trade of Chicago.—An estimate is now being made from the books of the various lumber merchants, which is nearly completed, by which it appears that the enormous amount of 65,000,000 feet of lumber has been received in this city the past season.

The amount of lumber received in St. Louis last season was but 37,588,631 feet. This will give some idea of the immense business that Chicago does in one article of commerce.—*Chicago Democrat*.

The Lakes.

The entire line of Lake coast is 2000 miles. The following is the result of the survey of the United States Topographical Engineers.

Lake Champlain 150 miles, greatest width 19, average width 8; Lake Ontario 160, greatest width 51, average width 40; Lake Erie 240, greatest

width 57, average width 37; Lake St. Clair 18, greatest width 25, average width 18; Lake Huron 970, greatest width (not including the extensive bay of Georgian, itself 120 miles long, averaging 45 miles in width) 150, average width 70; Lake Michigan 340, average width 58; Lake Superior 420, greatest width 135, average width 100. These lakes may be considered as connected throughout their whole extent. Lake Champlain connects with Lake Ontario by means of the river Richelieu, the lock and dam navigation of St Lawrence river, Ottawa river, the Rideau canal throughout Canada, and the Champlain and Erie canals of New York. Lake Ontario is connected with Lake Erie, by the deep and navigable strait of Detroit, twenty-five miles long. Lake St. Clair is connected with Lake Huron by the navigable strait of St. Clair, thirty-two miles long. Lake Huron is connected with Lake Michigan, by the deep and wide strait of St Mary's forty-nine miles long.

Admission of New States.

We find in the New Orleans Picayune a particular account of the admission of each new State, since the establishment of our national independence. Vermont was the first. She was received in 1791. No constitution was submitted to Congress, or inquired for by that body. In fact the permanent constitution of the new State was not made until 1793. Kentucky came next. Her territory once belonged to Virginia, but was detached by act of the Legislature of Virginia in 1789. In 1791 an act of Congress directed that Kentucky should on the first day of June, 1792, "be received and admitted into the Union as a new and entire member of the United States of America." The State constitution was not framed when the act of admission was passed.

The third State was Tennessee, formed out of territory ceded by North Carolina to the United States on condition that it should become a State. The people of the territory framed a constitution in 1796, submitted it to Congress, and the State was admitted. This was the first State constitution ever submitted to Congress with an application for admission.

Ohio was the fourth of the new States—"the first, (says the Picayune) formed of territory to which boundaries were affixed and previous governments assigned by the exclusive authority of the United States." It constituted the Eastern District of the North Western Territory, to all of which the ordinance of 1787 applied. The act of admission, which was passed in 1803, recites that the people of the Eastern District of the North West Territory had formed for themselves a constitution and State government, "whereby the said State had become one of the United States." This phraseology is noted as peculiar.

Louisiana, Indiana, Mississippi, Illinois and Alabama were admitted severally in the order named, and in the case of each there was a previous act of Congress authorising the calling of a convention to organize a State government.

Maine, originally a part of Massachusetts, came in as the tenth new State. It appears that there was no action of Congress previously in her case; but the Legislature of Massachusetts gave consent in 1819 that the people of the District of Maine should form a State constitution. This was done and the State of Maine was admitted in 1820.

Missouri, the eleventh in order, formed out of the Louisiana territory, applied for leave to form a State constitution: and it was upon this application that the restrictive clause concerning slavery was attempted to be applied. This gave rise to the Missouri compromise, and upon the adjustment of all conflicting matters the State was declared a State

of the Union in 1821 by the President's Proclamation.

Arkansas and Michigan were admitted by one act of Congress in 1836—the former without condition, the latter prospectively—there being some questions of boundary involved. The constitutions of both States were made by conventions of the people without any previous act of Congress. The same was the case with Florida, which was admitted along with Iowa in 1845. There was a condition relative to boundary applied to Iowa which she did not comply with in form, but did substantially by presenting a new constitution, which being accepted by Congress, she came into the Union in 1846. The mode of the admission of Texas is familiarly known. Wisconsin, the last of the new States, went through the regular form of territorial organization, and formed its State constitution under authority of an act of Congress.

Indiana.

Terre Haute and Indianapolis Railroad.—We learn from the first annual report of this company, under date of January 5, 1850, that the grading and bridging of the whole line, with the exception of about 20 miles, has been put under contract. It is estimated that the whole work of grading can be completed by the first day of January next, and that the road can be prepared for running by the first of December, 1851.

The following extract from the report, shows the financial condition of the company, and the estimated cost of various portions of the work.

The cost of grading and bridging the road from Terre Haute to Indianapolis, ready for the superstructure, according to the Engineer's estimate, will amount to \$317,188. To meet which, we have a subscription to stock, including the amount payable to Contractors on their contracts, of \$232,600; to which add 30 per cent. on the balance of the grading and bridging, not under contract, payable in stock, amounting to \$34,156; and the Commissioners of Vigo county will subscribe fifty thousand dollars, payable in the bonds of the county, at any time when called upon by the Company to do so—making in all the sum of \$316,756, which amount will about cover the expenses of preparing the road for the superstructure; and when this is done, we trust that it will give such increased confidence in the work, that we shall have but little difficulty in procuring a further subscription of stock sufficient to put on a good gravel bed and lay down the superstructure, which is estimated to cost \$130,000, thirty per cent. at least of which can be paid in stock, leaving but \$91,000 payable in cash. When the grading and bridging is finished, and the means procured to lay down the superstructure, we have every assurance that we can procure the iron, and stock the road with Engines, Cars, &c., by a sale of the Bonds of the Company, secured by a mortgage on the road.

Our readers will recollect that the proposed road is 72 miles in length. The officers are C. Rose, Terre Haute, President.

T. A. Morris, Indianapolis, Chief Engineer.

W. D. Wood, Terre Haute, Asst. Engineer.

Ohio.

NEW RAILROAD PROJECT.

Our citizens are becoming much interested in a projected railroad from Wellington to Toledo, as the connecting link in a great western railroad that must soon be built. By tapping the Cleveland and Columbus road at Wellington, some forty miles in the great chain will be saved—and it is said that the difference in distance between this route and the one directly upon the lake shore is not worth mentioning—the road from Wellington, by avoiding the deep ravines, costing much less for construction than the other. Norwalk, Monroeville, Bellevue and Fremont, (Lower Sandusky), being made points. The project is a good and feasible

one, and we trust it may eventuate in something more than mere talk.—*Norwalk Exp.*

Columbus and Xenia Railroad.—The rails for this road are all laid, and it is expected that the locomotive will be through to-day from Xenia. We learn that regular travel will not be commenced in less than two weeks.

We have just returned from a visit to the car factory of Messrs. Ridgway & Co., and report that four large passenger cars are nearly finished. They are "first class" in all respects. The execution appears equal to the first class cars of the eastern roads. The style and finish is rich, and the arrangement such as to ensure comfort. We think it will be a vast improvement in the little contracted nine passenger coaches, wherein the public are packed so uncomfortably at present.

The time to Xenia, from Columbus, will be two hours, including stoppages. This is something over 25 miles per hour.—*Columbus Jour.*

Waterville, Me., Feb. 18, 1850.

MR. EDITOR.—Permit me to inquire, if Mr. Johnson did not make a slight mistake in his calculation in his article in the Railroad Journal of Feb. 9th, on Railway Wheels? I presume it was an arithmetical error merely. In computing the line KL he must have made some mistake. Solids are to each other as the cubes of their similar sides;—hence the whole solid is to one half of it as the cube of CB is to the cube of LC; or CL equals CB (or .5 multiplied by the cube root of .5; or CB equals 39685 nearly. This makes NL 222685 . But NB is 10 NL as AB is to KL. Whence we find KL equal to 3823 nearly, and the proportion 31416 to 3823 , or as 1 to 1.217, or what Tredgold has 124 per cent. and Johnson 181.5 per cent, we find to be 21 2-3 per cent. nearly. This of course must affect the conclusions of Mr. Johnson somewhat, but only strengthen his position against Tredgold.

Yours truly,

J. H. D.

Tennessee

Nashville and Chattanooga Railroad.

The second annual report of the directors of this company was submitted to its stockholders at a meeting holden at Murfreesboro' on the 12th of December last.

Since the last report, important reductions have been made in the estimated cost of the road, which was originally estimated at \$2,810,000. This has been reduced to \$2,233,627. This includes an additional cost in weight of iron, amounting to \$40,185, and the cost of the Shelbyville branch \$52,843, which two sums deducted, leaves the cost of the road, including the iron, for which estimates were originally made, say \$2,140,599, and the cost of equipage, depots and station houses, say \$320,000 in all, making up the sum of \$2,460,599. Take this amount from the original estimate including grading, bridging, timber, iron, engineering, etc., at \$2,810,000, and depots, station houses, cars, etc., at \$320,000 in all, \$3,130,000, it leaves a balance of \$669,410 saved on the original estimate, upon which the stock was subscribed.

The directors availing themselves of the low price of iron, have bought 10,340 tons, which is enough for the main line from Tennessee river to Nashville, 122 miles, and the branch to Shelbyville 8 miles, and side tracks, and turnouts, together with wrought iron chairs and spikes for the same.

This iron costs the company, delivered at Nashville, 1200 miles in the interior by water, about \$45 per ton of 2240 pounds, or about two cents a pound, duty and all charges paid. A saving was made to the company of nearly twenty thousand dollars, under the best prices that could be obtained

J. M. Cunningham, Miss.; John W. Campbell, Tenn.; Benj. E. Grey, Ky.; Sidney Smith, Francis B. Clark, Jona. Emanuel, John Bloodgood, David Stodder, George N. Stewart, Moses Waring, Charles LeBaron, Charles Gascoigne, J. A. Campbell, of Mobile.

The two last only are new directors. It is an excellent board, composed of gentlemen of intelligence, energy and wealth; entitling them to the fullest confidence of the stockholders and the community. That they will do their duty, no one can doubt. They are men who when they resolve know no such word as *fail*. We feel fully authorized to say the work will go ahead.

Explosion of a Locomotive Engine on the Camden and Amboy R. R.

On Friday of last week, the Engine No. 29, on the Camden and Amboy railroad, exploded in the neighborhood of Bordentown, killing instantly the engine driver, and another engine driver who was riding in company on the engine, and mortally wounding a fireman who has since deceased.

This is the third occurrence of the sort we have had occasion to chronicle, since our connection with this Journal, or in about one year past, upon the railroads in this country. Our views, so fully expressed on this subject last season, through the columns of this paper, have undergone no change.—Every accident that has since occurred has confirmed our belief, then expressed, that these accidents are the result of culpable neglect, or inattention, and are not to be referred to any such extraordinary theory, as that assumed in Captain Parrott's report, read before the Boston Association of New England Railroad Superintendents, in the case of the Tagonic on the Boston and Providence railroad on the 1st of February, 1849.

The attempt also to throw the blame of these awful disasters upon the builders of locomotive engines, is in our estimation entirely unwarranted by the general testimony of the facts found in each case.

This case on the Camden and Amboy railroad is strikingly in point, in confirmation of these opinions. The doings of the Coroner's inquest are as yet only known to the public by the results of their deliberations. They report that the accident was caused "*by allowing the water to become low in the boiler.*" Here, in our estimation, is the secret of every explosion that has occurred in a locomotive engine. Here is the place to look for the causes of all these casualties, and the time has arrived when railroad companies should look to the remedy for these disasters.

This is a topic of inquiry full of importance to the whole travelling public. Every man who travels by railway should raise his voice toward arousing the directors of railroads to look this question full in the face. Few, very few, who travel by railroad know anything of the fearful hazards they are encountering every time they travel, from the carelessness, the neglect, the want of skill, in those who take charge of engines.

The locomotive engine is the brain of the whole system. The engine driver is the master spirit of the whole. These men should receive the highest pay of any class of men in the service of the railway, not excepting superintendents, conductors, or even directors themselves. The lives of the whole travelling public are in the hands of the men who drive the locomotives. Their responsibility should be properly appreciated, and their qualifications made matter of the most serious inquiry. A long course of training, a thorough acquaintance with

the nature and uses of steam power, should be an indispensable prerequisite to their employment.—Their compensation should be graduated accordingly, and like the pilots of the Ganges, they should be held accountable for the lives and the property entrusted to their charge.

We intend to follow up this inquiry, and pursue this subject more into detail. We intend to urge upon the attention of legislators and railroad directors, the importance of passing such laws and such regulations as shall aid in carrying these views into effect.

In this case on the Camden and Amboy railroad, we have no doubt it was occasioned by the inattention of the engine driver. He took on a companion with him, and in the midst of their conversation, or their rallery, the engine was allowed to run on without any attention from him, till recollecting himself, and finding the water low in the boiler, he suddenly threw in a mass of water, upon the heated boiler surface, which exploded instantly, with a force beyond that of gunpowder; by the instant conversion of the water into a highly explosive gas. He and his companion paid a fearful debt for their indiscretion, and give a solemn warning to the living.

The inquiry arises, how could the company avoid the happening of such a catastrophe. The answer is a plain one: *By prohibiting the introduction of any one upon the engine but those necessary to run it.* In this case, as in thousands of others happening daily, the engine driver's attention is diverted from his duty by the presence of parties who should have been excluded from the place.

These suggestions are thrown out at this early stage, after the happening of the accident, while the public mind is still moved on the subject, in the hope of arousing the attention of those interested in this matter to the adoption of some measures that shall reach and remedy the evil.

Oronoco Steam Navigation Company.

The extension of our commercial intercourse, through the agency of steam navigation, is a matter of the deepest interest to our whole people.—Next to the railway, we regard steam navigation as the most important agency at work, towards carrying forward the great interests of business, and extending the blessings of good government, the arts, and the refinements of civilized life.

Some years ago, the government of Venezuela, in South America, granted to one Vespasian Ellis the exclusive right to navigate the Oronoco river for a certain number of years with steam vessels. This right was lost for reasons well known to our commercial men, and on the 11th of May, 1848, the government of Venezuela granted to Captain Turpin, for the benefit of Freeman Rawdon, Esq., of this city, the exclusive navigation of the Oronoco river with steam vessels for the period of 18 years, on condition that the grantees should within a specified time, place a suitable steamboat on said river.

For the purpose of securing this grant, and carrying out the intentions of the government, the grantees of this project in September, 1848, dispatched Captain Turpin with the Steamer Venezuela to the Oronoco river. This boat reached Angostura, or Bolivar, in January, 1849, and has plied on the Oronoco from Angostura to the mouth of the Apure, (pronounced Apoorre), about 250 miles, thence up the Apure to Neutreas, about 600 miles in all from Angostura.

Captain Turpin recently arrived in this country for the purpose of arranging to place two other boats on the same line.

The Venezuela steamer was built at Pittsburgh and is about 400 tons burthen. It is proposed to have the others of still greater size, and capable of conveying increased burthens of freight. The principal trade of the Oronoco is coffee and hides.

There is no other steamboat line in any one of the South American rivers, and we have no doubt that the success of the Oronoco Steam Navigation Company will soon induce other parties to obtain further grants, and make further improvements in navigating the stupendous, but comparatively unknown rivers of South America. We think it cannot be many years before the Amazon shall be penetrated with steam vessels, to a great distance into the interior.

For the American Railroad Journal.

St. Louis and Kansas Railroad.

Policy of Western Cities.

In a late number of the "Railroad Journal," I perceive by your extract from the Reveille that St. Louis is acting wisely. She has already taken steps to begin her "Great Western" railroad. It will perhaps, by a practicable route, touching the Maramec R., be about 300 miles to the western State line at the junction of the Kansas and Missouri rivers. This railroad will traverse nine fertile counties, populous for so new a country. It will cost at the estimate, when fully equipped for running, \$20,000 per mile, say \$6,000,000; and must earn some \$720,000 per annum gross, say \$360,000 net, to pay interest on its cost.

Now waiving all increase—and nowhere will a road create an increase of business more surely and rapidly than the Missouri road—I believe that with the California emigration now set in motion, if it were done now, it would be a paying railroad the first year. What then may we not expect for its future success?

But I set out to speak of the wisdom of St. Louis, as a city, in looking westward; leaving Illinois to take her time about "right of way," and all such selfish, silly, sectional legislation. Were I a citizen of St. Louis, I would be glad of the Eastern obstacle, seeing that citizens' capital is now looking westward for investment in an iron way.

About four years since, in conversing with the editor of a leading Pittsburg paper, I revived the subject of a Western railroad for Pittsburg, preferring that the effort to aid in an Eastern (central) road should lie over until a road should be completed to the western State line; believing that Pittsburg interests were mainly concerned in a western road towards the customers of the merchants and manufacturers of that city.

The editor concurred; and, as I understood, he took up the subject, and wrote several leaders to awaken attention thereto.

Unfortunately, a more "magnificent" scheme—including the fancy of a "back-bone" railroad route westward, seized a few leading men, some two years later, and unlike New York, who, in the infancy of her western railroad movements, was glad to get up different companies to make and extend her roads from point to point, Pittsburg must needs divide her limited surplus capital between an eastern and western project at the same time.

The Pittsburg editor, it is said, had, previously, most wisely, insisted on making the shortest possible line of railroad—say to the western line of the State—via the Ohio river: leaving to Ohio companies to extend it. The very circumstance of Pittsburg laying hold, and completing forty miles of railroad to State line, say at mouth of Little Beaver, would have enabled the Cleveland and Pittsburg

NAMES OF CANALS

REMARKS:

These canals were completed in 1847. As steamers will always *descend* the Rapids outside of these canals, they will not have to pass each other in them; and, consequently, the width of bottom is reduced 50 feet.

Completed, and in full operation

Completed. The Royal Mail Steamers now descend from Lake Ontario to Lachine, within nine miles of Montreal.
Completed in 1849.

Vessels of from 300 to 350 tons burden, may navigate these canals

The distance from Lake Erie to Montreal, the Head of Navigation for Atlantic Vessels, is 367 miles; and the total fall from Lake Erie to Tide Water is 564 feet.

Lock and Dam at Ste. Anne's Rapids, head of Montreal Island.....

Lock and Dam at St. Ours, on the River Richelieu

**Chambly Canal, connecting Lake Champlain and
Chambly Basin.**

• To contract the St. Lawrence route with the Erie Canal (State of New York)..... 1

* To contact the St. Lawrence route with that by the Erie canal. The dimensions, etc., of the latter are given below.

Erie Canal (State of New York).....	363	84	688	90	15	4	1	28	40
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These are the dimensions of the old canal, capable of passing boats not exceeding 75 tons burden.

railroad company, of whose enterprise a favorable notice appears in the *Railroad Journal*, No. 9, to get sufficient capital to extend the road from the State line to Cleveland, by the time the Pittsburg and State line road would be completed.

Had the wise suggestions of the said editor been then followed, October, 1849, would have found cars filled with passengers and merchandise arriving and departing, running over this track, 150 miles from Pittsburg and Cleveland! and moreover the western extension railroad, diverging from the Cleveland road at head of "Hahn's run valley," (some 80 miles west of Pittsburg,) towards Canton, Massillon and Wooster, Ohio, would at this writing have been well under way.

The money market had been sounded, and it only required the assurance that Pittsburg would forthwith make her 40 miles to the State line and stock it, costing say \$30,000 per mile, \$1,200,000, or less—within the means of Pittsburg alone—to secure the capital for the Cleveland road; and also for another company to begin the Western road, commencing some 80 miles from Pittsburg. It is a curious fact, moreover, that in going west, taking the Cleveland railroad track to said point of divergence, will be found to increase the distance to Cincinnati only about five miles!

And nothing is more certain (your account of progress of the said Cleveland railroad in No. 9 of the Journal, confirming the certainty) than that Pittsburgh would *now*, without embarrassment, have been in the enjoyment of the vast advantages of both a Western and a Lake road.

Pittsburg has lost three, perhaps five years, by her "tall" move for the "back-bone" route.

Three to five years of *Western railroad* advantages, in reaching their customers, are to the merchants and manufacturers of such a city as *Pittsburg* incalculably important. The loss of time is of itself an item in the lifetime of a merchant; and to the growth of a city, in these stirring railroad times, it is a loss that can never be wholly recovered.

It is even now probable from your extract concerning the Cleveland road, that notwithstanding the depressing influence of a competition for sixty miles at the southern end with a second road (the "back-bone")—and *two* were hardly necessary at the first—the said Cleveland road *may* reach Beaver yet, perhaps earlier than the "back-bone" road can be completed 80 miles to the point of crossing the Cleveland route.

And as to the road west of "Hahn's run valley," its construction is as yet, it would seem, far in the future.

I only allude to this great blunder of the city of Pittsburg—for *blunder* it surely was, as the policy of her leading paper, at the time alluded to, would have had her 40 miles of State line road finished and paying ten per cent. at the present; and the said investment, now aiding her Central Pa. railroad movements, instead of a source of embarrassment—to recapitulate that St. Louis and all similarly situated cities act wisely in first making roads in the direction of, and for the easy communication with their *customers*, whereby both sellers and buyers will be enriched; being careful to *finish* one section at a time, and put on the cars, to let it be earning money before proceeding further. Any other system I fear will be attended, by and bye, with a serious railroad revulsion, and great embarrassment among the holders of railway shares, and those who are liable for railway calls on unfinished lines.

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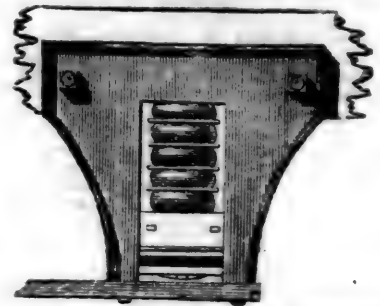
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A. W. CRAVEN, Secretary, etc.
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Mining Engineer and Surveyor, Eagle River,
Lake Superior.

Alfred W. Craven,

Chief Engineer Croton Aqueduct, New York.

Starks & Pruyn,
MANUFACTURERS OF ALL KINDS OF
STEAM BOILERS,

52 and 54 Liberty, corner of Pruyn street

Nathan Starks, **ALBANY** Special Partner
Wm. F. Pruyn, R. H. Pruyn.
Iron Railing, Bank and Vault Doors, Iron Shutters
Bridge and Roof Bolts, Heavy Jobbing and Forging
of all kinds.

For particulars see Adv. in another column.

To Engineers and Surveyors.

E. BROWN AND SON Mathematical inst. mak-
ers No. 27 Fulton Slip, New York, make and keep
for sale, Theodolites, Levelling inst., Levelling rods,
Surveyors Compasses, and Chains, Cases of Mathe-
matical drawing insts. various qualities, together with
a general assortment of Ivory Scales and small insts.
generally used by Engineers.

Samuel Kimber & Co.,
COMMISSION MERCHANTS
WILLOW ST. WHARVES, PHILADELPHIA.

AGENTS for the sale of Charcoal and Anthracite
Pig Iron, Hammered Railroad Car and Locomo-
tive Axles, Force Pumps of the most approved con-
struction for Railroad Water Stations and Hydraulic
Rams, etc., etc.
July, 27, 1849.

James Herron, Civil Engineer,
OF THE UNITED STATES NAVY YARD,
PENSACOLA, FLORIDA.,

PATENTEE OF THE
HERRON RAILWAY TRACK.
Models of this Track, on the most improved plans,
may be seen at the Engineer's office of the New York
and Erie Railroad.

To Railroad Companies.
—WROUGHT IRON WHEELS—
SAFETY AND ECONOMY.

NORRIS' LOCOMOTIVE WORKS,
SCHENECTADY, NEW YORK,
Are Manufacturing Wrought Iron Driving, Truck,
Tender, and Car Wheels—made from the best Ameri-
can Iron. Address **E. S. NORRIS.**
May 16, 1849.

Machinery Warehouse.

S. C. HILLS, No. 43 Fulton street, New York, has
constantly for sale Steam Engines, Boilers, Lathes,
Chucks, Drills, Planers, Force and Suction Pumps;
Tonnage, Morticing and Boring Machines, Shingle
Machines, Bolt and Nut Machines, Belting, Oil, Iron
and Lead Pipe; Rubber, Percha and Leather Hose,
&c., &c.

S. C. H.'s arrangements with several machine shops
are such that he can supply, at very short notice, large
quantities of machinery.

November 23, 1849.

Cruse & Burke,

Civil Engineers, Architects and Surveyors,
Office, New York State Institution of Civil Engineers,
STATE HALL, ALBANY, N. Y.

Drawings, specifications and surveys accurately ex-
ecuted. Pupils instructed theoretically and practical-
ly at a moderate premium.

May 26, 1849.

Eaton, Gilbert & Co.,
Railroad Car, Coach and Omnibus Builders,
TROY, N. Y.

Hudson River Foundry,
THOMAS & COLLINS,
130 Quay Street, Albany.

To Railroad & Navigation Cos.

Mr. M. BUTT HEWSON, Civil Engineer, offers his
services to Companies about to carry out the surveys
or works of a line of Navigation or Railroad. He can
give satisfactory references in New York City as to his
professional qualifications; and will therefore merely
refer here to the fact of his having been engaged for
upwards of two years conducting important Public
Works for the British Government.

Communications will find Mr. Hewson at the office
of the Railroad Journal, 54 Wall Street, New York.

Walter R. Johnson,
CIVIL AND MINING ENGINEER AND AT-
torney for Patents. Office and Laboratory, F St.,
opposite the Patent office, Washington, D. C.

Cop Waste.

CLEAN COP WASTE, suitable for cleaning Rail-
road, Steam boat and Stationary Engines, con-
stantly on hand and for sale by

KENNEDY & GELSTON,
54 Pine St., New York.

October 27, 1849,

IRON.

Iron.

Pig Iron, Anthracite and Charcoal; Boiler and Flue
Iron, Spring and Blistered Steel, Nail Rods, Best Re-
finer Bar Iron, Railroad Iron, Car Axles, Nails, Stove
Castings, Cast Iron Pipes of all sizes, Railway Chairs
of approved patterns for sale by

COLEMAN, KELTON & CABELL,
109 N. Water St., Philadelphia.

IRONDALE PIG METAL, MANUFACTURED
and for sale by the Bloomsburg Railroad Iron Co.
DUDLEY FISHER, Treasurer.
75 N. Water St., Philadelphia.

Railroad Iron.

500 Tons, afloat, weighing 57 pounds per lineal
yard, for sale by

COLLINS, VOSE & CO.,
158 South St.

New York, November 17, 1849.

Railroad Iron.

THE Undersigned, Agents for Manufacturers, are
prepared to contract to deliver Rails of superior
quality, and of any size or pattern, to any ports of dis-
charge in the United States.

COLLINS, VOSE & CO.,
158 South St.

New York, November 17, 1849.

Railroad Iron.

1675 Tons, weighing about 61 lbs. per yard, 90
tons, weighing about 52 lbs. per yard, and
825 tons, weighing about 53½ lbs. per yard, of the lat-
est and most approved patterns of T rail, for sale by

BOORMAN, JOHNSTON & CO.,
119 Greenwich street.

New York, Feb. 25, 1850.

N.B.—B. J. & Co are also prepared to take con-
tracts for English rails, delivered in any of the Atlan-
tic ports of the United States.

Railroad Iron.

THE UNDERSIGNED, HAVING made arrange-
ments abroad, are prepared to contract for the de-
livery of Foreign rails, of approved brands upon the
most favorable terms.

They will also make contracts for American rails,
made at their Trenton works, from Andover Iron, in
whole or in part, as may be agreed upon.

They are prepared to furnish Telegraph, Spring and
Market Wire; Braziers and Wire Rods; Rivets and
Merchant Bars to order, all made exclusively from An-
dover Iron. The attention of parties who require iron
of the very best quality for special purposes, is respect-
fully invited.

COOPER & HEWITT,
17 Burling Slip, New York

February 15, 1850.

Glendon Refined Iron.

Round Iron, Band Iron, Hoop Iron,
Square " Flat " Scroll "

Axles, Locomotive Tyres,

Manufactured at the Glendon Mills, East Boston, for
sale by **GEORGE GARDNER & CO.,**

5 Liberty Square, Boston, Mass.

Sept. 15, 1849.

3m37

**PATENT HAMMERED RAILROAD, SHIP &
BOAT SPIKES.**—The Albany Iron Works
have always on hand, of their own manufacture, a
large assortment of Railroad, Ship and Boat Spikes
from 2 to 12 inches in length, and of any form of head.
From the excellence of the material always used in
their manufacture, and their very general use for rail-
roads and other purposes in this country, the manu-
facturers have no hesitation in warranting them fully
equal to the best spikes in market, both as to quality
and appearance. All orders addressed to the subscrib-
ers at the works will be promptly executed.

JOHN F. WINSLOW, Agent.

Albany Iron and Nail Works, Troy, N. Y.
The above Spikes may be had at first prices, of
Erastus Corning & Co Albany; Merritt & Co., New
York; E. Pratt & Br 1 Co., Es. 2nd St. Md

**LAP—WELDED
WROUGHT IRON TUBES**

TUBULAR BOILERS,
FROM 1 1-2 TO 8 INCHES DIAMETER.

These are the ONLY Tubes of the same quality
and manufacture as those so extensively used in
England, Scotland, France and Germany, for Lo-
comotive, Marine and other Steam Engine Boilers

THOMAS PROSSER,

Patentee.

28 Platt street, New York

Railroad Iron.

THE UNDERSIGNED ARE PREPARED TO
contract for the delivery of English Railroad Iron
of favorite brands, during the Spring. They also re-
ceive orders for the importation of Pig, Bar, Sheet, etc.
Iron.

THOMAS B. SANDS & CO.,

22 South William street,

February 3, 1849.

New York.

Iron Store.

THE Subscribers, having the selling agency of the
following named Rolling Mills, viz: Norristown,
Rough and Ready, Kensington, Triadelphia, Potts-
grove and Thorndale, can supply Railroad Companies,
Merchants and others, at the wholesale mill prices for
bars of all sizes, sheets cut to order as large as 58 in.
diameter; Railroad Iron, domestic and foreign; Lo-
comotive tire welded to given size; Chairs and Spikes;
Iron for shafting, locomotive and general machine;
purposes; Cast, Shear, Blister and Spring Steel; Bol-
ter rivets; Copper; Pig Iron, etc., etc.

MORRIS, JONES & CO.,

Iron Merchants,

Schuylkill 7th and Market Sts., Philadelphia.
August 16, 1849.

ly33

Railroad Iron.

THE MOUNT SAVAGE IRON WORKS, AL-
legany county, Maryland, having recently pas-
sed into the hands of new proprietors, are now pre-
pared, with increased facilities, to execute orders for any
of the various patterns of Railroad Iron. Communi-
cations addressed to either of the subscribers will have
prompt attention. **J. F. WINSLOW, President**

Troy, N. Y.

ERASTUS CORNING, Albany

WARREN DELANO, Jr., N. Y.

JOHN M. FORBES, Boston.

ENOCH PRATT, Baltimore, Md.

November 6, 1848.

Railroad Iron.

THE SUBSCRIBERS ARE PREPARED TO
take orders for Railroad Iron to be made at their
Phoenix Iron Works, situated on the Schuylkill Riv-
er, near this city, and at their Safe Harbor Iron Works,
situated in Lancaster County, on the Susquehanna
river; which two establishments are now turning out
upwards of 1800 tons of finished rails per month.

Companies desirous of contracting will be promptly
supplied with rails of any required pattern, and of the
very best quality.

REEVES, BUCK & CO.,

45 North Water St., Philadelphia.

March 15, 1849.

Monument Foundry.

A. & W. DENMEAD & SON,
Corner of North and Monument Sts.,—Baltimore,
HAVING THEIR

IRON FOUNDRY AND MACHINE SHOP

In complete operation, are prepared to execute faithfully and promptly, orders for Locomotive or Stationary Steam Engines, Woolen, Cotton, Flour, Rice, Sugar Grist, or Saw Mills, Slide, Hand or Chuck Lathes, Machinery for cutting all kinds of Gearing, Hydraulic, Tobacco and other Presses, Car and Locomotive patent Ring Wheels, warranted,

Bridge and Mill Castings of every description, Gas and Water Pipes of all sizes, warranted, Railroad Wheels with best faggotted axle, furnished and fitted up for use, complete

Being provided with Heavy Lathes for Boring and Turning Screws, Cylinders, etc., we can furnish them of any pitch, length or pattern.

Old Machinery Renewed or Repaired—and Estimates for Work in any part of the United States furnished at short notice.

June 8, 1849.

Iron Wire.

REFINED IRON WIRE OF ALL KINDS,
Card, Reed, Cotton-flyer, Annealed, Broom, Buckle, and Spring Wire. Also all kinds of Round, Flat or Oval Wire, best adapted to various machine purposes, annealed and tempered, straightened and cut any length, manufactured and sold by

ICHABOD WASHBURN.

Worcester, Mass., May 25, 1849.

American and Foreign Iron.

FOR SALE,

300 Tons A 1, Iron Dale Foundry Iron.
100 " 1, " " "
100 " 2, " " "
100 " " Forge " "
400 " Wilkesbarre " "
100 " "Roaring Run" Foundry Iron.
300 " Fort " "
50 " Catoctin " "
250 " Chikiswalungo " "
50 " "Columbia" "chilling" iron, a very superior article for car wheels.
75 " "Columbia" refined boiler blooms.
30 " 1 x 1/2 Split iron.
50 " Best Penna. boiler iron.
50 " "Puddled" " "
50 " Bagnall & Sons refined bar iron.
50 " Common bar iron.

Locomotive and other boiler iron furnished to order.

GOODHUE & CO.,

New York. 64 South street

American Pig, Bloom and Boiler Iron.

HENRY THOMPSON & SON,
No 57 South Gay St., Baltimore, Md.
Offer for sale Hot Blast Charcoal Pig Iron made at the Catoctin (Maryland), and Taylor (Virginia), Furnaces; Cold Blast Charcoal Pig Iron from the Cloverdale and Catauba, Va. Furnaces, suitable for Wheels or Machinery requiring extra strength; also Boiler and Fine Iron from the mills of Edge & Hilles in Delaware, and best quality Boiler Blooms made from Cold Blast Pig Iron at the Shenandoah Works, Va. The productions of the above establishments can always be had at the lowest market price for approved paper.

American Pig Iron of other brands, and Rolled and Hammered Bar Iron furnished at lowest prices. Agents for Watson's Perth Amboy Fire Bricks, and Rich & Cos. New York Salamander Iron Chests.

Baltimore, June 14, 1849. 6 mos

Wheel, Forge and Foundry Iron.

LOCUST GROVE Wheel Iron of great strength and superior chilling property.
Balt. Charcoal Forge Iron, from Patuxent, Curtis Creek and Gunpowder furnaces.

Elkridge Foundry Iron, of superior strength and softness. Anthracite and Charcoal Iron from Pennsylvania and Virginia. Gas and Water Pipes, Lamp Posts from Elkridge furnace.

LEMMON & GLENN,
62 Buchanan's Wharf, Baltimore.

Iron.

THE SUBSCRIBERS having resumed the agency of the New-Jersey Iron Company, are prepared to execute orders for the different kinds and sizes of Iron usually made at the works of the company, and offer for sale on advantageous terms.—

150 tons No. 1 Bonton Foundry Pig Iron.
100 " No. 2 do. do. do.
300 " Nos. 2 & 3 Forge do. do.
100 " No. 2 Glendon do. do.
140 " Nos. 2 & 3 Lehigh Crane do do.
100 " No. 1 Pompton Charcoal do.
100 " New-Jersey Blooms
50 " New-Jersey Faggotted Iron, for shafts
Best Bars, 1 to 4 inch by 1 to 1 inch thick.
Do do Rounds and Squares, 1 to 3 inch.
Rounds and Squares, 3-16 to 1 inch.
Half Rounds, 1 to 1 in. Ovals & Half Ovals 1 to 1 1/2 in.
Bands, 1 1/2 to 4 inch. Hoops, 1 to 2 inch.
Trunk Hoops, 1 to 1 1/2 in. Horse Shoes & Nut Iron.
Nail Plates. Railroad Spikes.

DUDLEY B. FULLER & Co., 139 Greenwich-st. and 85 Broad-st.

WILLIAM JESSOP & SONS' CELEBRATED CAST-STEEL

The subscribers have on hand, and are constantly receiving from their manufactory,

PARK WORKS, SHEFFIELD,

Double Refined Cast Steel—square, flat and octagon. Best warranted Cast Steel—square, flat and octagon. Best double and single Shear Steel—warranted. Machinery Steel—round.

Best and 2d gy. Sheet Steel—for saws and other purposes.

German Steel—flat and square, "W. I. & S." "Eagle" and "Goat" stamps.

Genuine "Sykes," L Blister Steel.

Best English Blister Steel, etc., etc., etc.

All of which are offered for sale on the most favorable terms by

WM. JESSOP & SONS,

91 John street, New York.

Also by their Agents—
Curtis & Hand, 47 Commerce street, Philadelphia.
Alex'r Fullerton & Co., 119 Milk street, Boston.

Stickney & Beatty, South Charles street, Baltimore.
May 6, 1848.

Ogden & Martin's ROSENDALE CEMENT.

WE are prepared to enter into arrangements for supplying our Cement for public works or other purposes. We warrant the cement equal in every respect to any manufactured in this country. It attains a great degree of hardness, sets immediately under water, and is a superior article for masonry coming in contact with water, or requiring great strength.

For sale in tight barrels, well papered, at their office by
OGDEN & MARTIN, 104 Wall st.
February 16, 1850. ly*

The above cement is used in most of the fortifications building by government.

JOHNSON, CAMMELL & Co's Celebrated Cast Steel,

AND
ENGINEERING AND MACHINE FILES,
which for quality and adaptation to mechanical uses, have been proved superior to any in the United States. Every description of square, octagon, flat and round cast steel, sheet, shovel and railway spring steel, best double and single shear steel, German steel, flat and square, goat stamps, etc. Saw and file steel, and steel to order for any purposes, manufactured at their Cyclops Steel Works Sheffield.

JOHNSON, CAMMELL & CO.,
100 William St., New York.

November 23 1849.

Railroad Iron.

1,500 Tons weighing 53 lbs. per lineal yard.
500 " " 57 " " "
500 " " 56 " " "
500 " " 60 & 61 lbs. " "

Also 2 1/2 x 1/2 flat rails. All the above being of approved patterns. For sale by

DAVIS, BROOKS, & CO.,
68 Broad street.

N.B.—Rails imported on commission, or at a fixed price.

Railroad Iron.

CONTRACTS for Railroad Iron of any pattern or weight and of a favorite brand, delivered at any port of the U. S., made on favorable terms by

CHARLES ILLIUS,
20 Beaver St., New York.

American Cast Steel.

THE ADIRONDAC STEEL MANUFACTURING CO. is now producing from American iron, at their works at Jersey City, N.J., Cast Steel of extraordinary quality, and is prepared to supply orders for the same at prices below that of the imported article of like quality. Consumers will find it to their interest to give this a trial. Orders for all sizes of hammered cast steel, directed as above, will meet with prompt attention.

May 28, 1849.

To Steam Engine Builders.

THE undersigned offer for sale, at less than half the cost, the following new machinery, calculated for an engine of 62 inches cylinder and 10 feet stroke, viz.

- 2 Wrought Iron Cranks, 60 inches from centre to centre.
- 1 Do. do. Connecting Rod Strap.
- 2 Do. do. Crank Pins.
- 1 Eccentric Strap.
- 1 Diagonal Link with Brasses.
- 1 Cast Iron Lever Beam (forked).

The above machinery was made at the West Point Foundry for the U. S. Steamer Missouri, without regard to expense, is all finished complete for putting together, and has never been used. Drawings of the cranks can be seen on application to

HENRY THOMPSON & SON,

No. 57 South Gay St., Baltimore, Md.

Sept. 12, 1849.

Railroad Instruments.

THEODOLITES, TRANSIT COMPASSES, and Levels, with Fractions, Minich Glasses, Surveyor's Compasses, Chains, Drawing Instruments, Barometers, etc., all of the best quality and workmanship, for sale at unusually low prices, by

E. & G. W. BLUNT,

No. 179 Water St., cor. Burling Slip.

New York, May 19, 1849.

Ballard's Improved JACK-SCREW.

PATENTED.

THE ADVANTAGES OF THIS Screw for Stone Quarries, Railroads, Steam Boiler Builders, and for other purposes are superior to any other similar machine.

The improvement consists in being able to use either end of the screw, as occasion requires.

It is capable of raising the heaviest Locomotive with ease, being portable, strong and powerful, and not likely to get out of order.

Many Railroad Companies and Boiler Makers have them in use—by whom they are highly recommended.

JACK SCREWS,
of various sizes, power and price, constantly on hand at the manufactory.

No. 7 Eldridge Street,
near Division Street.

New York, Jan. 19, 1850.

To Railroad Companies and Contractors.

FOR SALE.—Two Locomotive Engines and Tenders, at present in use on the Beaver Meadow Railroad, being too light for their coal trains, but well calculated for either gravel or light passenger trains.

They weigh, in running order, about 8 tons each, having one pair of driving wheels 4 feet diameter, 4 truck wheels 30 inches diameter, with cylinders 10 inches diameter, and 18 inches stroke of piston. Tenders 4 wheels. Address **JAMES ROWLAND,**

Pres't. Beaver Meadow Railroad & Coal Co.,

Philadelphia.

or, **L. CHAMBERLAIN, Secy,**

at Beaver Meadow, Pa.

May 19, 1849.

SPRING STEEL FOR LOCOMOTIVES, TENDERS AND CARS.—The subscriber is engaged in manufacturing spring steel from 1 1/2 to 6 inches in width, and of any thickness required: large quantities are yearly furnished for railroad purposes, and wherever used its quality has been approved. The establishment being large, can execute orders with great promptitude, at reasonable prices, and the quality warranted. Address **J. F. WINSLOW,**

Albany Iron and Nail Works.

To Railroad Companies.

FOR SALE—A Second-hand Locomotive Engine and Tender, of about 10 tons weight, in good order, and warranted to perform well. Any company wanting a cheap engine for a passenger or light burden train, will rarely meet with an opportunity so favorable as the present. The engine and tender are in perfect running order, and will be tested to the satisfaction of any one wishing to purchase. Price \$1,500.

Address **J. B. MOORHEAD,**
Frazer P.O., Chester county, Pa.

P.S.—The Engine can be seen by calling on H. Osmond & Co., Car-builders, Broad st., Philadelphia. September 6, 1849.

India-rubber for Railroad Cos.

RUBBER SPRINGS—Bearing and Buffer—Fuller's Patent—Hose from 1 to 12 inches diameter. Suction Hose. Steam Packing—from 1-16 to 2 in. thick. Rubber and Gutta Percha Bands. These articles are all warranted to give satisfaction, made under Tyer & Helm's patent, issued January, 1849.—No lead used in the composition. Will stand much higher heat than that called "Goodyear's," and is in all respects better than any in use. Proprietors of railroads do not be overcharged by pretenders.

HORACE H. DAY,

Warehouse 23 Courtlandt street.

New York, May 21, 1849.

Fire Brick.

THE Subscribers have constantly on hand Rafford's Stourbridge, Oak Farms Stourbridge, Lister, Wortley, Red and White Welsh Fire Bricks, common and fancy shapes. Also,

ROOFING SLATES,

from the best Welch quarries, and of all sizes. Also,

COAL,

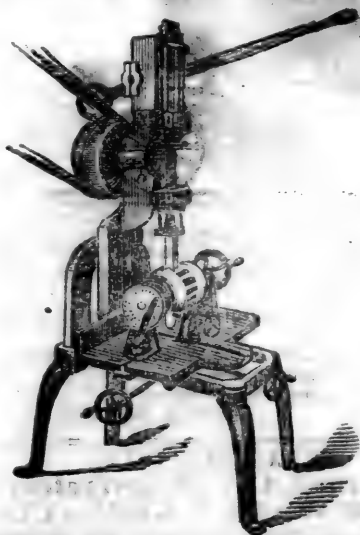
of all kinds—Liverpool Orrell and Cannel, Scotch, New Castle, Pictou, Sidney, Cumberland, Virginia, and all kinds of Anthracite coals. Also,

Pig Iron, Salt, etc., etc., for sale at the lowest market price. Apply to

SAMUEL THOMPSON & NEPHEW,
275 Pearl and 43 Gold Sts., New York.

November, 23, 1849.

**Capt. Alfred Swingle's
PATENT BORING
& MORTISING MACHINE.**



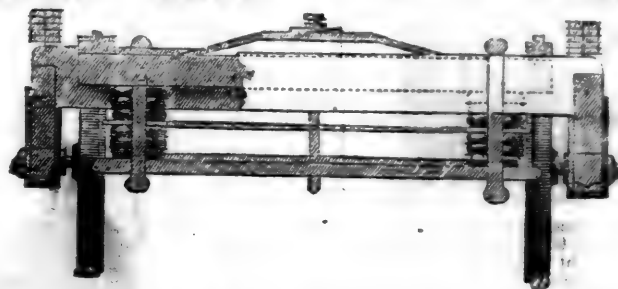
The above Machine was invented by A. SWINGLE, of Texas, in 1846, and Letters Patent were taken out in July, 1848. As a labor saving Machine it stands unrivalled even in these days of improvements. Its uses are innumerable; it may be successfully applied to Doors, Sashes, Carriages, Wheel-Hubs, and in fact to all kinds of work where the Auger and Chisel can be brought to bear.

The only limit to the speed of the working of this machine is the heating of the tools used. It will perform at least the labor of twelve men, and in vastly better manner, and can be worked equally well by steam power or by hand. It has been used and has given universal satisfaction.

For further information apply to H. B. THOMPSON, 40 Wall St., New York, to whom all orders are to be addressed.

New York, December 15, 1849.

**FULLER'S PATENT
INDIA RUBBER CAR SPRINGS.**



RAILROAD COMPANIES are cautioned, before purchasing Springs, to examine the actual patents and judge for themselves.

Persons, under the Title of the New England Car Company, seeking fraudulently to invade Fuller's rights have put forth so many statements for the purpose of misleading the public, that an enumeration of some facts is absolutely necessary, for the purpose of putting persons interested upon their guard.

Fuller's patent is for the application of Discs of India-rubber with Metal Plates, for forming Springs for Railway Cars and Carriages—either one disc and two plates, or ten discs and plates, or any other number, are equally covered by the patent. Fuller is not bound to the use of short discs—he may use long discs and plates.

Ray's patent is simply and wholly the forming of air-tight rubber cylinders, with hoops or bands round the outside, and the combination of elasticity of India rubber, with the elasticity of atmospheric air confined in the cylinder, and in no part of his patent is he authorized to use the form of spring which he is now fraudulently supplying to Railroad Companies. Such springs are direct and positive infringements of the very letter of Fuller's patent.

Fuller's patent is dated October, 1845, Ray's patent, August, 1848.

The spring patented by Ray never has been put in operation, and never can be made useful for Railroad cars.

A mere experiment, even if made, it is well known does not prove an invention; and it is ridiculous for such parties to hope to mislead the Presidents and Superintendents of Railroad companies, by claiming the invention because Ray alleged he made an experiment—which Fuller had made before him—had actually brought into working order, and obtained a patent for—and this too before Mr. Ray states he made his experiment—and that experiment not claimed to have been applied to a car or carriage.

Besides, the invention could not have been developed until India rubber, properly Vulcanised, could be made of a sufficient thickness. In the United States the art of vulcanising rubber by steam heat, (by which

means only can a body of rubber having any considerable thickness be vulcanised,) was not introduced until after the grant by the American government of the patent for springs to Fuller—whereas the process of vulcanising rubber by steam heat was invented in England about three years previously, and was used by Fuller there. This fact refutes entirely the claim of invention put forth by Mr. Ray, and proves the impossibility of his pretensions being true.

Fuller was the first and only inventor of the spring. A Mr. Dorr, whose connection with Mr. Goodyear is well known in this country, applied in England to Mr. Fuller, after he had published and patented his invention, and introduced another party for the purpose of obtaining the agency for the United States. They were furnished with a complete set of drawings and models, and with instructions to make arrangements for the supply of material of American manufacture—from that hour to the present not a single communication has been received from them. Some of these identical models have been traced into the hands of parties now seeking to invade Fuller's rights, and who have exhibited them as specimens of their own invention.

After this, the conveyance was made by Goodyear to certain parties here for the use for railroad springs of what he calls his Metallic rubber. Comment is unnecessary.

There are 5 or 6 different processes for the manufacture of vulcanised rubber, patented by as many different parties, some here, some in England, either of which would probably make good springs.

A large and powerful company has been organized under Fuller's patent, the particulars of which shall be given very shortly.

An action has been commenced against three railroad companies for infringement; and all other parties will assuredly be prosecuted if they continue further to infringe upon Fuller's patent.

W. C. FULLER,

The only persons authorised to supply the Springs are **G. M. KNEVITT**, 38 Broadway, N. York, General Agent for the U. S.; and **JAS. LEE & Co.**, 18 India Wharf, Boston. **JOHN THORNLEY**, Chestnut st., Philad.

**Patent India Rubber Steam
Packing.**

THIS article, made by the subscriber, who alone is authorised to make it, is warranted to stand as high a degree of heat as any that has been or can be made by any person—and is the article which has made the reputation of India Rubber Steam Packing and the demand therefor. A large assortment of all thicknesses requisite for any description of engines, steam pipes, valves, etc., constantly on hand and for sale by the manufacturer and patentee, who will give every information regarding its properties, mode of use, etc. at the warehouse. **JOHN GREACHEN, JR.**, 98 Broadway, opposite Trinity Church. New York, October, 1849.

**Ibbotson, Brothers & Co's
CELEBRATED CAST STEEL
AND**

Best Cast Steel Royal Improved Files, well known as better adapted for Engineers' and Machinists' purposes than any now in use in the United States.

Every description of Square, Octagon, Flat and Round Cast Steel, Sheet, Shovel and Railway Spring Steel, etc., and Steel to order for any purpose—manufactured at their works in Sheffield—and universally known by the old stamp "Globe."

HENRY J. IBBOTSON, Agent,
218 Pearl st., New York.

February 25, 1850.

FAIRBANKS' RAILROAD SCALES.—THE subscribers are prepared to construct at short notice, Railroad and Depot Scales, of any desired length and capacity. Their long experience as manufacturers—their improvements in the construction of the various modifications, having reference to strength, durability, retention of adjustment, accuracy of weight and dispatch in weighing—and the long and severe tests to which their scales have been subjected—combine to ensure for these scales the universal confidence of the public.

No other scales are so extensively used upon railroads, either in the United States or Great Britain;—and the managers refer with confidence to the following in the United States.

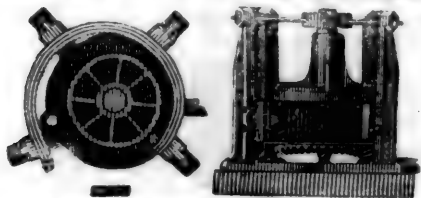
Eastern Railroad.	Boston & Maine Railroad.
Providence Railroad.	Providence and Wor. Road.
Western Railroad.	Coneord Railroad.
Old Colony Railroad.	Fitchburg Railroad.
Schenectady Railroad.	Syracuse and Utica Road.
Balt. and Ohio Railroad.	Baltimore and Susq. Road.
Phila. & Reading Road.	Schuylkill Valley Road.
Central (Ga.) Railroad.	Macon and Western Road.
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And other principal Railroads in the Western, Middle and Southern States.

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April 22, 1849.

MACHINERY.**Henry Burden's Patent Revolving Shingling Machine.**

THE Subscriber having recently purchased the right of this machine for the United States, now offers to make transfers of the right to run said machine, or sell to those who may be desirous to purchase the right for one or more of the States.

This machine is now in successful operation in ten or twelve iron works in and about the vicinity of Pittsburgh, also at Phoenixville and Reading, Pa., Covington Iron Works, Md., Troy Rolling Mills, and Troy Iron and Nail Factory, Troy, N. Y., where it has given universal satisfaction.

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Railroad Spikes and Wrought Iron Fastenings.

THE TROY IRON AND NAIL FACTORY, exclusive owner of all Henry Burden's Patented Machinery for making Spikes, have facilities for manufacturing large quantities upon short notice, and of a quality unsurpassed.

Wrought Iron Chairs, Clamps, Keys and Bolts for Railroad fastenings, also made to order. A full assortment of Ship and Boat Spikes always on hand.

All orders addressed to the Agent at the Factory will receive immediate attention.

P. A. BURDEN, Agent,
Troy Iron and Nail Factory, Troy, N. Y.

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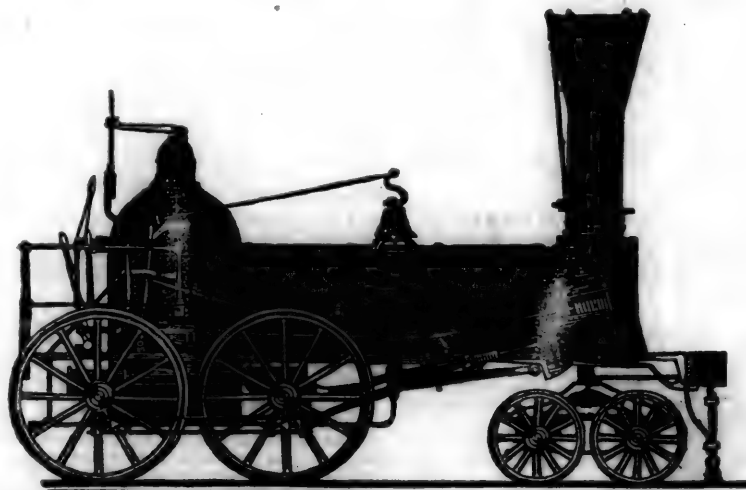
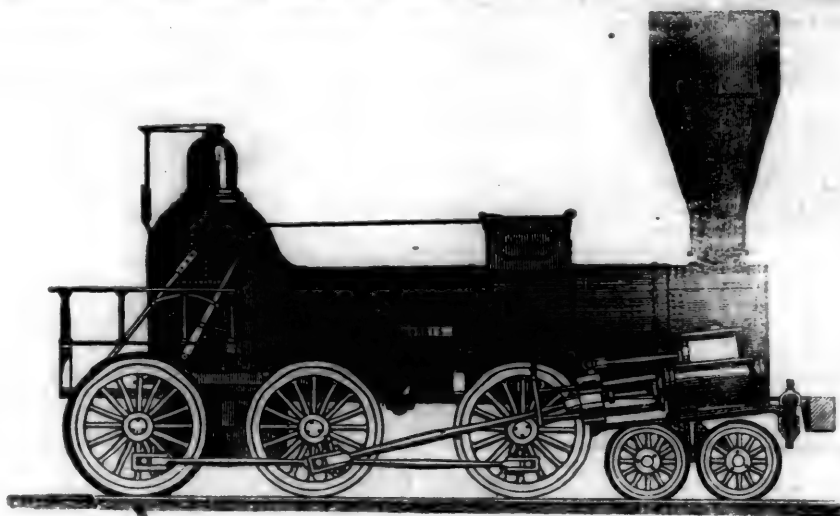
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March 12, 1842.

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P. A. BURDEN, Agent,
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Railroad Car Manufactory.
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HAVE established at this central point, the manufacture of Passenger, Freight, Gravel and Hand Cars for Railroads, and assure all Western Railroad Companies that it will be their constant aim to procure the best materials and workmen, and to turn out the best kind of work at fair prices. Specimens may be seen on the Columbus and Xenia Railroad. The patronage of Railroad Companies is respectfully solicited. 1y8

To Inventors and Patentees.

OWEN G. WARREN, ARCHITECT, Has had many years' experience as Agent for obtaining Patents, both in this country and Europe, and will transact such business promptly and reasonably. Persons at a distance can have their business done by correspondence—without the necessity of visiting this city or Washington. Office No. 94 Merchants Exchange, Wall st., corner of Hanover st., up stairs. 1y3

AMERICAN RAILROAD JOURNAL.

STEAM NAVIGATION, COMMERCE, MINING, MANUFACTURES.

HENRY V. POOR, Editor.

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American Railroad Journal.

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Saturday, March 16, 1850.

The Coal Trade of London.

Continued from page 147.

As the meters' establishment of London was abolished in 1831, the coal owners, factors and merchants, have agreed among themselves on a system of weighing, to ensure accuracy of dealings. A committee of owners and merchants (or sellers and buyers) manages the system and pays for the services of a large number of weighers; the buyer and seller sharing the expense between them. In 1830 the expenses incurred by the merchant, from the time he bought a ship load of coals to the deposition of the coal in the cellar of the consumer, amounted on an average to as much as 11s. per ton—comprising commission, lirage, cartage, shootage, metage, market dues, land metage, and other items. By the year 1836, these expenses had been reduced to 7s.; and at the present time they must be considerably lower. The coal owners and merchants have nothing to do with each other under ordinary circumstances, although they are the real

sellers and buyers; the factor acts for both: the merchant is responsible only to the factor, and the factor to the owner. Excepting in the case of very large purchases, for gas works, breweries, and other extensive establishments, all the coal used in London passes through the hands of the merchants—who, for the most part, have their own barges, wharfs, wagons and horses.

The actual discharge of the coals from the ships to the barges drawn up alongside, is a distinct system from all the other arrangements. The corporation, the coal factors, the coal merchants—none of these are concerned in the matter. The shipowner acting for the coal owner, or for the party who pays the freight of the vessel, hires and pays for the services of the men who make the transfer of the coals. For some reason or other, the crews of the coal ships seldom perform this duty; they either do not like it, or they are not equal to it, or the captain prefers another plan. The persons employed are coal whippers, strong laboring men, whose services are always available for this work. They work in gangs, usually of nine each; and the agreement is always so much per ton for the whole gang. The terms are usually about a penny per ton per man. The coal merchant who has bought the cargo, sends his barges to the side of the ship; and the gang of coal whippers work on until they have emptied the cargo into the barges. Some of them descend into the hold, and fill the baskets or boxes with coals, and others draw up the laden baskets by means of ropes and pulleys, and empty the contents into the barges. The work is the coarsest and rudest kind of manual labor. Nine men can whip about 80 or 90 tons in a day. The men can often earn a shilling an hour each while at work; but the number of hours' work obtainable in a week is subject to much fluctuation. It seems plain, however, that the earnings are decidedly above those of laboring men generally. There are from 1,600 to 2,000 men thus employed in the Thames; and they have often found means to make the position of interlopers into their trade anything but agreeable.

Until within a few years, these strong and hardy men suffered themselves to be duped in an extraordinary way by publicans and petty shop keepers on shore. The custom was for the captain of a coal ship, when he required a cargo to be whipped, to apply to one of the publicans for a gang; and a gang was thereupon sent from the public house.

There was no profession or pre-arranged deduction from the price paid for the work; the captain paid the publican, and the publican paid the coal whippers; but the middleman had his profit in another way. The coal whipper was expected to come to the public house in the morning; to drink while waiting for work; to take drink with him to the ship; to drink again when the day's work was done; and to linger about and in the public house until almost bed time before his day's wages were paid. The consequence was, that an enormous ratio of his earnings went every day to the publican. The publicans were wont to rank their dependents into two classes—the "constant men" and the "stragglers;" of whom the former were first served whenever a cargo was to be whipped; in return for this, they were expected to spend almost the whole of their spare time in the public house, and even to take up their lodgings there. As the coal whippers contrived by intimidation to keep out strangers from their trade, so the publicans and their immediate adherents were able to harass those who wished to escape from this truck system; and the "penny-a-ton men" used to receive many a drubbing from the "penny-farthing" men. The captains preferred applying to the publicans rather than engaging the men themselves, because it saved them trouble; and because, as was pretty well understood, the publicans carried favor with them by indirect means. Grocers and small shopkeepers did the same; and the coal whippers had then to buy bad and dear groceries instead of bad and dear beer and gin. The legislature tried by various means to protect the coal whippers; but the publicans contrived means to evade the law.—About 1834 Lieut. Arnold tried how far an individual could remedy the system, by establishing a coal whippers' office, in which the men could receive the whole of their earnings, without the necessity of such constant resort to a public house; his attempt was a benevolent one, but it was hotly opposed by the publicans, and was not supported to any great degree by the coal owners and shippers. At length was passed, in 1843, an act of which an abstract is given in a previous volume, and which has placed the coal whippers in a more systematised position. The whole is a remarkable instance of what small matters (as they often appear) the legislature will sometimes interest itself in.

When the coal whippers have dischar

cargo from the ships to the barges, the coal owner, ship owner, Corporation, factor, coal whipper—all have done their part. The merchant is then the only party concerned. He has, if in a large way of business, his own barges, wharfs, wagons, horses, sacks, weighing machines, screens, and everything requisite for transferring the coals to the cellar of the consumer. If he is in a smaller way, he probably buys from the larger merchant. There are nearly 1000 persons in London who sell coals: from the merchants whose establishments are of great magnitude, to the small shopkeeper who sells a pennyworth either of coals or of green grocery. The price of coals, as given in the London market in the daily papers, is the price up to the time when the coals are whipped from the ships to the merchants' barges. It includes, 1st, the value of the coals at the pit's mouth; 2d, the expense of transit from the pit to the ship; 3d, the freight of the ship to London; 4th, the Thames dues, and 5th, the whipping. The difference between the market price and the price paid by consumers, is made up of the expense incurred by the coal merchant for barges, wharfs, wagons, horses, wages, etc., together with his profit and risk.

There is still one matter more to complete the chain of operations. The emptied coal ships must get back to Newcastle; and as there are not cargoes enough from London to freight them, they must take in ballast to make the ships heavy enough to sail in safety. This ballast is chiefly gravel or sand, dredged up from the bed of the Thames in and near Woolwich Reach. The Trinity House takes upon itself this duty. The captain when he requires to sail, applies to the ballast office and the required weight of ballast is sent to the ship in lighters belonging to the Trinity House; the captain paying so much per ton for it. About eighty tons on an average are required for each vessel; and the quantity thus supplied by the Trinity House is, we believe, about 10,000 tons per week. Some of the ships are ballasted with chalk taken from Purfleet; all ballast taken from higher up the river than that point, must be supplied by the Trinity House. When the ship reaches the Tyne, the ballast is of no further use: but it must not be emptied into that river; it has therefore to be deposited on the banks of the river, where huge mounds are now collected, two or three hundred feet high. It is a curious example of the mode in which commercial enterprises often originate, that parties have found it worth their while to make a railway from near South Shields to a point on the sea shore, a mile or two distant, on purpose to deposit there the ballast which has become more and more an incumbrance on the banks of the river; the ship owners pay a small price per ton for the removal of the ballast from their vessels. It is something more than a metaphor, to designate this a transfer of the bed of the Thames to the banks of the Tyne; it has a per centage of truth in it.

Thus we find, that about 12,000 persons are engaged in mining and shipping coals for London; 22,000 in navigating the coal ships from the North to the Thames; 2,000 in "whipping" the coal from the ships to the merchants' barges; and 1,000 in selling the coals to the consumers in London. How many are engaged as coal bargemen upon the Thames and upon the canals, coal heavers at the wharfs, and coal wagoners in the streets, we have no data for determining.

Pennsylvania Canal.

Two canal boats, full laden with merchandise for Pittsburgh, left Columbia, Pa., on the 5th, by

the way of the Pennsylvania canals. These are the first boats of the season.

We give place to the following, copied from the Savannah Republican, knowing it to come from the hands of a practical engineer whose opinion is entitled to respect. The improvement of Mr. Remington, it seems, consists simply in substituting wood for iron in what is termed the suspension bridge.

There can be no objection to wood on account of its not possessing sufficient strength when subjected to a longitudinal strain or tension. Its adaptability to this purpose must depend upon its durability when exposed to the action of the weather, and to the jar and vibration caused by the travel over it. This must be determined by experiment, and we are glad to learn that such an experiment Mr. Remington is now engaged in making:

To the Editors of the Savannah Republican:

GENTLEMEN—In passing through Montgomery Alabama, a few days since, I accidentally witnessed an experiment there going forward with a model of a bridge constructed upon the "Remington patent."

I was much struck with the practical workings of the bridge, and knowing your willingness to publish anything that will tend to the good of the public, and also deeming it but an act of justice to Mr. Remington and his bridge, I have taken the liberty of laying before the public, through the columns of your valuable paper, a hasty statement of it and its merits.

The experiment I witnessed, consisted of the testing of a model bridge of 60 feet span. The bridge was constructed entirely of timber, and consisted of 3 longitudinal stringers, or supporters each 60 feet long and one inch square at the centre, firmly fastened at each end, to an abutment, also of timber, which was screwed fast to the floor. Upon these three stringers were laid pieces of plank sufficient to pile the testing weights upon, and there was then placed upon the bridge, the enormous weight of 29,600 pounds, or nearly 15 tons, when one of the abutments, from being imperfectly fastened, gave way. Had the abutments been properly fastened, I have not the least doubt but the stringers were capable of sustaining at least 50 per cent. more weight. The experiment, however, was perfectly satisfactory, and convinced the most sceptical of those who witnessed it, of the great value and importance of Mr. Remington's plan.

I have, for many years, been engaged upon public works, and have constructed many bridges upon various plans, yet I have no hesitation in stating that the Remington bridge far supercedes all other bridges—in its capacity of long spans—in its great strength—in its ready adaptation to any locality—and what is of great importance, in the cheapness of its first cost, as also in the cost of repairs, &c.

Mr. Remington is now busily engaged in constructing a bridge at Montgomery—of 400 feet span—across a deep ravine; to be used for the passage of trains of cars, and also for heavy loaded teams.

The bridge will be constructed entirely of planks, and will form, when completed, a perfect floor or body of plank 12 feet wide, 5 inches thick at the abutments, and 3 inches thick at the centre. [The object of using so much timber, as I was informed, is to demonstrate its practicability for railway use; at the same time it is cheaper than to strip it into separate stringers.]

The plank for 133 feet in the distance—in the centre—are only three inches thick, as they taper from the abutments, where they are 5 inches thick, to a thickness of 3 inches in the first 133 feet. Yet with this slight amount of timber in the middle of a 400 feet span bridge, it will sustain the enormous amount of two thousand one hundred and sixty tons—a weight that appears almost incredible and sufficient to break down any other timber or iron bridge in the Union, be its span great or small.

The great value of the bridge consists in its wonderful strength and cheapness. It can be constructed at a mere fraction of the cost of ordinary bridges; and what appears still more singular, the lon-

ger the span the cheaper the price per running foot. Its cheapness and capability of great spans, render it peculiarly valuable to new countries where money is scarce, but where timber and streams are plenty—and I have no doubt but that it will in a few years entirely supercede all other kinds of bridges, both in new and old settled States, and also for railways and highways.

For ordinary road purposes, four stringers one and a half or two inches square covered with plank, will be sufficient to sustain all the load that will ever be placed upon them—and a bridge of this nature four or five hundred feet span can be constructed at a cost of two or three dollars per foot run.

Mr. Remington, as I was informed, has recently returned from England where he has constructed several of his bridges, for the purpose of constructing this Bridge at Montgomery—in order, as he says, "to demonstrate to the American people [who have heretofore placed no confidence in his statements,] the entire practicability of his bridge"—and it is his intention to return again to England after the completion of the bridge he is now building.

The bridge at Montgomery will be completed in five or six weeks, and will then well repay any person for a visit to it. I have heard an argument urged against Mr. R's plan, that the timber, from the small quantity used, would decay very rapidly, and consequently the bridge would for a short time only, be useful. Mr. R. has, however, invented a preparation, costing but little, by means of which the timber used may be made imperishable. The base of the preparation is molecules of sand, which renders wood covered with it fire proof and impervious to water. The bridges are to be covered with this preparation to the depth of a quarter of an inch on top with the same preparation in the form of a paint below.

R. L. L.

NEW ORLEANS, February 19, 1850.

To the Editor of the Railroad Journal:

Sir—While on a trip down the Ohio river a short time since, my attention was drawn to a very flourishing place, situated in Indiana, 130 miles below Louisville, known as Cannellton. The evident signs of improvement, and numerous buildings in all stages of erections, and of all sizes, from an immense large cut-stone one to the modest two story cottage, induced me to stop a day or two and see what was going forward in this, heretofore considered, out-of-the-way part of the world. Upon looking around, (after I was fairly housed in the hospitable mansion of Hon. E. M. Huntington,) I found that Cannellton was in reality a place that bids fair to be of great importance, not only to Indiana, but to the entire West and South. It is in fact the commencement of a large manufacturing city; and as your paper takes a great interest in such matters, I will trouble you with a slight sketch of its present position and resources.

The locality has been well chosen; and as a site for a manufacturing city, it certainly possesses advantages that are unequalled in the Union, if not in the world.

The great objects to be obtained in a manufacturing city, to wit: "power, cheap and certain," "cheap living," "facilities for transporting men and matter," "proximity to the materials to be manufactured," "nearness to the market to be supplied," "healthy situation," "a good site for buildings," and "a close proximity to the materials to be used in their construction," are fully obtained at Cannellton.

The power consists in the inexhaustible coal bed that outcrops in the rear of the village. This coal is of a superior quality of "Cannel coal," and can be deposited at any point within the village at a cost of not over three cents a bushel, or 84 cents a ton. Almost the entire cost consists in excavating it: as the cars from the mines, when once loaded

will descend with their own gravity, to any point where it may be desirable to deposit it.

The country around Cannelton, both in Kentucky and Indiana, is of a highly fertile character, and provisions of all kinds can be furnished at this place as cheap as at any other point on the Ohio and Mississippi rivers.

It is situated immediately on the bank of the Ohio, and has steam communication with all parts of the Union, at all seasons of the year. It will also shortly be in direct communication with northern Indiana: as a railway is already spoken of to run back into the interior, thereby connecting it with the great chain of railway now being constructed in this State. It is also but a short distance above the mouths of the Cumberland and Tennessee rivers, and but 250 miles from the mouth of the Ohio, and has therefore a short and direct communication, by the Tennessee river, with the cotton fields of northern Alabama, Mississippi and Tennessee; by the Cumberland river it has also a direct communication with the iron of Tennessee.

It has the hemp of Kentucky in close proximity, and has the lead, copper and iron of Missouri within 450 miles.

It has the entire South and West, within easy reach for a market, with low freights; and I will venture to say that the Cannelton cotton can be placed in Philadelphia, or Baltimore, or even in New York, to compete with the eastern manufactures.

It is peculiarly well situated as regards the health of its inhabitants—being entirely out of reach of the overflows of the Ohio, with no low lands in the neighborhood, but with lands on both sides of the river rising to a height of 300 or 400 feet. The climate is generally mild, and of about the same medium temperature as Richmond, Va.

The location of the "future city" is well selected for the purpose of obtaining a good site for buildings—as little if any grading is required.

The building material is at hand in great abundance, and of a superior quality: consisting of a fine grained sandstone of remarkable uniformity of texture. It lays in a single strata 30 feet thick above the coal, and can be quarried at a trifling cost. When first quarried, it readily splits into square blocks of almost any size, and can be worked as easily as wood; yet it soon hardens from exposure to the atmosphere, and becomes as hard as granite, making the best building material I know of. Timber abounds on the hills in the rear of the village. Limestone of a superior quality, and in abundance, is also found overlaying the sandstone. Clay for brick, and beds of fine sharp sand also are found in abundance at the base of the hills, and the wells at the foot of the hills afford pure freestone water in sufficient quantity for all purposes.

As regards its present aspect, it now contains, I should think, about 1500 inhabitants, and numerous buildings are erecting to accommodate the rapidly increasing population.

The "Cannelton cotton mill" is an immense cut stone building, 263 feet long, 65 feet wide, and four stories high. It will contain 10,600 spindles, will give employment to about 400 operatives, and will be in operation in May or June next.

The Indiana cotton mill to contain 2000 spindles is also in progress. There is also a large church, school houses, nearly 200 dwelling houses, several stores and three saw mills. Various branches of trade are also carried on, and last though not least, is a newspaper, called the Economist—one of the best papers published in the West.

A splendid cut stone hotel is also in course of erection, to be done early in the summer, that will cost twelve or fifteen thousand dollars. In short, buildings of all kinds, both stone and wood, are rapidly springing up in all directions.

The company possess here a tract of about 7000 acres of land, 5000 acres of which are underlaid with one or more seams of coal; they however, with a true knowledge of their own interest, grant every facility to a person going there to reside. They will dispose of building lots at a mere nominal value, and give to all purchasers who are actual settlers, the right to use, for building purposes, from the company's lands, timber, stone, clay and sand, free of charge; and also give to parties now settling there, the right to use the coal at a rent of one cent per bushel for 25 years.

The company have also procured from the Indiana Legislature, 12 distinct charters for manufacturing companies to manufacture all kinds of goods; two of which, the "Cannelton cotton mill" and the "Indiana cotton mill" are already taken up.

This place has already attracted the attention of the wealthy and far-seeing men of this part of the Union, and also many men east of the mountains, and the two companies already formed consist, I am informed, of the wealthiest and most intelligent men of the South and West. The whole place, in fact, bears an air of enterprise that is rarely seen in any section of the country; and I have no doubt that in a few years Cannelton will rival if not outstrip the great manufacturing cities of Lowell, Manchester, Lawrence and Pittsburg. As a field for a mechanic, or a company of mechanics, I know of no place in the Union that possesses the same advantages that Cannelton does, and any one interested, or desirous of being interested in manufactures of any sort, will do well to visit Cannelton before settling elsewhere.

R.

RAILROAD ALONG THE SOUTH SHORE OF LAKE ERIE.

The construction of a railroad from Buffalo to Toledo is now occupying the attention of the people along its line, and bids fair to be completed at an early day.

The length of line from Buffalo to Toledo is 288 miles, and is divided into sections, and is under various stages of progress, as follows:

From Buffalo to the Pennsylvania line, 70 miles, an efficient company is organized, a considerable portion of the stock subscribed, the surveys made, the line located, and soon to be put under contract.

From Erie to the Ohio line, 30 miles, the charter failed last year, by the Governor not affixing his signature to the bill, but the company have organized under another charter, and the road is already under contract.

From the Pennsylvania line to Cleveland, 75 miles, a company is organized, and subscriptions are being taken up on the road.

From Cleveland to Sandusky, 55 miles, and from Sandusky to Toledo, 50 miles, the road is under the control of the Mad River and Lake Erie railroad company, and will be completed as soon as the rest of the road is ready, as it will be for their interest to do so, and thus a communication with the roads of the East on the one hand and the Western railroads on the other, will be opened to them.

"The entire Lake shore road is therefore certain of construction within a reasonable time."

Thence, further on, from Toledo and Monroe to Hillsdale, 68 miles, the road is already in operation, and from Hillsdale to Coldwater, 22 miles, the

road is under contract to be finished by Sept. 1st.

From Coldwater to Chicago the distance is 158 miles, making the whole distance from Buffalo to Chicago 538 miles.

Between Laporte and Michigan City the engineers are in the field. From Michigan to the Illinois line the road will be located by April 1st.

From that point to Chicago the road will be constructed under the general law of Illinois.

POWER OF A BUSHEL OF COALS.

It is well known to engineers that there is a virtue in a bushel of coals, properly consumed, to raise seventy millions of pounds weight a foot high. This is actually the average effect of an engine at this moment working at Huel Towan, in Cornwall. Let us pause a moment, and consider what this is equivalent to in matters of practise. The ascent of Mont Blanc, from the valley of Chamouni, is considered, and with justice, as the most toilsome feat that a strong man can execute in two days.—The combustion of two pounds of coal would place him on the summit. The Menai bridge, one of the most stupendous works of art that has been raised by man in modern ages, consists of a mass of iron, not less than four millions of pounds in weight, suspended at a medium height of 170 feet above the sea. The combustion of seven bushels of coal would suffice to raise it to the place where it hangs. The pyramid of Egypt is composed of granite. It is 700 feet in the side of the base, and 500 in perpendicular height, and stands on 11 acres of ground. Its weight is therefore 12,760 millions of pounds, at a medium height of 125 feet; consequently it would be raised by the effort of about 360 chaldrons of coal—a quantity consumed in some foundries in a week. The annual consumption of coal in London is estimated at 1,500,000 chaldrons. The effort of this quantity would suffice to raise a cubical block of marble, 2200 feet in the side, through a space equal to its own height, or to pile one such mountain upon another. The Monte Nuovo, near Pozzoli, which was erupted in a single night by volcanic fire, might have been raised by such an effort, from a depth of 40,000 feet, or about eight miles.—*Working Men's Friend.*

ON THE CONSTRUCTION OF ROADS.

Rapidity, safety, and economy of carriage are the objects of roads. They should therefore be so located and constructed as to enable burdens, of goods and of passengers, to be transported from one place to another, in the least possible time, with the least possible labor, and, consequently, with the least possible expense.

To attain these important ends, a road should fulfil certain conditions, which the nature of the country over which it passes, and other circumstances, may render impossible to unite and reconcile in one combination; but to the union of which we should endeavor to approximate as nearly as possible in forming an actual road upon the model of this ideally perfect one. We will therefore investigate—

WHAT ROADS OUGHT TO BE,

1. As to their direction.
2. As to their slopes.
3. As to their cross-section.
4. As to their surface.
5. As to their cost.

1. WHAT ROADS OUGHT TO BE AS TO THEIR

DIRECTION.

Importance of Straightness.

Every road, other things being equal, should be perfectly straight, so that its length, and therefore the time and labor expended in travelling upon it, should be the least possible; i. e., its alignments,

or direction, departing from one extremity of it, should constantly tend towards the other.

Advantages of Curving.

The importance of making a road as level as possible will be explained in the next section, and as a road can in few cases be at the same time straight and level, these two requirements will often conflict. In such cases, *straightness should always be sacrificed to obtain a level, or to make the road less steep.* This is one of the most important principles to be observed in laying out or improving a road, and is the one most often violated.

A straight road over an uneven and hilly country may, at first view, when merely seen upon the map, be pronounced to be a bad road; for straightness must have been obtained either by submitting to steep slopes in ascending the hills and descending into the valleys, or these natural obstacles must have been overcome by incurring a great and unnecessary expense in making deep cuttings and fillings.

A good road should wind around these hills instead of running over them, and this it may often do without at all increasing its length. For if a hemisphere (such as half a bullet) be placed so as to rest upon its plane base, the halves of great circles which join two opposite points of this base are all equal, whether they pass horizontally or vertically. Or let an egg be laid upon a table, and it will be seen that if a level line be traced upon it from one end to the other, it will be no longer than the line traced between the same points, but passing over the top. Precisely so may the curving road around a hill be often no longer than the straight one over it; for the latter road is straight only with reference to the vertical plane which passes through it, and is curved with reference to a horizontal plane; while the former level road, though curved as to the vertical plane, is straight as to a horizontal one. Both lines thus curve, and we call the latter one straight in preference, only because its vertical curvature is less apparent to our eyes.

The difference in length between a straight road and one which is slightly curved is very small. If a road between two places ten miles apart were made to curve so that the eye could nowhere see farther than a quarter of a mile of it at once, its length would exceed that of a perfectly straight road between the same points by only about one hundred and fifty yards.*

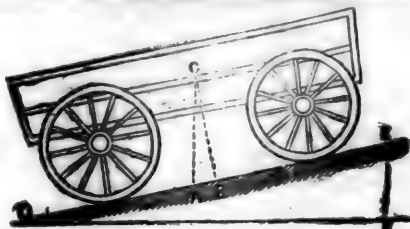
But even if the level and curved road were very much longer than the straight and steep one, it would almost always be better to adopt the former; for on it a horse could safely and rapidly draw his full load, while on the other he could carry only part of his load up the hill, and must diminish his speed in descending it. As a general rule, the horizontal length of a road may be advantageously increased, to avoid an ascent, by at least twenty times the perpendicular height which is to be thus saved; that is, to escape a hill a hundred feet high, it would be proper for the road to make such a circuit as would increase its length two thousand feet.* The mathematical axiom that "a straight line is the shortest distance between two points," is thus seen to be an unsafe guide in road-making, and less appropriate than the paradoxical proverb that "the longest way around is the shortest way home."

2. WHAT ROADS OUGHT TO BE AS TO THEIR SLOPES.

Loss of Power on Inclinations.

Every road should be perfectly level. If it be not, a large portion of the strength of the horses which travel it will be expended in raising the load up in the ascent. When a weight is drawn up an inclined plane, the resistance of the force of gravity, or the weight to be overcome, is such a part of the whole weight, as the height of the plane is of its length. If, then, a road rises one foot in every twenty of its length, a horse drawing up it a load of one ton is compelled to actually lift up one-twentieth of the whole weight, i. e., one hundred pounds, through the whole height of the ascent, besides overcoming the friction of the entire load.

Let DE represent the inclined surface of a road upon which rests a wagon, the centre of gravity of



which is supposed to be at C. Draw CA perpendicular to the horizon, and CB perpendicular to the surface of the hill. Let CA represent the force of gravity, or the weight of the wagon and its load.—It is equivalent, in magnitude and direction, to its two rectangular component forces, CB and BA. CB will then represent the force with which the wagon presses on the surface of the road, and AB the resisting force of gravity, i. e., the force (independent of friction) which resists the ascent of the wagon, or which tends to drag it down hill.

To find the amount of this force, from the two similar triangles, ABC and DEF, we get the proportion

$$CA : AB :: DE : EF.$$

Representing the length of the plane by l , its height by h , and the weight of the wagon and load by W , this proportion becomes

$$W : AB :: l : h,$$

whence $AB = W \frac{h}{l}$; that is the resistance of gravity due the inclination, is equal to the whole weight, multiplied by the height of the plane and divided by its length. If the inclination be one in twenty, then this resistance is equal to $1/20 W$.

In this investigation, we have neglected three trifling sources of error; arising from part of the weight being thrown from the front axles to the hind ones, in consequence of the inclination of the traces; from the diminution of the pressure of the weight, owing to its standing on an inclined surface; and from the hind wheels bearing more than half of the pressure, in consequence of the line of gravity falling nearer them.

The results of experiments fully confirm the deductions of theory as to the great increase of draught upon inclinations. The following table exhibits the force required to draw a stage coach over parts of the same road, having different degrees of inclination:

Inclination.	Force of Draught Required—		
	At 6 mls. per hour.	At 8 mls. per hour.	At 10 mls. per hour.
1 in 20	268	296	318
1 in 26	213	219	225
1 in 30	165	196	200
1 in 40	160	166	175
1 in 600	111	120	128

Putting into a different form the results of these and other experiments, we establish the following data:

Calling the load which a horse can draw on a level 100, on a rise of 1 in 100 a horse can draw only 90	
" 1 in 50 " " " "	.81
" 1 in 44 " " " "	.75
" 1 in 40 " " " "	.72
" 1 in 30 " " " "	.64
" 1 in 26 " " " "	.54
" 1 in 24 " " " "	.50
" 1 in 20 " " " "	.40
" 1 in 10 " " " "	.25

In round numbers, upon a slope of 1 in 44, or 120 feet to the mile, a horse can draw only three-quarters as much as he can upon a level; on a slope of 1 in 24, or 220 feet to the mile, he can draw only half as much; and on a slope of 1 in 10, or 528 feet to the mile, only one-quarter as much.

This ratio will, however, vary greatly with the nature and condition of the road; for, although the actual resistance of gravity is always absolutely the same upon the same inclination, whether the road be rough or smooth, yet it is relatively less upon a rough road, and does not form so large a proportional share of the whole resistance.

Thus, if the friction upon a road were such as to require, upon a level, a force of draught equal to one-fortieth of the load, the total force required upon an ascent of 1 in 20, would be $\frac{1}{40} + \frac{1}{20} = \frac{3}{40}$. Here

then the resistance of gravity is two-thirds of the whole.

If the road be less perfect in its surface, so that its friction $= \frac{1}{20}$, the total force upon the ascent will be $\frac{1}{40} + \frac{1}{20}$; and here then the resistance of gravity is one-half of the whole.

If the friction increase to one-tenth, the total resistance is $\frac{1}{40} + \frac{1}{10} = \frac{5}{40}$; and here, gravity is only one-third of the whole.

We thus see that on a rough road, with great friction, any inclination forms a much smaller part of the resistance than does the same inclination on a smooth road, on which it is much more severely felt, and proportionally more injurious; as the gaps and imperfections which would not sensibly impair the value of a common knife, would render a fine razor useless.

The loss of power on inclinations is indeed even greater than these considerations show, for, besides the increase of draught caused by gravity, the power of the horse to overcome it is much diminished upon an ascent, and in even a greater ratio than that of man, owing to its anatomical formation and its great weight. Though a horse, on a level, is as strong as five men, yet on a steep hill it is less strong than three; for three men, carrying each 100 lbs., will ascend faster than a horse with 300 lbs.

Inclinations being always thus injurious, are particularly so, where a single steep slope occurs on a long line of road which is comparatively level. It is, in that case, especially important to avoid or to lessen this slope, since the load carried over the whole road, even the level portions of it, must be reduced to what can be carried up the ascent.—Thus, if a long slope of 1 in 24 occurs on a level road, as a horse can draw up it only one-half of his full load, he can carry over the level parts of the road only half as much as he could and should draw thereon.

The bad effects of this steepness are especially felt in winter, when ice covers the road, for the slippery surface causes danger in descending, as well as increased labor in ascending. The water of rains, also, runs down the road and gullies it out, destroying its surface, and causing a constant expense for repairs, oftentimes great enough to pay for a permanent improvement.

The loss of power on inclinations being so great as has been shown, it follows that it is very important never to allow a road to ascend or descend a single foot more than is absolutely unavoidable.—If a hill is to be ascended, the road up it should nowhere have even the smallest fall or descent, for that would make two hills instead of one; but it should be so located and have such cuttings and fillings, as will secure a gradual and uninterrupted ascent the whole way.

In this point engineering skill can make wonderful improvements. Thus, an old road in Anglesea, laid out in violation of this rule, rose and fell between its extremities, 24 miles apart, a total perpendicular amount of 33,540 feet; while a new road laid out by Telford between the same points rose and fell only 2,257 feet; so that 1,253 feet of perpendicular height is now done away with, which every horse passing over the road had previously been obliged to ascend or descend with its load.—The new road is, besides, more than two miles shorter. Such is one of the results of the labor of a skilful road-maker, and many such improvements might be made in our American roads.

Undulating Roads.

There is a popular theory that a gentle undulating road is less fatiguing to horses than one which is perfectly level. It is said that the alternations of ascent, descent, and levels call into play different muscles, allowing some to rest while the others are exerted, and thus relieving each in turn.

Plausible as this speculation appears at first glance, it will be found on examination to be untrue, both mechanically and physiologically; for, considering it it in the former point of view, it is apparent that new ascents are formed which offer resistances not compensated by the descents; and in the latter, we find that it is contradicted by the structure of the horse. The question was submitted by Mr. Stevenson* to Dr. John Barclay of Ed-

* Report of the Edinburgh Railway.

* Sganzin, p. 89.

* This proportion depends on the degree of friction assumed, a subject to be investigated in the following section.

inburch, "no less eminent for his knowledge, than successful as a teacher of the science of comparative anatomy," and he made the following reply:—"My acquaintance with the muscles by no means enables me to explain how a horse should be more fatigued by travelling on a road uniformly level, than by travelling over a like space upon one that crosses heights and hollows; but it is demonstrably a false idea, that muscles can alternately rest and come into motion in cases of this kind."

To be continued.

New York, March 12, 1850.

EDITORS R. R. JOURNAL:

The daily papers this morning announced another locomotive explosion, on the Troy and Schenectady road. This is the second event of the kind in this immediate vicinity within as many weeks. There is a cause for these things, and it should be ferreted out. We cannot recall the the past, or recussitate the dead; but we certainly can guard the future, and protect the living.

How the recent accident occurred the public is not advised; probably the fireman, if he should recover of his wounds, may be able to give some explanation. It will be rare, however, if he give the true one, if that involves either himself or the engine driver. The cause of the other explosion—I refer to that at Whitehill, on the Camden and Amboy road—is fully explained; and it had its origin in an evil, that I have often witnessed, and against which those in charge of railroads are imperiously called upon to guard. In that case, an engine driver who had formerly been upon the road, and an acquaintance of the man in charge of the machine, was, in accordance with a very bad custom, passing over the road, on the engine—it being to him a privileged push—of course there was the machine to be talked about, there were old times to be revived and discussed, old acquaintances to be enquired after, and old scenes to be reviewed and their merriment to be gone over again. In all this gossip the engine driver became interested, and forgot, for the moment, that the water in his boiler was going down, until startled by a sudden recollection, he finds it far below the safety point. In an instant both pumps are put on, and two streams of cold water are thrown in upon red hot iron. Quick as thought, the accumulated steam, rushing through the valve, starts off the machine at the rate of 60 miles an hour; the engine man is startled, and does the very worst thing possible—he closes the throttle valve, and with it the only aperture for steam escapement; in an instant there is an explosion, and he, his crony, and his fireman are in eternity. This is the simple history; any man can read it; I have seen its workings upon my own road oftentimes, but fortunately no such catastrophe has followed.

The same evil may and will result from too much intimacy between engine men and firemen. They frequently have too much to gossip about while in the discharge of duty; and I venture the prediction that after this manner has the "Boston" been exploded on the Troy road.

There is a remedy, and it is a simple one. The privilege claimed by engine men and firemen of travelling over roads on the engines, should be entirely abolished. Give such the freedom of the road, if you please, in the train: but keep them off the engines. Public safety absolutely requires it. The engine driver holds the lives and limbs of his passengers in the hollow of his hand. He has the charge of a piece of workmanship as nice and delicate almost as the human form. It requires his

constant attention, and with the track, his unceasing watchfulness and vigilance. There should, therefore, be no one about him to distract his attention with other things. Even his fireman should not interrupt him, while running, save with a question as to duty; and that as seldom as practicable. He should not converse with his fireman, except to give him a necessary order. There is time enough when off duty for conversation; it is dangerous on the footboard.

I trust that conductors of railroads will appreciate and apply a prompt remedy to this evil. It is not a new thing to me. I have noticed it often, and reflected much upon it. On my own road I have given strict orders to guard against it; but these are sometimes broken over, and always denounced, because they contravene a custom that engine men and firemen have established, and do not like to surrender. But it must be abolished, or we shall have more such scenes to record, with probably more disastrous results. I respectfully call upon those in charge of roads to abolish this privilege at once; and in addition to that, to promulgate strict rules of non-intercourse between engine men and firemen, while on the road, so that it shall become every where a fixed principle of duty. We must co-operate in these things—these that seem small things—in the regulations of our roads, and then we shall have advanced another step or two in the preservation of life and property.

Yours truly,

A WESTERN RAILROAD MAN.

Massachusetts.

Eastern Railroad.

We are indebted to Mr. Neal, President of the Eastern railroad, for an interesting statement of the income and expenditures of that road for the year ending Dec. 31, 1849, and of the position of the capital of the corporation and the construction accounts of that date.

The total income was: from 1,049,114 passengers (824,121 of which on the main road) \$404,071 68; from 70,348 tons freight (61,440 of which on main road) \$63,912 79; parcel post, \$6,489 26; mail, \$8,324 00; miscellaneous, \$8,345 92; from property (East Boston ferry and lands, Portsmouth Bridge, &c.,) \$26,085 52. Total, \$517,929 17.

The expenses were as follows: machine shop, \$1,842 83; maintenance of way, \$35,719 21; locomotive power, \$67,904 63; train expenses, \$28,325 86; office establishment, \$18,303 66; station expenses, \$22,732 41; ferry, \$7,665 55; mail, \$786 05. Total, \$183,280 20—making the net income \$333,948 97, of which \$25,706 08 was applied to interest, and \$259,724 00 to dividends—leaving a surplus of \$48,518 89.

There was a surplus in 1848 of 136,135 72, which added to above makes 184,654 61. Deducting from this sum 21,804 01 for renewal, damages, and accidents, and 37,180 84 for difference between cost of laying eight miles of new rails and value of old rails sold, and the actual surplus, Dec. 31st, 1849, was 125,667 76.

The number of miles run in 1849 was 278,573, (of which by passenger trains 216,686) at an expense of 66 4-100ths per mile.

The capital account stands thus: 26,984 shares of road in Massachusetts have been issued, and 1,516 are on hand; 4925 shares of road in New Hampshire have been issued—making in all 33,425 shares at \$100—whole capital \$3,842,500.

The construction account shows the cost of the road as follows: main line in Massachusetts, (38,

201 miles) 2,300,212 95, or 60.212 per mile; Marblehead branch (3 miles) 55,843 05, or 18,614 do Gloucester branch (13 108 miles) 341,905 20, 29,037 per mile; Salisbury branch, (3.779 miles) 80,012 88, or 21,173 per mile; road in New Hampshire (16.553 miles) 493,082 84, or 29,788 per mile; equipment of road 341,991 19—making total cost, \$3,612,348 21.

This statement shows a balance of capital over the cost of 230,151 79; to which are added the surplus income, as above, 125,667 76, and tearing establishment and gravel account profits, 3,965 22—giving the actual amount of receipts over construction, 359,786 77, which is invested in East Boston depot estate, lands, ferry stock, Portsmouth bridge stock, Essex railroad stock and bonds [74,169 32] and Grand Junction do. [52,123 37.]

The debt of the company not funded is as follows: dividends payable Jan. 1850, 127,636 00; do. in former years not called for, 2,190 19; notes payable, 269,667 03; balance reserved on contracts, 315 10—total, \$399,748 32. To meet this debt the company hold notes receivable, stock on hand, balances due income, Penobscot Navigation stock, company's stock, [1,516 shares, stated above as unsold] old rail, cash, etc., estimated at the full am't. of the debt.

Cleveland, Ohio.

This beautiful city of the lakes is at the present time in the enjoyment of an unusual degree of actual and prospective prosperity. Her canal and lake commerce—her railroads which will soon connect her with the eastern, western, and southern portions of the Union—her plank roads, which are "penetrating the interior" and furnishing to the neighboring towns and villages the means of easy access to market and trade—her telegraphs, healthful climate, elegant public and private residences, tasteful grounds, beautiful groves and parks, and generous hospitalities, are rapidly concentrating in the "Forest City" a numerous, enterprising and enlightened population.

Cleveland will soon have a railway connection, south with Columbus and Cincinnati—a railway connection west with Toledo, Chicago, and with the chief towns in northern Indiana and Illinois—a railway connection with Pittsburgh and Philadelphia, and another railway connection with Buffalo, uniting with New York and Erie railroad at Dunkirk, and the associated railroad companies through the interior of the Empire State—thus furnishing her with iron roads west to the Mississippi; south to the Ohio: east to Philadelphia, New York and Boston.

Cleveland is the great depot of the coal of northern Ohio, which, in connection with the limitless facilities she will soon enjoy, for trade and commerce, must make her the most desirable locality for manufacturing establishments of all kinds, in the northwest; and men of capital and enterprise are already directing their attention thitherward.

In addition to these and numerous other business facilities, Cleveland is the most desirable town in the "great west" to live in. The town is clean, tasteful, elegant and healthful; for vegetables, fruit and flowers it is pre-eminent—for groves, parks, ornamental trees and shrubs, it is hardly surpassed by New Haven—and these attractions have drawn and will continue to draw hundreds and thousands thither—simply as the most comfortable and desirable place to live in. Her public and private schools are excellent—her Medical College, superior to any in the west, and the prevailing character of her society, educational, moral and religious—it is therefore "just the spot" for the man of moderate income to live and educate his family. The population of Cleveland is now nearly 20,000—in ten years it will not be much less than 50,000.—*Cin. Gaz.*

Illinois.

The subscriptions to the Rock Island and La Salle railroad reach \$292,000. Only \$300,000 is needed. The Chicago Journal says:

The expense of building the road has generally been estimated at \$10,000 per mile—the cost of the Galena road, 25 miles out, having been \$6,000 per mile. So level is the ground between Rock Island and Peru, that the greatest ascent per mile does not exceed 15 feet, and generally ranges at from four to five feet.

Virginia.

The work of constructing the Orange and Alexandria railroad was commenced at Alexandria on the 4th inst.

Alabama.

In Pensacola, 200,000 dollars have been subscribed to the railroad from that point to Montgomery, Ala.

The New Orleans papers are discussing a project for connecting New Orleans with the great lines of railroads running north. A charter for a road from Girard on the Chattahoochee river, opposite Columbus, Georgia, to some point on Mobile bay, has been resuscitated and an attempt is making to get the stock taken. The route is said to be very favorable and the road [230 miles] can be made and equipped, it is stated, for \$10,000 per mile.—The Bulletin says:

From the considerations of expedition and convenience, this road will monopolize the travel between New Orleans and Mobile. By the time the work is completed, the road from Columbus to Macon which is in rapid progress, will have been finished, and the road from the Central railroad, through Waynesborough to Augusta, as well as the road from Branchville on the South Carolina road to Wilmington, N. C.; and thus there will be a continuous line of railway from Mobile Bay to Boston. The following figures will show what time will be consumed in travelling between New Orleans to Charleston and Savannah:

Mobile Bay to Columbus.....	230 miles.
Columbus to Macon.....	105 "
Macon to Waynesborough.....	100 "
Waynesborough to Augusta.....	50 "
Augusta to Charleston.....	135 "
Total.....	620 "

which, at 20 miles per hour, would make the time 31 hours, or from Mobile Bay to Savannah by railroad from Macon the distance would be 536 miles, and the time 26½ hours. Add eight hours between New Orleans and Mobile Bay, and the distance to Charleston can be accomplished in 39 hours, and to Savannah in 34 hours—so that we might with ease reach New York from the Crescent city in from 4 to 4½ days.

ATLANTIC AND ST. LAWRENCE RAILROAD.

We copy from the treasurer's books a statement of the business of this road for six months ending Dec. 20, 1849, which were as follows:

Net receipts.....	\$72,421 57
Expense.....	30,306 65

Net receipts.....\$42,115 92

This exhibit, it will be perceived, gives a handsome net income for the business of the road, when it is taken into consideration that on the trunk line the road was in operation no further than Mechanic Falls until September, at which time it was opened for travel to Oxford, and in January to Paris Cape. Neither did it receive full receipts from the Androscoggin and Kennebec road, as this road was not in operation further than Readfield, until December, at which time it was opened to Waterville.—*Portland Advertiser.*

RAILWAY CALLS IN ENGLAND.

The "calls" payable during January, 1850, so far as advertised, amount to £1,734,379 against £3,926,342 in 1849; £4,860,220 in 1848; and £6,157,863 in 1847. The total calls during the year amount to about £20,000,000, of which £18,000,000 are for English, Irish, and Scotch, and £2,000,000 for foreign subscribed for in England. The calls in 1848 were £33,000,000; and in 1847, \$42,000,000.

ALABAMA AND FLORIDA RAILROAD.

The Pensacola Democrat of the 26th ult. says: On Saturday evening last, a meeting of our citizens took place in the City Hall for the purpose of considering the propriety of the city taking \$50,000 or more of the Alabama and Florida railroad. The proposition was submitted in the form of a resolution and adopted unanimously. The meeting was addressed in advocacy of said resolution by Hon. B. D. Wright, Hon. Walker Anderson and Hon. Dillon Jordan. The meeting was an unusually large one, and much enthusiasm and zeal seemed to prevail in reference to the grand project.

STATISTICS OF THE REVENUES AND EXPENDITURES OF THE BRITISH GOVERNMENT.

AN ACCOUNT OF THE NET PUBLIC INCOME AND EXPENDITURE OF THE UNITED KINGDOM OF GREAT BRITAIN AND IRELAND IN THE YEAR ENDING JANUARY 5, 1849, (after abating the expenditure thereon defrayed by the several revenue departments), and of the actual issues or payments within the same period, exclusive of the sums applied to the redemption of funded or paying off unfunded debt, and of the advances and re-payments for local works, &c.

INCOME OR REVENUE.

Ordinary Revenue and Receipts.

	£	s.	d.
Customs.....	20,999,132	3	4
Excise.....	14,154,054	19	9
Stamps.....	6,643,772	1	11
Taxes (land and assessed).....	4,314,704	8	8
Property tax.....	5,347,364	19	9
Post office.....	815,000	0	0
Crown Lands.....	81,000	0	0
Duties on Pensions and Salaries.	4,559	5	0
Small branches, hereditary revenues of the Crown.....	9,202	8	9
Surplus fees of regulated public Offices.....	53,548	3	5
<i>Other Receipts.</i>			
Produce of the sale of old stores.	308,415	14	9
Repayment of sums received into commissariat chest at Hong Kong, out of indemnity paid by Chinese government.....	539,305	9	6
Imprest and other moneys.....	57,853	14	4
Money received from the East India Company.....	60,000	0	0
Unclaimed dividends (more than paid).....	803	14	1
Total income.....	53,388,717	3	3
Excess of expenditure over income.....	796,419	14	6
	£54,185,136	17	9

EXPENDITURE.

Funded Debt.

Interest and management of permanent debt.....	23,978,113	0	9
Terminable annuities.....	3,795,076	10	11
<i>Unfunded Debt.</i>			
Interest on exchequer bills.....	790,327	16	0
Civil list.....	395,245	0	0
Annuities and pensions for Civil, Naval, Military and Judicial services, &c., charged by various acts of Parliament on the consolidated fund.....	509,762	5	2
Salaries and allowances.....	271,381	4	10
Diplomatic Salaries and Pensions	166,492	17	9
Courts of Justice.....	1,098,403	7	9
Miscellaneous charges on the consolidated fund.....	342,549	1	10
Army.....	6,647,284	4	7
Navy.....	7,922,286	19	7
Ordnance.....	3,076,124	0	0
Kafir war.....	1,100,000	0	0
Miscellaneous, chargeable on the annual grants of Parliament, including £276,377 9s. 6d. for relief of distress in Ireland....	4,092,090	8	7

Total expenditure.....54,185,136 17 9

The amount of the Window Duty assessed in the year ending April 5, 1848, was £1,880,325; the amount received was 1,811,742. The number of houses charged was 485,143.

The amount of excise duty on bricks in the year 1848, was £448,310.

Amount of tax on dogs for the years ending January 5, 1845, to January 5, 1849.—Years ending January 5, 1845, £137,948; 1846, £136,037; 1847, £135,590; 1848, 137,774; and 1849, £134,837.

Amount of Duty on Hops for the Year 1849.

Old duty at 1 12-20d per lb.....	79,791
New duty at 04 8-20d per lb.....	58,976
Additional duty on 5 per cent., per Act 3 Vict., c. 17.....	6,936

\$145,703

Net produce of the revenue of Ireland in the years ending Jan. 5, 1847, 1848, and 1849, with the expenditure of the same years:

Years ending Jan. 5.

	1847.	1848.	1849.
Customs.....	2,258,043	2,009,133	2,069,773
Excise.....	1,467,060	1,152,932	1,321,915
Stamps.....	573,767	567,996	542,924
Post Office.....	29,000	59,000	39,000
Miscellaneous, including repayment of advances.....	364,592	536,783	311,863
Total.....	4,692,462	4,325,844	4,275,375

Expenditure.....4,781,815 4,193,542 4,294,457

Amount of the Funded Debt, Annual Interest, and the Total Charge on the same, on Jan. 5 of each year, from 1828 to 1849 inclusive.

	Total capital unredeemed.	Annual interest.	Total charge, including annuities, etc.
	£	£	£
1829.....	772,332,540	25,342,549	28,245,534
1830.....	771,251,932	25,328,976	28,285,900
1831.....	757,486,996	24,102,200	27,674,754
1832.....	755,543,884	24,038,514	27,658,299
1833.....	754,100,549	23,993,290	27,703,433
1834.....	751,658,883	23,912,748	27,782,116
1835.....	743,675,299	23,603,502	27,783,454
1836.....	758,549,866	24,054,652	28,403,305
1837.....	761,422,570	24,155,320	28,533,192
1838.....	762,275,188	24,165,256	28,524,739
1839.....	761,347,690	24,135,180	28,585,503
1840.....	766,547,684	24,290,241	28,748,794
1841.....	766,371,725	24,283,940	28,556,324
1842.....	772,530,758	24,444,231	28,701,456
1843.....	773,068,340	24,459,843	28,609,708
1844.....	772,169,092	24,432,020	28,516,882
1845.....	769,193,644	23,719,148	27,839,244
1846.....	766,672,822	23,642,677	27,702,890
1847.....	764,608,284	23,580,033	27,603,224
1848.....	772,401,851	23,813,746	27,753,663
1849.....	774,022,638	23,862,257	27,699,740

Account of the articles now subjected to excise duties in Great Britain with the rates of duty.

Bricks, small, 5s. 10d. per 1000, and 5 per cent.

" large, 10s. per 1000, and 5 per cent.

Hops, 2d. per lb., and 5 per cent.

Malt, from barley, in England and Scotland, 2s. 7d. per bushel, and 5 per cent.

Malt, from Bere or Bigg, in Scotland, 2s. per bushel, and 5 per cent.

Paper, 1½d. per lb., and 5 per cent. on all kinds of paper.

Soap, hard, 1½d. per lb., and 5 per cent.—Soft, 1d. per lb., and 5 per cent.

Spirits, in England, 7s. 10d per gallon.

" in Scotland, 3s. 8d. per gallon.

Return of Total amount of the unredeemed funded debt, and of the unfunded debt, for the year ending Jan. 5, 1848 and 1849:

	1848.	1849.
Unredeemed funded debt.....	772,401,851	774,022,638
Unfunded debt—Supplies and consolidated fund.....	17,974,500	17,794,700

ABSTRACT of Colonial expenditure by Great Britain in the years 1846-7. The sums given include the Civil, Military, and Naval expenditure of each Colony, so far as paid by Great Britain.—The civil expenditure is chiefly for passage allowances for Governors and other officers, convict establishments and charges, ecclesiastical establishments, &c., (fractions omitted.)

Military and Marine Stations.

Gibraltar.....	179,073
Malta.....	106,996
Cape of Good Hope.....	685,444
Mauritius.....	90,591
Bermunda.....	73,628
St. Helena.....	25,668
Ionian Islands.....	85,044
Falkland Islands.....	1,186
Hong Kong.....	94,600

Plantations and Settlements.

Jamaica, Bahamas, and Honduras.....	189,626
Other West India Islands and Guiana...	307,060
Canada.....	474,789
Nova Scotia, New Brunswick, Prince Edward's Island and Newfoundland...	170,464
Sierra Leone, Gambia, and Cape Coast..	42,690
Ceylon.....	83,470
Western Australia.....	7,513
Southern Australia.....	4,588
Northern Australia.....	1,876
New Zealand.....	84,494

Penal Settlements.

New South Wales.....	79,196
Van Dieman's Land.....	92,182
General Charges.....	46,091

Total.....2,938,069

LENGTH OF SEACOAST OF THE UNITED STATES.

From the report of the commissioner of the General Land Office, we obtain the data for the following statement, exhibiting the length of the seacoast of the United States:

	Miles.
From the northern limits of the U.S. to the Cape of Florida, on the Atlantic Ocean.....	1,900
From the Cape of Florida to the mouth of the Rio Grand, on the Gulf of Mexico.....	1,600
From the boundary point one league south of the port of San Diego, on the Pacific, along the coast of Oregon and the Straits of Fuca, to the boundary point 49° north latitude.....	1,620
Making together the length of seacoast on the Atlantic, Gulf, and Pacific....	5,120
Or a "shore line" following the irregularities of the shore and sea islands, according to an estimate of the Superintendent of the Coast Survey, of	33,063

The Lake Country Coal Trade.

The following statement relative to the coal trade of the lakes, is condensed from the Buffalo Commercial:

The lake markets are supplied with anthracite and bituminous coals. The anthracite is from Schuylkill, Lehigh and Lackawanna counties, Pa., chiefly conveyed from Philadelphia by sea to Albany, the Erie, Champlain and Oswego canals to the lake country. In this market, this kind of coal can be furnished for \$7 per ton. It is used by our iron makers for casting. Bituminous coal, of which large quantities reach the lakes, is obtained from several sources in different States. This coal is made use of here for smithing and fuel; and is sold at \$6 a ton.

The quantity of anthracite and Blossburg coal delivered at Buffalo, by the Erie canal, in 1849, was 13,367,595 pounds, and at Oswego 6,608,422 pounds.

Large quantities of bituminous coal are obtained from coal fields in the northwestern part of Pennsylvania, 60 to 80 miles south of Lake Erie. This

coal is of superior quality, and is extensively used by boats and other machinery driven by steam, as well as for smithing and domestic purposes, large supplies reach Erie. Bituminous coal is also obtained in Ohio from beds lying along the line of the Ohio canal and eastward from the Lake 50 to 80 miles. This coal is preferred by many to the Erie coal. Neither of these coals are as highly bituminous as the Blossburg. In 1849, 1,910,474 bushels were received at Cleveland. It is sold at the same rate as at Erie, from \$2 50 to \$3 per ton. Erie and Cleveland coal is worth in Buffalo \$4 per ton.

From Erie to Cleveland, it is freighted at cheap rates by vessels which fill up their cargoes with this description of loading. Canadian ports are largely supplied with this article. In 1848, the shipment of coal from Cleveland to American and Canadian ports was 131,200 tons.

Another source of supply is the beds lying on the line of the Michigan and Illinois canal in Illinois, distant from Chicago to Lake Michigan, 60 to 80 miles. This canal was opened in 1848, but little coal came to market that year. In 1849, 5,150 tons reached Chicago. The upper part of these beds furnish coal highly charged with sulphur, which confines the use of it principally to household purposes, for its being so destructive to grate bars and boilers. But the quality of the coal is improving the deeper the beds are worked, and the prospect is, that this coal will very soon be as free from this objectionable matter as the Cleveland and Erie.

RATES OF TOLL OF THE SCHUYLKILL NAVIGATION COMPANY.

Office of the Schuylkill Navigation Co., }
March 7, 1850.

Notice is hereby given that the rates of toll and the use of cars for anthracite coal transportation on the Schuylkill Navigation for the year 1850 will be as follows:

To be charged Per Ton of 2240 Pounds.

The weight to be ascertained by such means as may be adopted to secure accuracy, and five per cent. allowance to be made therefrom for loss by wastage. The toll for all coal, including the use of cars, coming from the several points, to be charged as per the following table:

No charge less than twenty-five cents per ton shall be made for toll and the use of cars for any distance.

	From Mt. Carbon, Schuylkill Haven, do.	Pt. Clinton, Cts. per ton.	Pt. Carbon, Cts. per ton.
To Orwigsburgh Landing.....	25	25	25
Hamburg.....	25	25	25
Mohrsville.....	36	35	32
Althouses.....	41	40	37
Reading.....	46	45	42
Birdsborough.....	51	50	47
Port Union.....	51	50	47
Pottstown Landing.....	56	55	52
Royer's Ford.....	56	55	52
Phenixville.....	61	60	57
Lumberville.....	61	60	57
Pawling's Dam.....	61	60	57
Valley Forge.....	61	60	57
Port Kennedy.....	66	65	62
Norristown and Bridgeport.....	66	65	62
Plymouth Dam.....	66	65	62
Consebocken.....	71	70	67
Spring Mill.....	71	70	67
Manayunk.....	76	75	72
Philadelphia.....	76	75	72

The Navigation is now open for use between

Philadelphia and Reading, and boats will be cleared at Port Clinton and Schuylkill Haven on the 11th inst., and at Pottsville and Port Carbon on the 15th inst.

By order of the Managers,

T. FRAILEY, President.

VERMONT VALLEY RAILROAD.

At a meeting of the stockholders of this company, held at Bellows Falls, the following gentlemen were chosen directors for the year ensuing, viz:—Charles Chapin, Brattleboro'; Horace Brooks, N. York; P. R. Chandler, Putney; Hugh H. Henry, Chester; Franklin Evans, Boston; Charles Paine, Northfield; Charles Linsley, Middlebury. Dr. Chapin declined serving longer as President, and Hugh H. Henry, of Chester, was chosen in his place. Robert Schuyler, of New York, was chosen Treasurer, and B. D. Harris, Clerk.

Vermont.

Rutland and Washington Railroad.—The annual meeting of the stockholders of this company was held at Poultney a few days since, and the following gentlemen were elected directors: Merritt Clark, Henry Stanley, Poultney; Horace Clark, Middletown; John Bradley, Timothy F. Strong, Burlington; N. H. Graves, Granville; and M. G. Langdon, Castleton.

The work is proceeding rapidly, and is expected to be opened for business from Rutland to Poultney early next summer. A New York corporation called the Troy and Rutland railroad company has been formed under the law of that state, and we learn that the stock has been taken, and contracts are about to be or have already been entered into for the construction of the road from the termination of the Rutland and Washington, (at the state line in Salem we believe) to Eagle Bridge, on Hoosic river, twenty-two miles north from Troy. From this point it is the intention of the company to reach Troy either by an independent track, or by the Troy and Greenfield (Troy and Boston) road, the friends of which intend to push it forward with all practical despatch. The distance from Rutland to Eagle Bridge is about fifty-seven miles.

The Railroad Journal.

The American Railroad Journal was the earliest work published in any part of the world devoted to the railway interest. In its pages is to be found the only full and complete history of railway progress, the only authentic record of the discoveries and improvements which the greatest of practical science has drawn forth and perfected.

The means of enhancing its value under its present proprietorship are far greater than when we assumed its charge about one year ago. It will continue to furnish the best practical results as to the construction and working of railroads, the details of progress in steam navigation, commerce, mining, manufactures, banking and the mechanic arts.

The best practical talent that can be enlisted in the country is engaged to supply its pages. The mining interest will find evidence of the first systematic attempt to give a full view of the iron, copper and lead ores of the country, with the results of practical working. In all the branches of mechanical industry we seek to discard the crude conceits of unskilled pretension, the thousand useless novelties issuing from the Patent Office, and to give encouragement to whatever can be made useful in relieving the wants, in ministering to the pleasures, or contributing to the advancement of the race.

We invite contributions to its pages from all who sympathize in our labors, information in any form from those most interested in the progress of mechanical invention, and substantial support from

all who are willing to aid us in the arduous duties of our position.

AMERICAN RAILROAD JOURNAL.

Saturday, March 16, 1850.

United States Railroad Guide and Steamboat Journal.

CONTAINING OFFICIAL TIME ADVERTISEMENTS, Tables of Stations, Distances, Fares, Time, etc., with much miscellaneous matter for the travelling public. Price 12 cents a copy. Yearly subscription \$1. Published at 43 Ann street, New York.

Back Volumes of the RAILROAD JOURNAL

From its commencement can be had on application to this office.

ROADS AND RAILROADS.

We commence this week the publication of such extracts from a work on "Roads and Railroads,"* as may be useful to those engaged in this important branch of industry, with such illustrations as may assist to an easy understanding of the text.—As they are from a work of great merit, they cannot fail to be valuable to our readers.

* A Manual of the Principles and Practice of Road Making: comprising the location, construction and improvement of roads, (common, Macadam, paved, plank, etc.) and railroads, by WM. M. GILLESPIE, A.M. C.E., Professor of Civil Engineering in Union College. Published by A. S. Barnes, 51 John St., New York. We have had occasion to speak of this excellent work, which should be in the hands of every person engaged in road making. It is a lucid statement of all the abstract principles which lie at the foundation of the various kinds of roads, with a practical application of them. It may serve equally as a guide in the studies of the closet, as well as in working in the field.

CONTRACTORS

Are requested to notice the Advertisements of the Orange and Alexandria Railroad, and the Queens-ton Bridge Co.

NOTICE TO SUBSCRIBERS.

Such of our Subscribers as wish for back numbers of our paper to complete their sets, or who may not have received the index of the past year, are requested to send for them without delay.

Lake Superior Copper Region.

Miners and others about to visit the upper lakes the coming season are invited to examine the advertisement of C.A. Trowbridge in another column.

Coal Trade of London.

We conclude this week an elaborate article upon the Coal Trade of England. It is very interesting, as presenting a distinct view of the operations of a business, the object of which is to supply an empire with fuel; and as illustrating, in a very forcible manner, the social and economical condition of things in that country. The tax wrung from the coal at every step of its journey from the moment that it is mined, to the time when it reaches the grate for consumption, presents a striking contrast to the entire freedom of trade in this country. This subject is a good illustration of the real condition of the doctrine of free trade in England. The great evil of the state of things which this article quoted presents, is, that those who are the recipients of this tax on coal are so many persons added to the list of non-producing classes, and their support is an additional burden upon the productive industry of the

country. But few useful hints can be gathered from the system which prevails in England, instructive to the trade here. When we come to the matter of mining, the case will probably be different. We hope to be able soon to obtain a succinct statement of the mining operations in Great Britain. In the mean time will not some of our subscribers in Pennsylvania and other portions of the country, furnish us with a history of mining operations in the United States.

Minifie's Text Book of Drawing.

This work upon "Geometrical Drawing" seems to us admirably adapted to meet a want which has been felt by teachers of drawing upon scientific principles. To such it must prove an efficient assistant. But this is not its only recommendation, for it seems to us that a student may, by a careful study and practice of its rules, attain excellence as a draughtsman without the aid of a master.—To learn to draw accurately and with ease requires patient application and long practice, but so great is the advantage resulting from the requirement of this art to men in all stations that no young man should consider his education complete without it, and an evening or two in each week passed with such an agreeable and instructive companion as Mr. Minifie's book would be most profitably employed.

Influences of High Taxes upon the Manufacturing Interests of Great Britain.

We have collected the table of statistics to be found in another part of this week's paper from authentic sources, not only as useful and interesting information touching the financial condition of Great Britain, but as having an important bearing upon the question as to which country, Great Britain or the United States, is to be the successful rival in the contest to see which is to be the manufacturer for the rest of the world. In this branch of industry the former power has no rival in Europe, and what has given to that country its vast wealth, and enabled it to sustain the enormous burdens imposed by its government, its hierarchy and nobility, is to be found in the superiority of her natural advantages joined to the stable character and patient industry of her citizens and subjects, and in the early application of steam power to the arts of life.

It was estimated many years since that the steam power employed by Great Britain performed a labor equal to that of 200,000,000 men. Such has been its rapid increase since, that we may add at least 50,000,000 to the above calculation. Now, in dealing with a country where steam power was not used, the amount saved by the English manufacturer by the use of steam, was so much money made. So long as he enjoyed the monopoly with the use of steam, he could command the market, by selling his article a shade lower than it could be produced by hand power alone. Great Britain by anticipating for a long time all other countries in the use of the steam engine, for a long time monopolized the markets of the world; and the difference in cost of production, over the old way, was to a certain extent, the measure of her gains. It was this that gave her her enormous wealth and enabled her to carry on the expensive wars which accumulated her vast public debt. The question now for consideration is, can Great Britain maintain her position by the same means by which she amassed her present wealth? We think not.

The United States must be the great rival of England, in all industrial pursuits, for the reason that the inhabitants of both countries are of the same stock and possess similar characteristics; and further, because we possess in this country superior natural advantages to those which gave her the monopoly in manufacturing over every European country. We have equally cheap motive power in our coal fields and rivers, and we produce the raw material, which form the basis of all manufacturing, many of which England is compelled to import from abroad. We have an abundance of cheap food. We are a much more ingenious and inventive people. The morale of our population is at a much higher standard than that of England, and the productiveness of labor bears a very close ratio to the intelligence of the operative. In most of the leading elements of cheap production we stand ahead of England. The disadvantage under which we labor is to be found in the higher rate of interest and in the higher price which we are compelled to pay for labor over the English manufacturer. This disadvantage is likely to remain for a long time, and certainly would render the English manufacturer successful in the contest were not this advantage balanced by the burden imposed by his government, and the domestic institutions by which he is surrounded, and which are not felt in this country; but which weigh so heavily upon the foreigner. From a careful survey of the whole ground, we believe that after capital shall become more plentiful, and experience shall have given us greater skill we shall successfully rival Great Britain, and drive her out of the market, and by reason of our freedom from taxation, a burden which the Englishman must continue to bear for an indefinite time to come. The charge upon the industry of that country for the national debt alone averages \$140,000,000 annually, five times more than the whole ordinary expenses of our government. The annual expense of carrying on the British government is about \$270,000,000, against \$30,000,000 for this country, or adding to this the expenses of State government say \$10,000,000 more—\$40,000,000. But in England the expense of supporting the general government is but a small portion of the whole burden borne by the people. The whole real estate of the kingdom is in the hands of the nobility and gentry, non-laboring and non-producing classes, and pays at a rental of \$3 per year, not an extravagant estimate, about \$234,000,000; added to these sums are the church tithes, poor rates, cost of supporting municipal corporations, etc., etc., making an amount annually drawn from the laboring man for the support of non-producing classes, which almost staggers credulity. The cost of supporting the institutions of both countries is to the same extent a drawback upon the profits of labor; of course, all other things being equal, the American can undersell the English manufacturer just to the extent of the difference of the sums that each are compelled to pay to support the institutions of their respective countries. Another great evil under which the Englishman labors is, that the recipients of this tax wrung from the profits of labor are just so many persons added to the non-producing classes. The strength of a country consists in an equal division of the property of the country. This is necessary to secure a vigorous race of men physically. This condition imparts to its people the highest morale, as, where property is nearly equally divided, the great mass are equally

removed from the enervating effects of luxury on the one hand, and degradation and want of self-respect on the other, the natural result of abject poverty. The middle classes have in all ages constituted a nation's strength and a nation's power. It was this class, the yeomanry once so numerous in England that gave her universal success in her early contests with France, which lacked to a great degree this strong arm of national defence. It is an undeniable fact, that under the present order of things, England is being divided into two great classes, the rich and the poor, at the expense of the middle class, which is losing its power to protect itself from the encroachments of the rich, and losing its ability to support the rapidly increasing persons who are coming to want. Every year witnesses the circle of landed proprietors lessening in size, and as a necessary consequence, that of the poor increasing. The burdens imposed by government are constantly increasing, while her merchants find, where they once enjoyed a monopoly of trade, a rival in every market in the world, and competition brings down the price of merchandise to the lowest possible point.

Instead of monopoly, he has rivals who possess all the art once known to him only, and who are weighed down by none of the burdens which press so heavily upon him. The disadvantages under which the English manufacturer labors, have not, we are satisfied, been sufficiently taken into account in estimating our ability to compete with him. At present we may not be able to do this. Capital and labor are, and must, for a long time to come remain at a high rate in this new country. But every day they are becoming more abundant, and every day's experience enables us to manufacture cheaper than the preceding. We are steadily approaching the point where the Englishman now stands, while his case is constantly growing worse by the diminished price he is able to obtain for his goods, and the increasing weight of the load which he must bear. Time can be the only element wanting to give the American manufacturer the same monopoly in the markets of the world that the Englishman enjoyed. This time must come, and that shortly.

Will England make an effort to relieve herself of the debts and taxes without a repudiation?—Her only safety consists in taking measures for the extinction of her debt, not by payment, but by gradual repudiation. She has already set the example for this course in cutting down the rate of interest once paid on her debt. Let her enact, that after the lapse of a certain number of years but 3 per cent. shall be paid; at another period 2½, and so on, until by refusing to pay any interest the debt shall be repudiated. By placing these periods far enough ahead, no injustice or hardship would be caused, as those now holding the state securities would have died off before government should cease to pay the interest on them, and their children coming on the stage of life would be driven to seek an honest livelihood, and both this class and the government would be incalculably the gainers by such a course. Unless this policy is pursued, the national debt of Great Britain is to be the great disturbing force in the politics of Europe; and from its influence more is to be feared than from any other cause whatever.

Kentucky.

Lexington Railroad.—We are enabled now to announce that henceforward the cars will run regularly from the depot in this city to Lexington over

the new grade. The T rail is laid along the whole route, with the exception, perhaps, of a mile—that has not been laid in consequence of some detention in the receipt of the iron. The new grade along the cliff, however, from the point of intersection with the old road to this city is completed.

We observed on yesterday, a new and very beautiful locomotive—a very large one—named "McKee," in honor to the late lessee of the road, the lamented Col. McKee. Now that the road is completed, we hope to see our fellow citizens of Lexington often. We shall not any longer have delays and vexations of "stages to the top of the hill."—*Frank. Com.*

A correspondent of the Columbus Journal gives a very interesting account of the first excursion made over the new railroad from that city to Xenia—54 miles—on the 22d of February. In his letter he pays a high compliment to Hon. Alfred Kelley, President of the Cleveland, Columbus and Cincinnati railroad, who has for a long time borne a distinguished part in promoting the public works of that State. In speaking of Mr. Kelley, the writer says:

"In 1823 his influence in the Legislature contributed mainly to the adoption of those measures which lead directly to the great system of improvements, which has placed Ohio in the position she occupies. * * These great works are accomplished, he is again called to the councils of the State, and in 1845 we find his leading mind contributing to such a system of currency as no other State in the Union can boast. And in the year following he crowns his public career by devising a system of revenue which answers all the ends it contemplated, and grows in favor as its practical operation is developed. But there was in reserve for him other and still arduous duties; and the Cleveland, Columbus and Cincinnati railroad is a monument to his indomitable energy and perseverance, of which any man might well be proud.

"And yet, Mr. Kelley seems to possess all the mental and physical buoyancy which distinguishes his earlier efforts. Long may he live to reap the fruits of his public labors, and witness that public prosperity to which he has ever been so able and so faithful a contributor."

RAILROADS IN GEORGIA AND FLORIDA.

We learn that contracts have been closed for the construction of a railroad from Columbus, Ga., to connect with the Southwestern railroad, near Fort Valley, to be completed in 1851. The Georgia papers pay the highest compliment to Major Howard, of Columbus, president of the above road, for the zeal and energy displayed by him in the above work, and ascribe its success entirely to his efforts.

The Columbus Sentinel also states that the construction of a railroad from Girard opposite Columbus, to Mobile, has already been secured. Major Robert Hardaway, to whose especial supervision it has been committed, commenced a few days since a general survey of the country through which it was to pass, and was everywhere hailed with the proffered aid of the planters, by whom the road was to be run. The grading and superstructure of the road was voluntarily undertaken for stock, by every community on the line, and in this way he has received assurances that the work will be immediately commenced, and completed, on the whole line from Girard to Mobile Bay—a distance of 230 miles. Major Hardaway is now in New Orleans, endeavoring to make arrangements for

the iron, and he writes that he anticipates no difficulty in effecting a satisfactory negotiation for that purpose. Thus the entire road from this place to the Mobile Bay, will, in a few days, be under contract, and it is not unreasonable to predict that in two years from this time, there will be a continuous steam connection between Savannah and Mobile.

BANK ROBBERY.

Geo. J. Bulloch, Cashier of the Georgia Central Railroad and Banking Company, has absconded, taking with him about \$100,000 in the notes of the Bank. It is supposed that he has gone to England, and measures have been taken to have him arrested. However mortifying may be this affair, it is a satisfaction to know, that from the ample means and high standing of the company defrauded, it will suffer no inconvenience or discredit from the loss.

North Carolina.

North Carolina Central Railroad.—The Spirit of the Age announces that all the stock in the railroad was finally taken at the Hillsboro' Convention and that five per cent. was ordered to be paid by the 30th instant. The convention for organizing the company is to be held in Salisbury in April next.

Utica, March 11, 1850.

Editor Railroad Journal:

The result of my calculation is that "J. H. D." is wrong, and Mr. Johnson right, in relation to the momentum of the car wheel. (See Railroad Journal, Feb. 9, p. 88, and March 9, p. 151.) The figures CLGHKE and CBFDAE are not similar solids, as assumed by J. H. D., hence his conclusions based on that assumption are erroneous.

The error is one which the best mathematician might easily fall into. It seems proper, however, that it should be pointed out.

The figure CBFDAE, representing the momentum of a cylindrical car wheel, is equal to a wedge and a pyramid, both having a height equal to CB = 5: the base of the wedge being 3-1416, and that of the pyramid, 3-1416 × (4 - 3-1416), and the solidity of this figure divided by the area of a circle whose diameter is 1, gives the length of the line KL. i.e.—

$$KL = \frac{3-1416^2 \times 25 + 3-1416 \times (4 - 3-1416) \times 4}{7854}$$

3-714—as Mr. Johnson has given it.

S. WHIPPLE.

Beaver Dam, Va., March 9, 1850.

EDITORS RAILROAD JOURNAL:

Gentlemen—Several important changes in the condition of the road formerly known as the Louisa road have occurred which I presume it will be acceptable to the public to know.

At the present session of the General Assembly, an act was passed appropriating 3-5ths of \$700,000 to extend the road from Staunton to Covington.—You are aware that the road is now in a course of construction from the Blue Ridge tunnel to Staunton.

Another guarantying \$100,000 of its bonds to complete the independent road from Junction to Richmond, and changing its name to the Virginia Central railroad co.

Another authorising the people on the line of its extension to the Ohio, to tax themselves by counties for raising the 2-5ths of private subscription—

This new idea takes well. It has been carried out in Augusta county, and it is believed it will be in other wealthy counties.

It is proposed to carry the road to Gyandotte on the Ohio more than 250 miles below Wheeling.—Covington is about 25 miles from each of the White Sulphur and Hot Springs and about 200 from Richmond.

To Contractors.

THE Election of Directors of the Queenston Suspension Bridge Company having taken place, the Company are now prepared to receive Plans for the Bridge and Tenders for its erection. All communications to be directed, GILBERT McMICKEN, lmlt* Queenston.

To Miners and Mining Companies.

THE undersigned would respectfully call the attention of those persons engaged in mineral operations on Lake Superior to the following list of articles which will be sold on accommodating terms, viz:

500 " Stall fed Mess Beef.
25,000 lbs. " Sugar cured canvassed" Hams.
2,200 " " Dried Beef.
60,000 " " Kiln dried" Corn Meal,
500 bush. White " Field" Beans.
300 " " Canada" Peas.
500 " " Dried Apples.
100 bbls. and half bbls. " cucumber" Pickles.
50 " Sour KROUT.
30 bush. Onions.
1,000 Beefs' Tongues Smoked and in Pickle.
10,000 lbs. " Mould" Candles.
10,000 " " Hard" Soap.

Also, a full and large supply of all articles that may be required by Mining Companies and those connected with them. C. A. TROWBRIDGE,
127 Jefferson Avenue, Detroit, Michigan.

TO CONTRACTORS.

NOTICE is hereby given, that from 30 to 60 miles of the Orange and Alexandria Railroad will be ready for examination between 1st and 15th of April next. The road passes through a very healthy and fertile region, and embraces an amount of work every way worthy of the attention of able and experienced men.

The Company prefers to let the whole work of construction in contracts of not less than 30 miles, and for that purpose parties wishing further information are invited to call at the office in Alexandria.

The bids will be made on a basis of payments in cash to the amount of 85 per cent, and the remaining 15 per cent in the stock of the company. They must be sent to this office not later than the 16th day of April next, to be submitted to the meeting of the Board of Directors to be held on the 18th of the same. By order of the Board. T. C. ATKINSON,
Chief Engineer.

For the information of parties at a distance, it is well to state that the *Orange and Alexandria Railroad* is about 90 miles long, and extends from Alexandria through Fairfax, Prince William, Fauquier, Culpeper and Orange counties to Gordonsville, a point on the completed portion of the *Virginia Central Railroad*, formerly called the Louisa railroad.

An inspection of the map will show that its connections promise to make it as valuable a thoroughfare as any in the Union.

Railroad Iron.

OF ANY PATTERN AND WEIGHT,
Of a Favorite Brand,
And deliverable in Bond, or Duty paid, at any Port of the U. S., contracted for on favorable terms, by
CHARLES ILLIUS,
20 Beaver St., New York.

Pig and other Iron also contracted for. Sole Agent for "Baxter's Machine and Burning Oil"—particularly adapted for "Railroads" and other Machinery—Preferred to Spain by the many now using it, and 25 per cent. cheaper.

Railroad Iron.

THE Undersigned, Agents for Manufacturers, are prepared to contract to deliver Rails of superior quality, and of any size or pattern, to any ports of discharge in the United States.

COLLINS, VOSE & CO.,
158 South St.

New York, November 17, 1849.

Spikes, Spikes, Spikes.

ANY person wishing a simple and effective Spike Machine, or a number of them, may be supplied by addressing
J. W. FLACK,
Troy, N. Y.
March 6, 1850.

FOWLER M. RAY'S Patent India-rubber Railroad CAR SPRING.

Troy, February 27, 1850.

We have been using your India-rubber Car Springs for nearly two years—and we take pleasure in saying that in our opinion the rubber has to a certain extent already, and may eventually entirely supersede all other Springs for Railroad Car purposes. We now use it entirely for Draw Springs and Bumpers, considering it better and lighter than steel.

During our two years' experience in the use of it, we have not known any to lose their elasticity, or fail in any way; and we cheerfully recommend the rubber for railroad car springs. Very respectfully,
EATON, GILBERT & CO.

Boston, March 5, 1850.

In answer to your enquiry about India-rubber Springs, I have to say that we have used them to a considerable extent on both freight and passenger cars, and also on several of our tenders; and I am very well satisfied that they answer all the purposes for which they are intended. I believe the India-rubber will soon supersede all other springs for cars and tenders. Yours truly,
S. M. FELTON,
Supt. Fitchburg Railroad.

Office of the New Jersey Railroad Co., }
Jersey City, March 7, 1850. }

This is to certify that we have had Mr. F. M. Ray's India-rubber Springs in constant use under our cars, and as Bumper Springs for upwards of two years, and they have in every way given perfect satisfaction.

The present form of spring we deem far superior to the form of Disk, having used both forms, although we have none of those made in Disks at present in use. We take pleasure in recommending these springs to all railroad companies.

J. P. JACKSON, Vice Pres.
New Jersey Railroad and Trans. Co.

Roxbury, February 28, 1850.

In compliance with your request, I take great pleasure in stating the result of my experience in the use of "Ray's Patented Vulcanised India-rubber Car and Engine Springs." We have used them nearly two years, and never had one fail in any way. The cold weather does not affect them, as it has other rubber springs we have used.

With sixteen years' experience as superintendent of machinery on the Boston and Providence railroad, I take pleasure in saying that your springs are the best we ever used, or I ever saw used elsewhere. We have 20 cars rigged with them, of which I can say that the springs are as good now as when first applied. I put 24 lbs. of the rubber under the forward end of one of our heaviest engines, taking off 250 lbs. of steel springs—it has been in use 18 months, and is in as good condition now as when first put under the engine.

Very respectfully yours,

GEO. S. GRIGGS,
Supt. of Machinery, Boston and Prov. R.R.

Supt. Office N.Y. & H. R.R., }
New York, March 8, 1850. }

This is to certify that we have used the Rubber Springs manufactured by Mr. F. M. Ray for the past twenty months, "both for Passenger and Freight Car Springs and Bumpers, and of different sizes," and have in every case given entire satisfaction, and I consider them the best spring now in use.

M. SLOAT, Supt.

Jersey City, March 9, 1850.

This is to certify that the present form of Mr. F. M. Ray's India-rubber Car Spring I consider far superior to the form of Disk, having used both forms. I take pleasure in recommending these springs to all railroad companies. DAVID H. BAKER,
Foreman of Car Shop of N.J. R.R. & Trans. Co.

Harlem R.R. Depot, }
New York, March 7, 1850. }

This is to certify that we have used Mr. F. M. Ray's India-rubber Springs for over eighteen months, and find them to be easy and durable, and recommend them to railroad companies as being superior to anything we have tried.

J. M. SMART,
Foreman at 42d St. Depot.

February 25, 1850.

From practical observation of the use of the India-rubber Car Springs, manufactured and sold by your company, we are entirely satisfied in their application, and do not hesitate to recommend them as elastic, durable, requiring no repairs for years, and retaining their consistency during all extremes of weather. We have applied them for the past two years, and consider them superior for all railroad purposes.

Yours truly,
OSGOOD BRADLEY, Car Builder, Worcester.
J. H. WATSON, do. Springfield.
DEAN, PACKARD & MILLS, do. do.
DAVENPORT & BRIDGES, do. Cambridgeport.

Fall River, February 2, 1850.

In answer to yours of the 20th ult. I would say that this company has for some 10 or 12 months past been using "Ray's India-rubber Springs." We have applied them to both passenger and freight cars with uniform success. They have invariably preserved their elasticity and consistency through all the extremes of weather; and we are now applying them whenever the steel spring fails. I am well satisfied that they are particularly adapted for railroad purposes.

Very respectfully yours, GEO. HAVEN,
Supt. Fall River Railroad.

New York, March 11, 1850.

I have used the Patent India-rubber Spring purchased of Mr. Ray, upon the cars of the New York and New Haven Railroad, and have found them efficient and economical; and when applied to the axles and draw springs, believe them to be quite equal to any in use. I have found a combination of these springs with a steel spring under the transom beam a very satisfactory arrangement, and am now using this plan in all new cars.

Yours respectfully,
ROBERT SCHUYLER.

Office of the Boston and Lowell Railroad, }
Boston, March 8, 1850. }

EDWARD CRANE, Esq.,
Agent New England Car Co.

Dear Sir—In reply to your note, it gives me pleasure to state, that the results of using your India-rubber Springs on this road have been altogether favorable.

They retain, so far as has been observed on this road, their elasticity in any temperature; and are equally unaffected by the oil, with which they are necessarily brought into contact, and which I at first apprehended might have an injurious effect.

Though not in my opinion so easy as the "Air-spring" in its perfect state, they are much more easily kept in order, (indeed they require nothing in the way of repairs,) and they last much longer, so that I am now substituting them for "air-springs," wherever these have been used under our cars.

Respectfully yours,
WALDO HIGGINSON,
Agent Boston and Lowell Railroad.

Office New Jersey Railroad Co., }
Jersey City, March 8, 1850. }

FOWLER M. RAY, Esq.,

Dear Sir: In answer to your enquiries respecting the operation of the Vulcanised Rubber Springs, purchased by our company from you some two years since, I reply that they are superior to any spring in use, (that I have either seen or heard of).

The improved form of your spring, consisting of a solid piece of vulcanised rubber with bands on the outside, is far superior to your first form, consisting of disks of rubber with metallic plates interposed.

The last named form was tried, if you recollect, at a much earlier period; and then was replaced by your last form.

I have no hesitation in saying that your springs have given entire satisfaction, and most cheerfully recommend them to railroad companies throughout the country for the following reasons:

- 1st. The cost is 30 per cent. less.
- 2d. Saving of weight on each car of 8 wheels from 700 to 800 lbs.
- 3d. Less care and attention is required, as they are not liable to get out of repair.
- 4th. A great saving is secured in the wear and tear of the cars and rails from their great elasticity.
- 5th. The freedom from noise.
- 6th. There is greater safety in case of accident, as they cannot be broken.
- 7th. The comfort of passengers is enhanced sufficiently to pay the expense, waiving all the other reasons that I have given.

Should this fail to satisfy any person enquiring, you are at liberty to refer to me, No. 150 Washington St., Jersey City.

Yours respectfully,
T. L. SMITH, Supt.

Great American Engineering and Mechanical Work.

PUBLISHING MONTHLY BY SUBSCRIPTION

SPECIMENS OF THE
STONE, IRON, AND WOOD BRIDGES, VIADUCTS, TUNNELS, CULVERTS, &c., of the United States RAILROADS, Illustrated by a Series of Drawings, from actual measurement of the works, including Plans, Elevations, Sections and details of each Structure, accompanied by remarks on the relative merits of the various forms of construction adopted, as regards economy, strength and durability, with Specifications, Estimates, Bills of Timber, Iron, etc., of the several structures: and an APPENDIX, illustrative of the art of Bridge Building as at present practised in Europe; and numerous original Designs for Bridges, Viaducts, Culverts, etc.; the whole calculated to meet the exigencies of Engineers, and assist Draftsmen, Bridge Builders, Mechanics and Students.

BY GEORGE DUGGAN,
ARCHITECT AND CIVIL ENGINEER.

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The First or AMERICAN DIVISION of this important work will be completed in about Twelve Parts, and the APPENDIX in about Eight Parts, each part containing Two double or Four single large folio plates, accompanied by appropriate letter press descriptions, Specifications, Estimates of the cost, Bills of Timber, Iron, &c. of each structure, presenting at a glance the comparative merits, as regards economy, strength, and durability of the various modes of Bridge construction at present practised by the most eminent Engineers in the United States.

The Engraving has been entrusted to first rate artists, and is executing in a manner that cannot fail to give satisfaction, while the price (Seventy-five cents a Month) is such as will place it within the reach of all who take an interest in our great mechanical contrivances.

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N. B.—Members of the profession, and others wishing to become subscribers, are requested to send their names without delay to the author, as below, as the publication of the names of Subscribers in one of the early Parts has been determined on, and no more copies of the work will be printed than are found necessary to supply Subscribers. Parties remitting \$9, the cost of First or AMERICAN DIVISION of the work, shall receive it monthly as published, POST FREE, in any part of the United States. To those remitting \$5, and the remainder in six months, it will be sent regularly as published, POSTAGE UNPAID.

Engineers in charge of Railroad Works, are respectfully requested to send Drawings of their Drawings of Bridges, &c., with the Specifications, Bills of Timber, Iron, &c., to GEORGE DUGGAN at his residence No. 179 Henry Street, New York, with a view to their insertion in this work.

STABILITY—SECURITY—PERPETUITY. Mutual Life Insurance Co. of New York.

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A MILLION OF DOLLARS

Securely invested in Bonds and Mortgages on real estate in this city and Brooklyn, and stocks of the State and City of New York and United States Government.

This fund is rapidly increasing, by a widely extended and prosperous business.

The company declared a dividend of profits of fifty-two per cent. on all existing policies on the 31st of January, 1848.

All the Profits are Divided Among the Insured.

The premiums are payable in Cash annually, semi-annually, or quarterly, interest being added on the deferred payments.

The cash principle adopted by this company secures to the parties for whose benefit the insurances are effected, the whole of the advantages, without subjecting them to the heavy drawback of accumulated premium notes.

Persons may effect insurance on their own lives and the lives of others.

A married woman can insure the life of her husband, the benefits of which are secured by law for the exclusive use of herself or children.

Clergymen and all others dependent upon salaries or their daily earnings are specially invited to avail themselves of a resource whereby their surviving families may be secured from the evils of penury.

Pamphlets explanatory of the principles of Mutual Life Insurance, and illustrating its advantages, with forms of application, may be obtained at the office of the company, 35 Wall street, or of any of its agents.

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FARMERS! ATTENTION!!

John Mayher & Co's
NEW AGRICULTURAL WAREHOUSE
AND SEED STORE.

197 WATER STREET, NEW YORK.

Where they have for Sale, the largest and most complete assortment of Farming Implements, ever offered for sale in this city—all of which they will sell 10 per cent. Cheaper than the same kind of Goods can be bought at any other house in the city. Our Goods are all Warranted to give satisfaction.

FARMERS wanting to purchase, will please call and examine our Stock before buying elsewhere.

Among our assortment may be found the Celebrated Highest Premium Eagle Ploughs! together with all the most approved Ploughs now in use.

Also,—Horse Powers, Threshing Machines, Fan Mills, Corn Shellers, Straw Cutters, Corn Mills, Seed Sowers, Churns, Ox Yokes, Ox Scrapers, Hay Rakes, Horse Rakes, Patent Chain Pump (that never freezes nor rusts), and other Pumps; in fact we have everything for Farming Purposes—together with Guano, Bone Dust and other Fertilizers.

JOHN MAYHER & CO.,

197 Water st., N. Y.

February 9, 1850.

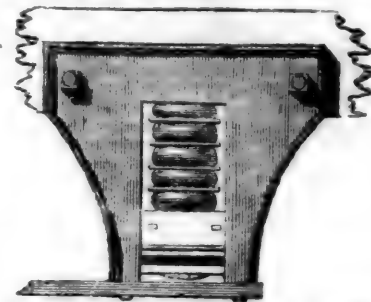
N.B.—J. M. & Co. also continue their Old Stand, at 195 Front street, near Fulton Market.

CAUTION.

RAILROAD COMPANIES and others are here-by cautioned against using or vending our improvement for easing the lateral motion as applied on Railroad Cars. Letters Patent having been granted to us in 1841, any party or parties so making or using said improvement without license from us will be proceeded against according to law.

DAVENPORT & BRIDGES.

FULLER'S PATENT INDIA RUBBER SPRING.



THESE SPRINGS ARE THE CHEAPEST, the lightest and most durable of any yet known. They are easily applied to new or old cars, and there is small possibility of any accident occurring to them.

Other parties through Mr. Ray set up claims to an India Rubber Spring which, though the same in principle, is very inferior in its working and durability. Actions are in progress for an Infringement on Fuller's Patent against parties using that Spring.

The superiority of Fuller's Spring over that claimed by Mr. Ray is fully established and has frequently been testified to. The following are from gentlemen who have had much experience with both Springs.

"It will afford me pleasure to recommend your springs to the companies in this region, in preference to Ray's which I am confident are inferior in mechanical arrangement to yours."

JOHN M'RAE,
Engineer S. Carolina R. R., Charleston.

"I do not hesitate to allow you to say that I concur in Mr. M' Rae's opinion that Ray's springs are inferior in mechanical arrangement to Fuller's. I repeatedly expressed that opinion long before Mr. M' Rae had seen your springs (as I believe) and entertain it still."

WM. PARKER,
Gen'l Supt. of Baltimore and Ohio R. R.

Office of Sup't Norwick & Worcester R.R. Co. }
December 26, 1849. }

"I most fully concur in the opinion of Jno. McRae, Engineer of S. Carolina Railroad, that 'Ray's Springs are inferior to Fuller's Springs;' and shall with pleasure recommend them to all Railroad Companies for adoption. I have used both springs on this road and have no hesitation in saying that I should in all cases prefer Fuller's Spring."

SAM'L H. P. LEE, JR.,
Supt. and Engineer.

Office B. & P. R. R. Co., }
Boston, 20th December, 1849. }

"This company have cars fitted up with both Ray's and Fuller's 'Metallic India Rubber Springs,' and I do not hesitate to say that Fuller's arrangement is very much superior to Ray's."

W. RAYMOND LEE, Supt.

The following result has been obtained by experiment upon one railroad.

A set of Trucks fitted with Steel Springs cost \$190.77 and weigh 2355 lbs. The same with Fuller's Springs,

131.71 " 1911 lbs.

Difference, \$59.06 " 444 lbs.

Not only is there an advantage in the cost, but owing to the great reduction in weight, the car can be made lighter throughout, and so an enormous saving in weight may be effected in a Train.

G. M. KNEVITT, 38 Broadway, N. Y.,
General Agent for the U. S.

The Springs can also be had of
JAMES LEE & CO., 18 India Wharf, Boston, &
JAS. THORNLEY, 110 Chestnut St., Philad.
January 2, 1850.

WHISTLER MONUMENT Association.

MAJOR T. S. BROWN having, in leaving this country, resigned his office as Treasurer of this Association, the Committee appointed for that purpose have selected as his successor GEO. M. DEXTER, Esq., of Boston.

Those desiring to subscribe will therefore please direct their communications to Geo. M. Dexter, Civil Engineer, etc., Boston, Mass.

A. W. CRAVEN, Secretary, etc.
New York, February 22, 1850.

To the Proprietors of Rolling Mills and Iron Works.

THE Undersigned—Proprietors of Townsend's Furnace and Machine Shop, Albany—are extensively engaged in the manufacture of Machinery and fixtures for Iron, and Copper Rolling Mills, and Iron Works. Having paid particular attention to the manufacture of *Rolls* (Rollers), both *chilled* and *dry-sand*, they feel confident that they can execute orders for such castings in a satisfactory manner. And to give assurance of this, they beg leave to refer to the following named persons, proprietors and managers of some of the most extensive rolling mills in the country, viz: Jno. F. Winslow, J. Tuckerman, H. Burden, W. Burtt, J. & J. Rogers, Saltus & Co., J. B. Bailey, L. G. B. Cannon, Hawkins & Atwater, etc., etc.

F. & T. TOWNSEND.

Albany, August 18, 1849.

Arch St. Machine Shop.
BIRKENBINE, MARTIN & TROTTER,
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STEAM ENGINES,

and

HYDRAULIC MACHINERY,
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Will construct Steam Engines, Pumps, for Draining Mines and Land; supplying Water to Towns, Factories, Farms, etc;

Also, Street Stops, Fire Plugs, Water Tanks, and Hydraulic Rams, with

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B., M. & T. contract for Warming and Ventilating Buildings by Steam or Warm Water.

THE NEWCASTLE MANUFACTURING Co. continue to furnish at the Works, situated in the town of Newcastle, Del., Locomotive and other steam engines, Jack Screws, Wrought Iron Work and Brass and Iron Castings, of all kinds connected with Steamboats, Railroads, etc.; Mill Gearing of every description; Cast Wheels (chilled) of any pattern and size, with Axles fitted, also with wrought tires, Springs, Boxes and bolts for Cars; Driving and other wheels for Locomotives.

The works being on an extensive scale, all orders will be executed with promptness and despatch. Communications addressed to Mr. William H. Dobbs, Superintendent, will meet with immediate attention.

ANDREW C. GRAY,
President of the Newcastle Manuf. Co.

Brown's Old Established SCALE WARE HOUSE,
NO. 234 WATER ST., NEW YORK.

THE Subscriber, Practical Manufacturer of Scales of every description, respectfully asks the attention of Railroad Companies to his Improved Wrought Iron Railroad Track and Depot Scales which for strength, durability, accuracy, convenience in weighing, and beauty of workmanship, are not surpassed by any others in this country.

He is aware that this is rather a bold assertion for him to make, yet he can say with confidence that they have but to be tried to give them precedence over all others.

J. L. BROWN.
Bank Scales made to order, and all Scales of his make Warranted in every particular.
References given if required. 4tf

ENGINEERS.

Bancks, C. W.,
Civil Engineer, Vicksburg, Miss.

Berrien, John M.,
Michigan Central Railroad, Marshall, Mich.

Buckland, George,
Troy and Greenbush Railroad.

Clement, Wm. H.,
Little Miami Railroad, Cincinnati, Ohio.

Cozzens, W. H.,
Engineer and Surveyor, St. Louis, Mo.

Davidson, M. O.,
Eckhart Mines, Alleghany Co., Maryland.

Fisk, Charles B.,
Cumberland and Ohio Canal, Washington, D. C.

Felton, S. M.,
Fitchburg Railroad, Boston, Mass.

Floyd-Jones, Charles,
South Oyster Bay, L. I.

Gzowski, Mr.,
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Gilbert, Wm. B.,
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Grant, James H.,
Nashville and Chattanooga R. R., Nashville, Tenn.

Harry, P.,
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Baltimore and Ohio Railroad, Baltimore, Md.

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Morris, Elwood,
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Morton, A. C.,
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McRae, John,
South Carolina Railroad, Charleston, S. C.

Nott, Samuel,
Lawrence and Manchester Railroad, Boston,

Prichard, M. B.,
East Tennessee and Georgia R. R., Cleveland, Tenn.

Roebbling, John A.,
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Roberts, Solomon W.,
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Sanford, C. O.,
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Schlatter, Charles L.,
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Sours, Peter,
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Trimble, Isaac R.,
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Whipple, S.,
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Williams, E. P.,
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On the European Plan,
NO. 135 FULTON STREET,
Between Broadway and Nassau St.,
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For the Purchase and Sale of Railroad Iron (new and old), Boiler Plates, Pig and Bar Iron, Lead, Tin, Copper, Spelter, etc. Refers to
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" Grinnell, Minturn & Co., "
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" Earps & Brink, Philadelphia.
" E. Pratt & Brother, Baltimore.
John Barstow, Esq., Providence.
Lewis Bullard, Esq., Boston.
February 9, 1850. 6m*

VanRensselaer Stevens,
Sup't Transportation Providence and Worcester R.R., Providence, R.I. Has had 13 years' experience in Operating Railroads. Will go South or West if applied to.

J. & Riley Carr,
Manufacturers of Cast, Shear, German and Blister
STEEL,
Of all Descriptions, Warranted Good.
BAILEY-LANE WORKS, SHEFFIELD.

R. S. DENTON, Agent,
NO. 20 CLIFF ST., NEW YORK.

STEEL AND FILES.

R. S. Denton,
20 CLIFF STREET, NEW YORK,

AGENT FOR
J. & Riley Carr's
BAILEY-LANE WORKS, SHEFFIELD,
Manufacturers of Cast, Shear, German and Blister
STEEL

Of all descriptions. Warranted Good
FILES.

Manufacturers of Machinists' Warranted Best Cast Steel Files, expressly for working upon Iron and Steel, made very heavy for recutting.
A full Stock of Steel and Files at all times on hand. 6m4

Cumberland, (Md.) Coals for Steaming, etc.
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by J. COWLES, 37 Wall St., N. Y.

George O. Robertson,
BROKER IN SCOTCH AND
AMERICAN PIG IRON;
Bar Iron, Lead, Spelter, Tin, Copper, etc.,
No. 4 Liberty Place, MAIDEN LANE,
(Near Broadway.)
NEW YORK

Manufacture of Patent Wire ROPE AND CABLES,
For Inclined Planes, Suspension Bridges, Standing Rigging, Mines, Cranes, Derrick, Tillers, &c., by
JOHN A. ROEBLING, Civil Engineer,
TRENTON, N. J.

Samuel D. Willmott,
MERCHANT, AND MANUFACTURER OF
CAST STEEL WARRANTED SAWS,
IMPORTER OF THE
GENUINE WICKESLY GRINDSTONES
NO. 8 LIBERTY STREET,
NEW YORK.

Doremus & Harris,
ANALYTICAL & CONSULTING CHEMISTS,
179 BROADWAY, NEW YORK.
SCHOOL OF CHEMISTRY.

Dudley B. Fuller & Co.,
IRON COMMISSION MERCHANTS,
No. 139 GREENWICH STREET,
NEW YORK.

Manning & Lee,
GENERAL COMMISSION MERCHANTS,
NO. 51 EXCHANGE PLACE,
BALTIMORE.
Agents for Avalon Railroad Iron and Nail Works.
Maryland Mining Company's Cumberland Coal 'CED'
—'Potomac' and other good brands of Pig Iron.

**Railroad Car Manufacturer's
Furnishing Store.****F. S. & S. A. MARTINE,**

IMPORTERS AND MANUFACTURERS OF

**RAIL ROAD CAR &
CARRIAGE LININGS,**PLUSHES, CURTAIN MATERIALS, ETC.,
112 WILLIAM ST., NEAR JOHN.3-4 and 6-4 Damasks, Union and Worsted; Mo-
reens, Rattinets, Cloths, Silk and Cotton Velvets,
English Bunting**S. W. Hill,**Mining Engineer and Surveyor, Eagle River,
Lake Superior.**Alfred W. Craven,**

Chief Engineer Croton Aqueduct, New York.

Starks & Pruyn,MANUFACTURERS OF ALL KINDS OF
STEAM BOILERS,

52 and 54 Liberty, corner of Pruyn street

Nathan Starks, **ALBANY** Special Partner
Wm. F. Pruyn, R. H. Pruyn.
Iron Railing, Bank and Vault Doors, Iron Shutters
Bridge and Roof Bolts, Heavy Jobbing and Forging
of all kinds.

For particulars see Adv. in another column.

To Engineers and Surveyors.E. BROWN AND SON Mathematical inst. mak-
ers No. 27 Fulton Slip, New York, make and keep
for sale, Theodolites, Levelling inst., Levelling rods,
Surveyors Compasses, and Chains, Cases of Mathe-
matical drawing insts. various qualities, together with
a general assortment of Ivory Scales and small insts.
generally used by Engineers.**Samuel Kimber & Co.,****COMMISSION MERCHANTS**

WILLOW ST. WHARVES, PHILADELPHIA.

A Pig Iron, Hammered Railroad Car and Locomo-
tive Axles, Force Pumps of the most approved con-
struction for Railroad Water Stations and Hydraulic
Rams, etc., etc.
July, 27, 1849.**James Herron, Civil Engineer,**OF THE UNITED STATES NAVY YARD,
PENSACOLA, FLORIDA.,

PATENTEE OF THE

HERRON RAILWAY TRACK.Models of this Track, on the most improved plans,
may be seen at the Engineer's office of the New York
and Erie Railroad.**To Railroad Companies.****—WROUGHT IRON WHEELS—**

SAFETY AND ECONOMY.

**NORRIS LOCOMOTIVE WORKS,
SCHENECTADY, NEW YORK,**Are Manufacturing Wrought Iron Driving, Truck,
Tender, and Car Wheels—made from the best Ameri-
can Iron. Address **E. S. NORRIS.**
May 16, 1849.**Machinery Warehouse.**S. C. HILLS, No. 43 Fulton street, New York, has
constantly for sale Steam Engines, Boilers, Lathes,
Chucks, Drills, Planers, Force and Suction Pumps;
Tenoning, Morticing and Boring Machines, Shingle
Machines, Bolt and Nut Machines, Belting, Oil, Iron
and Lead Pipe; Rubber, Percha and Leather Hose,
&c., &c.S. C. H.'s arrangements with several machine shops
are such that he can supply, at very short notice, large
quantities of machinery.

November 23, 1849.

Cruse & Burke,**Civil Engineers, Architects and Surveyors,**
Office, New York State Institution of Civil Engineers,
STATE HALL, ALBANY., N. Y.Drawings, specifications and surveys accurately ex-
ecuted. Pupils instructed theoretically and practical-
ly at a moderate premium.

May 26, 1849.

Eaton, Gilbert & Co.,
Railroad Car, Coach and Omnibus Builders,
TROY, N. Y.**Hudson River Foundry,
THOMAS & COLLINS,**

130 Quay Street, Albany.

To Railroad & Navigation Cos.Mr. M. BUTT HEWSON, Civil Engineer, offers his
services to Companies about to carry out the surveys
or works of a line of Navigation or Railroad. He can
give satisfactory references in New York City as to his
professional qualifications; and will therefore merely
refer here to the fact of his having been engaged for
upwards of two years conducting important Public
Works or the British Government.Communications will find Mr. Hewson at the office
of the Railroad Journal, 54 Wall Street, New York.**Walter R. Johnson,**CIVIL AND MINING ENGINEER AND AT-
torney for Patents. Office and Laboratory, F St.,
opposite the Patent office, Washington, D. C.**Cop Waste.****CLEAN COP WASTE**, suitable for cleaning Rail-
road Steamboat and Stationary Engines, con-
stantly on hand and for sale by**KENNEDY & GELSTON,**
54 Pine St., New York.

October 27, 1849,

3m

Ranstead, Dearborn & Co.,

MANUFACTURERS OF

LOCOMOTIVE CRANKS AND CAR AXLES,

ALSO

WROUGHT IRON SHAFTING,

And All Kinds of Hammered Shapes.

Forge at Commercial Point, Dorchester,
Office 25 Foster's Wharf, opposite No. 211 Broad St.**BOSTON.****IRON.****Iron.**Pig Iron, Anthracite and Charcoal; Boiler and Flue
Iron, Spring and Blistered Steel, Nail Rods, Best Re-
fined Bar Iron, Railroad Iron, Car Axles, Nails, Stove
Castings, Cast Iron Pipes of all sizes, Railway Chairs
of approved patterns for sale by**COLEMAN, KELTON & CABELL,**
109 N. Water St., Philadelphia.**IRONDALE PIG METAL, MANUFACTURED**and for sale by the Bloomsburg Railroad Iron Co.
DUDLEY FISHER, Treasurer.
75 N. Water St., Philadelphia.**Railroad Iron.****500** Tons, afloat, weighing 57 pounds per lineal
yard, for sale by
COLLINS, VOSE & CO.,
158 South St.

New York, November 17, 1849.

1m46

Railroad Iron.**1675** Tons, weighing about 61 lbs. per yard, 90
tons, weighing about 52 lbs. per yard, and
825 tons, weighing about 534 lbs. per yard, of the lat-
est and most approved patterns of T rail, for sale by
BOORMAN, JOHNSTON & CO.,
119 Greenwich street.

New York, Feb. 25, 1850.

N.B.—B., J. & Co are also prepared to take con-
tracts for English rails, delivered in any of the Atlan-
tic ports of the United States.**Railroad Iron.****THE UNDERSIGNED, HAVING** made arrange-
ments abroad, are prepared to contract for the de-
livery of Foreign rails, of approved brands upon the
most favorable terms.They will also make contracts for American rails,
made at their Trenton works, from Andover Iron, in
whole or in part, as may be agreed upon.They are prepared to furnish Telegraph, Spring and
Market Wire; Braziers and Wire Rods; Rivets and
Merchant Bars to order, all made exclusively from An-
dover Iron. The attention of parties who require iron
of the very best quality for special purposes, is respect-
fully invited.**COOPER & HEWITT,**
17 Burling Slip, New York.

February 15, 1850.

Glendon Refined Iron.Round Iron, Band Iron, Hoop Iron,
Square " Flat " Scroll "

Axles, Locomotive Tyres,

Manufactured at the Glendon Mills, East Boston, for
sale by **GEORGE GARDNER & CO.,**

5 Liberty Square, Boston, Mass.

Sept. 15, 1849.

3m37

**PATENT HAMMERED RAILROAD, SHIP &
BOAT SPIKES.**—The Albany Iron Works
have always on hand, of their own manufacture, a
large assortment of Railroad, Ship and Boat Spikes
from 2 to 12 inches in length, and of any form of head;
From the excellence of the material always used in
their manufacture, and their very general use for rail-
roads and other purposes in this country, the manu-
facturers have no hesitation in warranting them fully
equal to the best spikes in market, both as to quality
and appearance. All orders addressed to the subscrib-
ers at the works will be promptly executed.**JOHN F. WINSLOW, Agent.**

Albany Iron and Nail Works, Troy, N. Y.

The above Spikes may be had at future prices, of
Erastus Corning & Co Albany; Merritt & Co., New
York; E. Pratt & Brother, Baltimore Md**LAP—WELDED
WROUGHT IRON TUBES**

FOR

TUBULAR BOILERS,

FROM 1 1/2 TO 8 INCHES DIAMETER.

These are the ONLY Tubes of the same quality
and manufacture as those so extensively used in
England, Scotland, France and Germany, for Lo-
comotive, Marine and other Steam Engine Boilers**THOMAS PROSSER,**

Patentee.

28 Platt street, New York.

Railroad Iron.**THE UNDERSIGNED ARE PREPARED TO**
contract for the delivery of English Railroad Iron
of favorite brands, during the Spring. They also re-
ceive orders for the importation of Pig, Bar, Sheet, etc.
Iron.**THOMAS B. SANDS & CO.,**

22 South William street,

February 3, 1849.

New York.

Iron Store.**THE** Subscribers, having the selling agency of the
following named Rolling Mills, viz: Norristown,
Rough and Ready, Kensington, Triadelphia, Potts-
grove and Thorndale, can supply Railroad Companies,
Merchants and others, at the wholesale mill prices for
bars of all sizes, sheets cut to order as large as 58 in.
diameter; Railroad Iron, domestic and foreign; Loco-
motive tire welded to given size; Chains and Spikes;
Iron for shafting, locomotive and general machinery
purposes; Cast, Shear, Blister and Spring Steel; Boil-
er rivets; Copper; Pig iron, etc., etc.**MORRIS, JONES & CO.,**

Iron Merchants,

Schuylkill 7th and Market Sts., Philadelphia.

August 16, 1849.

1y33

Railroad Iron.**THE MOUNT SAVAGE IRON WORKS, AL-**
legany county, Maryland, having recently pass-
ed into the hands of new proprietors, are now prepar-
ed, with increased facilities, to execute orders for any
of the various patterns of Railroad Iron. Communi-
cations addressed to either of the subscribers will have
prompt attention. **J. F. WINSLOW, President**

Troy, N. Y.

ERASTUS CORNING, Albany**WARREN DELANO, Jr., N. Y.****JOHN M. FORBES, Boston.****ENOCH PRATT, Baltimore, Md.**

November 6, 1848.

Railroad Iron.**THE SUBSCRIBERS ARE PREPARED TO**
take orders for Railroad Iron to be made at their
Phoenix Iron Works, situated on the Schuylkill Riv-
er, near this city, and at their Safe Harbor Iron Works,
situated in Lancaster County, on the Susquehanna
river; which two establishments are now turning out
upwards of 1800 tons of finished rails per month.Companies desirous of contracting will be promptly
supplied with rails of any required pattern, and of the
very best quality.**REEVES, BUCK & CO.,**

45 North Water St., Philadelphia.

March 15, 1849.

Monument Foundry.

A. & W. DENMEAD & SON,
Corner of North and Monument Sts.,—Baltimore,

HAVING THEIR

IRON FOUNDRY AND MACHINE SHOP

In complete operation, are prepared to execute faithfully and promptly, orders for Locomotive or Stationary Steam Engines, Woolen, Cotton, Flour, Rice, Sugar Grist, or Saw Mills.

Slide, Hand or Chuck Lathes, Machinery for cutting all kinds of Gearing. Hydraulic, Tobacco and other Presses, Car and Locomotive patent Ring Wheels, warranted,

Bridge and Mill Castings of every description, Gas and Water Pipes of all sizes, warranted, Railroad Wheels with best faggotted axle, furnished and fitted up for use, complete

Being provided with Heavy Lathes for Boring and Turning Screws, Cylinders, etc., we can furnish them of any pitch, length or pattern.

Old Machinery Renewed or Repaired—and Estimates for Work in any part of the United States furnished at short notice.

June 8, 1849.

Iron Wire.

REFINED IRON WIRE OF ALL KINDS.
Card, Reed, Cotton-flyer, Annealed, Broom, Buckle, and Spring Wire. Also all kinds of Round, Flat or Oval Wire, best adapted to various machine purposes, annealed and tempered, straightened and cut any length, manufactured and sold by

ICHABOD WASHBURN.

Worcester, Mass., May 25, 1849.

American and Foreign Iron.

FOR SALE,

300 Tons A 1, Iron Dale Foundry Iron.
100 " 1, " " "
100 " 2, " " "
100 " " Forge " "
400 " Wilkesbarre " "
100 " "Roaring Run" Foundry Iron.
300 " Fort " "
50 " Catocin " "
250 " Chikiswalongo " "
50 " "Columbia" "chilling" iron, a very superior article for car wheels.
75 " "Columbia" refined boiler blooms.
30 " 1 x 1/2 Slit Iron.
50 " Best Penna. boiler iron.
50 " "Puddled" " "
50 " Bagnall & Sons refined bar iron.
50 " Common bar iron.

Locomotive and other boiler iron furnished to order,
GOODHUE & CO.,
New York. 64 South street

American Pig, Bloom and Boiler Iron.

HENRY THOMPSON & SON,
No 57 South Gay St., Baltimore, Md.,
Offer for sale, Hot Blast Charcoal Pig Iron made at the Catocin (Maryland), and Taylor (Virginia), Furnaces; Cold Blast Charcoal Pig Iron from the Cloverdale and Catawba, Va., Furnaces, suitable for Wheels or Machinery requiring extra strength; also Boiler and Flue Iron from the mills of Edge & Hilles in Delaware, and best quality Boiler Blooms made from Cold Blast Pig Iron at the Shenandoah Works, Va. The productions of the above establishments can always be had at the lowest market price, for approved paper.
American Pig Iron of other brands, and Rolled and Hammered Bar Iron furnished at lowest prices. Agents for Watson's Perth Amboy Fire Bricks; and Rich & Cos. New York Salamander Iron Chests.
Baltimore, June 14, 1849. 6 mos

Wheel, Forge and Foundry Iron.

LOCUST GROVE Wheel Iron of great strength and superior chilling property.
Balt. Charcoal Forge Iron, from Patuxent, Curtis Creek and Gunpowder furnaces.

Elkridge Foundry Iron, of superior strength and softness. Anthracite and Charcoal Iron from Pennsylvania and Virginia. Gas and Water Pipes, Lamp Posts from Elkridge Furnace.

LEMMON & GLENN,
6m9 62 Buchanan's Wharf, Baltimore.

Iron.

THE SUBSCRIBERS having resumed the agency of the New-Jersey Iron Company, are prepared to execute orders for the different kinds and sizes of iron usually made at the works of the company, and offer for sale on advantageous terms.—

150 tons No. 1 Boonton Foundry Pig Iron.
100 " No. 2 do. do.
300 " Nos. 2 & 3 Forge do. do.
100 " No. 2 Glendon do. do.
140 " Nos. 2 & 3 Lehigh Crane do do.
100 " No. 1 Pompton Charcoal do.
100 " New-Jersey Blooms
50 " New-Jersey Faggotted Iron, for shafts
Best Bars, 1/2 to 4 inch by 1/2 to 1 inch thick.
Do do Rounds and Squares, 1/2 to 3 inch.
Rounds and Squares, 3-16 to 1 inch.
Half Rounds, 1/2 to 1 in. Ovals & Half Ovals 1/2 to 1 1/2 in.
Bands, 1 1/2 to 4 inch. Hoops, 1/2 to 2 inch.
Trunk Hoops, 1/2 to 1 1/2 in. Horse Shoe & Nut Iron.
Nail Plates. Railroad Spikes.

DUDLEY B. FULLER & Co., 139 Greenwich-st. and 85 Broad-st.

WILLIAM JESSOP & SONS' CELEBRATED CAST-STEEL.

The subscribers have on hand, and are constantly receiving from their manufactory,

PARK WORKS, SHEFFIELD,
Double Refined Cast Steel—square, flat and octagon. Best warranted Cast Steel—square, flat and octagon. Best double and single Shear Steel—warranted. Machinery Steel—round.

Best and 2d gy. Sheet Steel—for saws and other purposes.

German Steel—flat and square, "W. I. & S." "Eagle" and "Goat" stamps.

Genuine "Sykes," L Blister Steel. Best English Blister Steel, etc., etc., etc.

All of which are offered for sale on the most favorable terms by
WM. JESSOP & SONS,
91 John street, New York.

Also by their Agents—

Curtis & Hand, 47 Commerce street, Philadelphia.
Alex'r Fullerton & Co., 119 Milk street, Boston.
Stickney & Beatty, South Charles street, Baltimore.
May 6, 1848.

Ogden & Martin's ROSENDALE CEMENT.

WE are prepared to enter into arrangements for supplying our Cement for public works or other purposes. We warrant the cement equal in every respect to any manufactured in this country. It attains a great degree of hardness, sets immediately under water, and is a superior article for masonry coming in contact with water, or requiring great strength.

For sale in tight barrels, well papered, at their office by
OGDEN & MARTIN, 104 Wall st.
February 16, 1850. 1y*

The above cement is used in most of the fortifications building by government.

JOHNSON, CAMMELL & Co's Celebrated Cast Steel,

AND
ENGINEERING AND MACHINE FILES,
which for quality and adaptation to mechanical uses, have been proved superior to any in the United States. Every description of square, octagon, flat and round cast steel, sheet, shovel and railway spring steel, best double and single shear steel, German steel, flat and square, goat stamps, etc. Saw and file steel, and steel to order for any purposes, manufactured at their Cyclops Steel Works Sheffield.

JOHNSON, CAMMELL & CO.,
100 William St., New York.

November 23 1849.

Railroad Iron.

1,500 Tons weighing 59 lbs. per lineal yard.
500 " " 57 " "
500 " " 56 " "
500 " " 60 & 61 lbs. "

Also 24x1/2 flat rails. All the above being of approved patterns. For sale by

DAVIS, BROOKS, & CO.,
68 Broad street.

N.B.—Rails imported on commission, or at a fixed price.

CUT NAILS OF BEST QUALITY, BAR IRON
(including Flat Rails) manufactured and for sale by
FISHER, MORGAN & CO.,
75 N. Water St., Philadelphia.

American Cast Steel.

THE ADIRONDAC STEEL MANUFACTURING CO. is now producing, from American iron, at their works at Jersey City, N.J., Cast Steel of extraordinary quality, and is prepared to supply orders for the same at prices below that of the imported article of like quality. Consumers will find it to their interest to give this a trial. Orders for all sizes of hammered cast steel, directed as above, will meet with prompt attention.

May 28, 1849.

To Steam Engine Builders.

THE Undersigned offer for sale, at less than half its cost, the following new machinery, calculated for an engine of 62 inches cylinder and 10 feet stroke, viz.

2 Wrought Iron Cranks, 60 inches from centre to centre.

1 Do. do. Connecting Rod Strap.

2 Do. do. Crank Pins.

1 Eccentric Strap.

1 Diagonal Link with Brasses.

1 Cast Iron Lever Beam (forked).

The above machinery was made at the West Point Foundry for the U. S. Steamer Missouri, without regard to expense, is all finished complete for putting together, and has never been used. Drawings of the cranks can be seen on application to

HENRY THOMPSON & SON

No. 57 South Gay St., Baltimore, Md.
Sept. 12, 1849.

Railroad Instruments.

THEODOLITES, TRANSIT COMPASSES, and Levels, with Fraunhoffer's Munich Glasses, Surveyor's Compasses, Chains, Drawing Instruments, Barometers, etc., all of the best quality and workmanship, for sale at unusually low prices, by

E. & G. W. BLUNT.

No. 179 Water St., cor. Burling Slip.
New York, May 19, 1849.

Ballard's Improved JACK-SCREW.

PATENTED.

THE ADVANTAGES OF THIS Screw for Stone Quarries, Railroads, Steam Boiler Builders, and for other purposes are superior to any other similar machine.

The improvement consists in being able to use either end of the screw, as occasion requires.

It is capable of raising the heaviest Locomotive with ease, being portable, strong and powerful, and not likely to get out of order.

Many Railroad Companies and Boiler Makers have them in use—by whom they are highly recommended.

JACK SCREWS, of various sizes, power and price, constantly on hand at the manufactory.

No. 7 Eldridge Street,
near Division Street.
New York, Jan. 19, 1850.

To Railroad Companies and Contractors.

FOR SALE.—Two Locomotive Engines and Tenders, at present in use on the Beaver Meadow Railroad, being too light for their coal trains, but well calculated for either gravel or light passenger trains.

They weigh, in running order, about 8 tons each—having one pair of driving wheels 4 feet diameter, 4 truck wheels 30 inches diameter, with cylinders 10 in. diameter, and 13 inches stroke of piston. Tenders on 4 wheels. Address **JAMES ROWLAND,**
Prest. Beaver Meadow Railroad & Coal Co., Philadelphia.

or, **L. CHAMBERLAIN, Sec'y,**
at Beaver Meadow, Pa.
May 19, 1849. 20ff

SPRING STEEL FOR LOCOMOTIVES, TENDERS AND CARS.—The subscriber is engaged in manufacturing spring steel from 1 1/2 to 6 inches in width, and of any thickness required: large quantities are yearly furnished for railroad purposes, and wherever used its quality has been approved of. The establishment being large, can execute orders with great promptitude, at reasonable prices, and the quality warranted. Address **J. F. WINSLOW, Agent,**
Albany Iron and Nail Works.

To Railroad Companies.

FOR SALE—A Second-hand Locomotive Engine and Tender, of about 10 tons weight, in good order, and warranted to perform well. Any company wanting a cheap engine for a passenger or light burden train, will rarely meet with an opportunity so favorable as the present. The engine and tender are in perfect running order, and will be tested to the satisfaction of any one wishing to purchase. Price \$1,500.

Address **J. B. MOORHEAD,**
Frazer P.O., Chester county, Pa.

P.S.—The Engine can be seen by calling on H. Osmond & Co., Car-builders, Broad st., Philadelphia.
September 6, 1849.

India-rubber for Railroad Cos.

RUBBER SPRINGS—Bearing and Buffer—Fuller's Patent—Hose from 1 to 12 inches diameter. Suction Hose. Steam Packing—from 1-16 to 2 in. thick. Rubber and Gutta Percha Bands. These articles are all warranted to give satisfaction, made under Tyer & Helm's patent, issued January, 1849.—No lead used in the composition. Will stand much higher heat than that called "Goodyear's," and is in all respects better than any in use. Proprietors of railroads do not be overcharged by pretenders.

HORACE H. DAY,
Warehouse 23 Courtlandt street.

New York, May 21, 1849.

Fire Brick.

THE Subscribers have constantly on hand Rafford's Stourbridge, Oak Farms Stourbridge, Lister, Wortley, Red and White Welsh Fire Bricks, common and fancy shapes. Also,

ROOFING SLATES,
from the best Welch quarries, and of all sizes. Also, **COAL,**

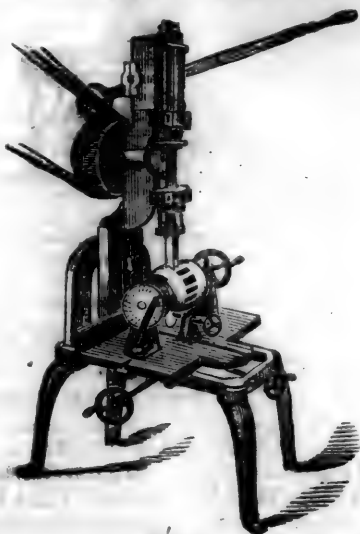
of all kinds—Liverpool Orrell and Cannel, Scotch, New Castle, Pictou, Sidney, Cumberland, Virginia, and all kinds of Anthracite coals. Also,

Pig Iron, Salt, etc., etc., for sale at the lowest market price. Apply to

SAMUEL THOMPSON & NEPHEW,
275 Pearl and 43 Gold Sts., New York.

November, 23, 1849.

**Capt. Alfred Swingle's
PATENT BORING
& MORTISING MACHINE.**



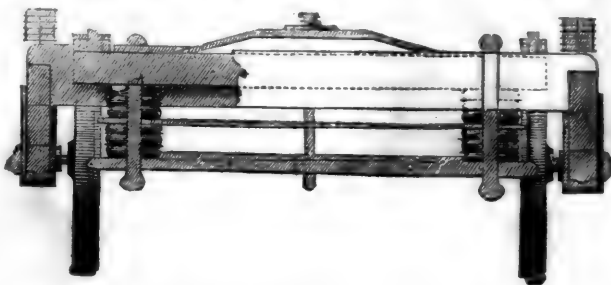
The above Machine was invented by A. SWINGLE, of Texas, in 1846, and Letters Patent were taken out in July, 1848. "As a labor saving Machine it stands unrivalled even in these days of improvements. Its uses are innumerable; it may be successfully applied to Doors, Sashes, Carriages, Wheel-Hubs, and in fact to all kinds of work where the Auger and Chisel can be brought to bear.

The only limit to the speed of the working of this machine is the heating of the tools used. It will perform at least the labor of twelve men, and in vastly better manner, and can be worked equally well by steam power or by hand. It has been used and has given universal satisfaction.

For further information apply to H. B. THRENTS, 40 Wall St., New York, to whom all orders are to be addressed.

New York, December 15, 1849.

**FULLER'S PATENT
INDIA RUBBER CAR SPRINGS.**



RAILROAD COMPANIES are cautioned, before purchasing Springs, to examine the actual patents and judge for themselves.

Persons, under the Title of the New England Car Company, seeking fraudulently to invade Fuller's rights have put forth so many statements for the purpose of misleading the public, that an enumeration of some facts is absolutely necessary, for the purpose of putting persons interested upon their guard.

Fuller's patent is for the application of Discs of India-rubber with Metal Plates, for forming Springs for Railway Cars and Carriages—either one disc and two plates, or ten discs and plates, or any other number, are equally covered by the patent. Fuller is not bound to the use of short discs—he may use long discs and plates.

Ray's patent is simply and wholly the forming of air tight rubber cylinders, with hoops or bands round the outside, and the combination of elasticity of India rubber, with the elasticity of atmospheric air confined in the cylinder, and in no part of his patent is he authorized to use the form of spring which he is now fraudulently supplying to Railroad Companies. Such springs are direct and positive infringements of the very letter of Fuller's patent.

Fuller's patent is dated October, 1845, Ray's patent, August, 1848.

The spring patented by Ray never has been put in operation, and never can be made useful for Railroad cars.

A mere experiment, even if made, it is well known does not prove an invention; and it is ridiculous for such parties to hope to mislead the Presidents and Superintendents of Railroad companies, by claiming the invention because Ray alleges he made an experiment—which Fuller had made before him—had actually brought into working order, and obtained a patent for—and this too before Mr. Ray states he made his experiment—and that experiment not claimed to have been applied to a car or carriage.

Besides, the invention could not have been developed until India rubber, properly Vulcanised, could be made of a sufficient thickness. In the United States the art of vulcanising rubber by steam heat, (by which

means only can a body of rubber having any considerable thickness be vulcanised,) was not introduced until after the grant by the American government of the patent for springs to Fuller—whereas the process of vulcanising rubber by steam heat was invented in England about three years previously, and was used by Fuller there. This fact refutes entirely the claim of invention put forth by Mr. Ray, and proves the impossibility of his pretensions being true.

Fuller was the first and only inventor of the spring. A Mr. Dorr, whose connection with Mr. Goodyear is well known in this country, applied in England to Mr. Fuller, after he had published and patented his invention, and introduced another party for the purpose of obtaining the agency for the United States. They were furnished with a complete set of drawings and models, and with instructions to make arrangements for the supply of material of American manufacture—from that hour to the present not a single communication has been received from them. Some of these identical models have been traced into the hands of parties now seeking to invade Fuller's rights, and who have exhibited them as specimens of their own invention.

After this, the conveyance was made by Goodyear to certain parties here for the use for railroad springs of what he calls his Metallic rubber. Comment is unnecessary.

There are 5 or 6 different processes for the manufacture of vulcanised rubber, patented by many different parties, some here, some in England, either of which would probably make good springs.

A large and powerful company has been organized under Fuller's patent, the particulars of which shall be given very shortly.

An action has been commenced against three railroad companies for infringement; and all other parties will assuredly be prosecuted if they continue further to infringe upon Fuller's patent.

W. C. FULLER,

The only persons authorized to supply the Springs are **G. M. KNEVITT**, 38 Broadway, N. York,
General Agent for the U. S.; and
JAS. LEE & Co., 18 India Wharf, Boston.
JOHN THORNLEY, Chestnut st., Philad.

**Patent India Rubber Steam
Packing.**

THIS article, made by the subscriber, who alone is authorized to make it, is warranted to stand as high a degree of heat as any that has been or can be made by any person—and is the article which has made the reputation of India Rubber Steam Packing and the demand therefor. A large assortment of all thicknesses requisite for any description of engines, steam pipes, valves, etc., constantly on hand and for sale by the manufacturer and patentee, who will give every information regarding its properties, mode of use, etc. at the warehouse.

JOHN GREACHEN, JR.,
98 Broadway, opposite Trinity Church.
New York, October, 1849.

**Ibbotson, Brothers & Co's
CELEBRATED CAST STEEL**

AND
Best Cast Steel Royal Improved Files, well known as better adapted for Engineers' and Machinists' purposes than any now in use in the United States.

Every description of Square, Octagon, Flat and Round Cast Steel, Sheet, Shovel and Railway Spring Steel, etc., and Steel to order for any purpose—manufactured at their works in Sheffield—and universally known by the old stamp "Globe."

HENRY J. IBBOTSON, Agent,
218 Pearl st., New York.

February 25, 1850.

FAIRBANKS' RAILROAD SCALES.—THE subscribers are prepared to construct at short notice, Railroad and Depot Scales, of any desired length and capacity. Their long experience as manufacturers—their improvements in the construction of the various modifications, having reference to strength, durability, retention of adjustment, accuracy of weight and dispatch in weighing—and the long and severe tests to which their scales have been subjected—combine to ensure for these scales the universal confidence of the public.

No other scales are so extensively used upon railroads, either in the United States or Great Britain;—and the managers refer with confidence to the following in the United States.

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Balt. and Ohio Railroad.
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And other principal Railroads in the Western, Middle and Southern States.

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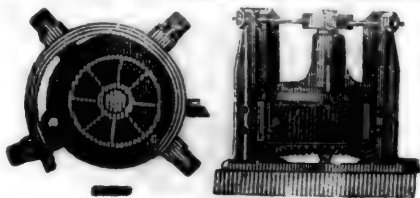
Agents, } **FAIRBANKS & Co.** 81 Water St., N. York.
 } **A. B. NORRIS**, 196 Market St. Philadelphia.

April 22, 1849.

17-47

MACHINERY.

Henry Burden's Patent Revolving Shingling Machine.



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This machine is now in successful operation in ten or twelve iron works in and about the vicinity of Pittsburgh, also at Phoenixville and Reading, Pa., Covington Iron Works, Md., Troy Rolling Mills, and Troy Iron and Nail Factory, Troy, N. Y., where it has given universal satisfaction.

Its advantages over the ordinary Forge Hammer are numerous: considerable saving in first cost; saving in power; the entire saving of shingler's, or hammerman's wages, as no attendance whatever is necessary, it being entirely self-acting; saving in time from the quantity of work done, as one machine is capable of working the iron from sixty puddling furnaces; saving of waste, as nothing but the scoria is thrown off, and that most effectually; saving of staffs, as none are used or required. The time required to furnish a bloom being only about six seconds, the scoria has no time to set, consequently is got rid of much easier than when allowed to congeal as under the hammer. The iron being discharged from the machine so hot, rolls better and is much easier on the rollers and machinery. The bars roll sounder, and are much better finished. The subscriber feels confident that persons who will examine for themselves the machinery in operation, will find it possesses more advantages than have been enumerated. For further particulars address the subscriber at Troy, N. Y. P. A. BURDEN.

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THE TROY IRON AND NAIL FACTORY, exclusive owner of all Henry Burden's Patented Machinery for making Spikes, have facilities for manufacturing large quantities upon short notice, and of a quality unsurpassed.

Wrought-Iron Chairs, Clamps, Keys and Bolts for Railroad fastenings, also made to order. A full assortment of Ship and Boat Spikes always on hand.

All orders addressed to the Agent at the Factory will receive immediate attention.

P. A. BURDEN, Agent,
Troy Iron and Nail Factory, Troy, N. Y.

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CHILLED RAILROAD WHEELS.—THE UNDERSIGNED are now prepared to manufacture their Improved Corrugated Car Wheels, or Wheels with any form of spokes or discs, by a new process which prevents all strain on the metal, such as is produced in all other chilled wheels, by the manner of casting and cooling. By this new method of manufacture, the hubs of all kinds of wheels may be made whole—that is, without dividing them into sections—thus rendering the expense of banding unnecessary; and the wheels subjected to this process will be much stronger than those of the same size and weight, when made in the ordinary way.

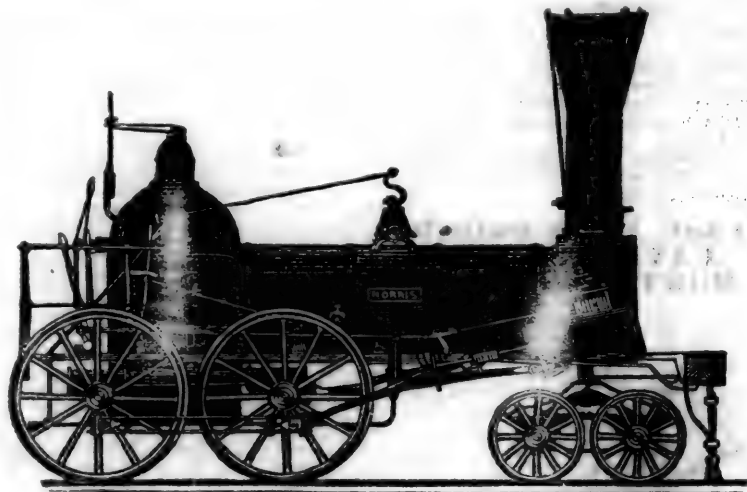
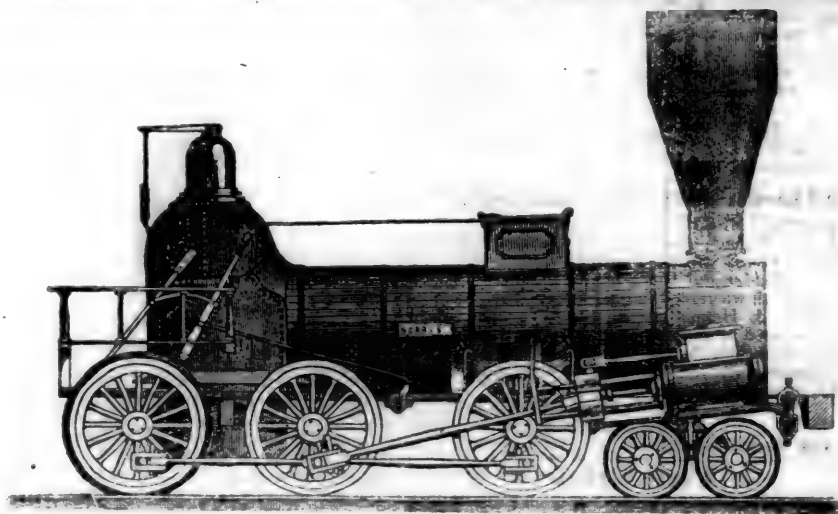
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Kensington, Philadelphia Co.,
March 12, 1848.

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For sale in lots to suit purchasers, in tight papered barrels, by

JOHN W. LAWRENCE,
142 Front-street, New York.

Orders for the above will be received and promptly attended to at this office. 32 ly.

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Four sizes being made, it will be well for those ordering to remember that the size of the shoe increases as the numbers—No. 1 being the smallest.

P. A. BURDEN, Agent,
Troy Iron and Nail Factory, Troy, N. Y.

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Railroad Car Manufactory.
RIDGWAYS & KIMBALL,

HAVE established at this central point, the manufacture of Passenger, Freight, Gravel and Hand Cars for Railroads, and assure all Western Railroad Companies that it will be their constant aim to procure the best materials and workmen, and to turn out the best kind of work at fair prices. Specimens may be seen on the Columbus and Xenia Railroad. The patronage of Railroad Companies is respectfully solicited. 1y8

To Inventors and Patentees.

OWEN G. WARREN, ARCHITECT, Has had many years' experience as Agent for obtaining Patents, both in this country and Europe, and will transact such business promptly and reasonably. Persons at a distance can have their business done by correspondence—without the necessity of visiting this city or Washington. Office No. 94 Merchants Exchange, Wall st., corner of Hanover st., up stairs. 1y3

AMERICAN RAILROAD JOURNAL.

STEAM NAVIGATION, COMMERCE, MINING, MANUFACTURES.

HENRY V. POOR, Editor.

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J. T. HODEK, *For Mining and Metallurgy.*
GEN. CHAS. T. JAMES, *For Manufactures and the
Mechanic Arts.*
M. BUTT HEWSON, C. E., *For Civil Engineering.*

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American Railroad Journal.

PUBLISHED BY J. H. SCHULTZ & Co., 136 NASSAU ST.

Saturday, March 23, 1850.

Northwestern Lead Mines.

Having been employed in the summer of 1841 in making an examination of the mineral region of Wisconsin and of part of that of Minnesota, I gathered some details, which were subsequently published in the American Journal of Science, vol. XLIII, No. 1. That paper forms the basis of the account I now propose to give of the Northwestern Lead Mines.

The region containing these mines, according to the Report of D. D. Owen, M. D., who was commissioned in the year 1839 to explore it for the U. States government, comprehends 62 townships in Wisconsin, 8 in Iowa, and 10 in Illinois, all near the Mississippi river: its extreme length from east to west being 87 miles, and width from north to south 54 miles. The townships are each six miles square.

The great belt of limestone extending over this district, which is the repository of the lead ores, is according to Prof. Hall of Albany, the continuation of the Niagara limestone of the New York system, Formation VI of the Pennsylvania and Virginia Reports. This group of strata, which in the eastern States, covers but little territory, is, in the west-

ern, the prominent rock over a very large extent of country. Here too it is found productive in the ores, which at the east are seen scattered through it in insignificant quantity. Its strata appear uniformly horizontal, until by tracing them some miles, a prevailing dip to the south is discovered. No rocks of igneous origin break through and disturb the stratification, as is seen in the lead region of Missouri; and the limestone is here of more uniform character than that of the more southern metalliferous belt, which frequently passes into a true siliceous rock.

Messrs. Owen and Locke call this metalliferous formation the "Cliff limestone," because it is often seen in the western country in abrupt cliffs along the banks of the streams; and they remark that its upper beds—those strata which occupy the surface of the country for some distance south of Galena in Illinois—are not found productive in lead ore. And they also suggest that the fissures may still occur beneath the surface in this more southern district, and sometime even this be the field of mining operations.

The lead region is a rolling hilly country; the hills sometimes covered with an open growth of oak, but as often entirely free from timber, and clothed with the tall prairie grass only. The summits are of a uniform height, and form ridges, along which one may travel miles in different directions without descending to the water courses. These commence in little swales or gullies near the top of the country, and gradually widen as they descend, till they are lost in the bottoms of the larger streams beneath. The topographical features of the country are peculiar and uniform. The bottoms have the appearance of beds of ancient currents, far greater than the present streams which flow along them. They slope gently down stream; they turn from a cliff of rock on one side into the opposite bank. These cliffs seen nowhere else, are of frequent occurrence along the boundaries of the bottoms: in all other places the rocks lie concealed beneath the deep soil. Besides these evidences of denudation, "natural mounds," as they are called, occasionally are seen standing high above the general level of the country, which are rocky, and strewn often with huge blocks fallen from their beds. Their summits formed of harder materials than the limestone of the country, as the overlying hornstone of the Blue mounds, or the siliceous limestone of the Sinsinewa mound, have resisted

the wearing action of the waters; and they now stand as monuments of the devastation produced around them. But if this be so, they are the only evidences that such forces have once been in operation; for in the western part of Wisconsin there are no primary bowlders—no loose rocks, but those which once evidently made a part of the formations on which they now repose; in the eastern part of the territory however, and in Iowa, such bowlders are not wanting. Whether this region may have been in part protected by the high lands to the north of it, and the progress of the bowlders been thus intercepted and turned aside, must be determined by more extended observations. This supposition is rendered more plausible by the unusual course of the Wisconsin river, it suddenly turning from a south to a west direction. In its valley, however, where it flows towards the west, I found no bowlders except the pebbles brought down by the river itself.

The general elevation of the country above the larger streams would not vary far, I think, from 350 feet. A large portion of the surface is open prairie, and the groves of oak and hickory are often inadequate to the wants of the people. The prairies are not like those of the lower country, extensive plains, but a succession of rolling hills spreading as far as one can see, covered with tall grass and scattering bushes. Travellers need not be confined to roads, but may ride in any direction without a path, finding everywhere good footing except in crossing the streams in the bottoms. In winter the roads are concealed beneath the snow, and people travelling in sleighs wander off and are often lost on the prairies, as in the thickest woods or at sea.

Throughout the extensive tract defined as the lead region, lead ore may be sought for with prospect of success on every township, and on almost every square mile. And fortunately it is so well watered, and the little streams fall so rapidly, that power for the smelting furnaces may almost always be obtained near the mines. The surface on the prairies and in the groves is everywhere broken by the holes sunk in "prospecting"—often dangerous pitfalls to the traveller, and a trap to the wild deer; while here and there a collection of windlasses and air-sails, and high piles of earth and rubbish mark a spot where prospecting has led to extensive mining operations.

Beneath the "Cliff limestone," is a thin stratum



A—Cliff Limestone. B—Blue Limestone. C—Sandstone.

of blue limestone, and this rests on a body of brown sandstone. As one goes from the southern line of Wisconsin to the north, this blue limestone is observed to become higher and higher in the hills, and the lead diggings to be everywhere above it. Though the sandstone rocks come out in bold cliffs on the sides of the hills, no veins of ore are ever seen in them; but in the Cliff limestone above they are found, though the rock and its fissures lie hidden under a great depth of soil.

These fissures are of every degree of width, from fifty feet down to thin cracks; all of them do not contain ore; the large chambers, when they have any mineral in them are lined on the walls with a coating of Galena seldom over a foot thick, while the interior is filled with clay. Sometimes across the crevices run horizontal layers of galena—and again it occurs in loose "chunks" in the clay of the fissures or of the soil above—and again it runs in a vertical sheet down—or still again filling narrow fissures like veins and beds in the solid rock. But galena is not the only ore these fissures contain; mixed with it in every proportion, and even sometimes getting the better of it, and shutting it out completely, occur both the carbonate and sulphuret of zinc; the one known to the miners by the name of "dry bone"—the other "black jack." From the abundance of the carbonate of zinc, and its being an ore, that, when clean, yields about 60 per cent. of the oxide, it appears probable that it will sometime become an object of importance;—now it is considered a great obstruction, and the galena, when mixed with much of the zinc ore, brings an inferior price.

The direction of the fissures downward is as variable as their size and shape. They run like cracks through a rock—sometimes vertically, sometimes inclined, and sometimes horizontally between the strata. But in all cases on reaching the sandstone they are, as far as is yet known, unproductive. They are followed when they are found to yield three inches of galena; this being the least thickness it is thought worth pursuing through rock, and it is very rare indeed that a continuous vein is found exceeding one foot in thickness. The horizontal direction of the fissures is more uniform; those producing the most ore almost universally running east and west. This is considered the direction of the main lodes of Wisconsin; others cross them running north and south, and sometimes a quartering course. In the east and west veins the ore is more frequently found in large crystals, whose surface is smooth and striae obscure; in the north and south veins it is of a closer texture and steely lustre, more readily crumbling into small particles; in this two sets of striae may be observed crossing each other at right angles; the ore from the quartering veins is distinguished by the oblique angle of the crossing of the two sets of striae. At the points of crossing of veins, a change in the

richness of the lodes usually takes place, but the change is as often for the worse as for the better. The fissures lie in ranges, which extend at right angles with their direction; in length the fissures do not appear to exceed a few hundred feet. In the neighborhood of Mineral Point, when many veins are wrought, the "diggings" are seen to extend with little irregularity in a north and south belt; the portion of this to the west produces lead ore; half a mile farther east the fissures contain copper ore, and still farther in the same direction hematite abounds in them.

The deepest shafts in this vicinity are sunk about 90 feet; and on the hills they may be worked to that depth without any trouble from the water. Begun on the highest ground, the bottom of them hardly approaches the sandstone, and into this it appears no object to continue them.

The lead ore is sought for by the miners at their own risk. Wherever they think there is a prospect of discovering a lead,* there they commence their operations; two of them joining to "prospect" or sink experimental shafts. Sometimes they spend a year in unsuccessful exploring, but with the expectation of being repaid for it all by a happy discovery. If they strike a "lead," they offer the ore to the nearest smelters at the market price; and the owner of the land then comes in for his share of one fifth, the original discoverers being entitled by the custom of the country to four fifths of all the ore they raise. Should the discovery promise to be an important one, other miners are attracted to it from the country around. They come in companies proportioned to the reputation the new diggings have acquired, and in a month's time a little village of log cabins with a population of three or four hundred people has sprung up in the midst of what was just before wild woods or an uninhabited prairie. The new comers, not having been instrumental in making the discovery, have an inferior claim to their predecessors, who are not permitted by "the rules of the miners" to monopolise more than a certain number of square rods around their successful shafts. As each one comes, he selects his own ground, and so many rods are staked out for his operations, but of the ore he raises four fifths go to the proprietors of the land, and he is allowed but one fifth. This high premium upon the discovery of new "leads" must prove very unfavorable to the thorough working of the mines and complete extraction of the ores; for miners will rather choose to go off and hunt up new veins, than continue to work one only moderately productive, of which they receive but one fifth.

Alabama.

The citizens have, by a vote of 404 to 7, voted to impose upon themselves a tax of \$300,000 for the Mobile and Ohio railroad.

* Pronounced *lead*, so called from its leading to something.

For the American Railroad Journal.

I have read with some surprise an article by Mr. Fairbairn in the February No. of the Journal of the Franklin Institute, on the smelting of magnetic iron ores. The article seems to me to show great errors in judgment, as well as in matters of fact; and is not what we should expect from one who evidently thinks himself so well informed, practically and theoretically, as to be able to communicate valuable information to his readers. I have not time now to mention all the mistakes which have met my eye. It is not true that the furnaces at Stanhope, N. J., are the only ones where magnetic iron ore has been successfully used alone for the production of good pig iron. Nor is it true that the expense of mixing hematite ores with the magnetic is "an expense most needlessly incurred"—or that the iron thus produced is inferior to that reduced wholly from the magnetic ore. The truth is, that the strength of cast iron made from hematite ore alone, is superior to that of any other as yet made in the United States; actual experiments prove it to be so. I am yet to be informed that any cast iron, Russia or Swedish, has given evidence of so good a tensile strength as some from the Franklin furnace, New Jersey, and from Dutchess county, New York, both made from pure hematite. There is one furnace in New York, where a rich magnetic ore has been used alone during the past year, and there is another not many miles from it, where the same ore has been carried and mixed with brown hematite and smelted. What was the result? The iron obtained from the mixture of the two was the best. The proportion of hematite is not usually so great as Mr. F. makes it; one box of the hematite to five, six, or even seven of the magnetic is found to answer best, or most facilitates the fusion of the heavier ore. Although the hematite has more oxygen to part with than the magnetic ore, yet if the blast be properly portioned it will assume the state of cast iron at about the same time with the iron that was previously in the state of protoxide, so that both will come down together—the globules of the reduced hematite encircling themselves with a covering of the fused earthy parts of the fluxes.

The following paragraph seems to show that the writer does not discriminate between two very different processes. As to a matter of fact, there is an iron ore harder than pig iron, or silicate of iron, which is often mixed with magnetic ores. There is evidently a great difference between *smelting* and *melting*.

"For, against the alleged impossibility of smelting a hard magnetic oxide of iron, there is the refutation in the daily practice of the iron founder, who melts the pig metal itself, and it will not be said that there is any iron ore which is harder than the pig."

"The practice of the iron founder may, therefore, point to the true modes of smelting the magnetic ores of the United States."

We do not think there is much weight to the first part of the following sentence, and the last part is obviously absurd.

"Were the cupola furnace filled with lump anthracite coal, two tons would equally be required for smelting a ton of pig iron, as a ton of iron from ores which are almost all iron, for there is frequently 90 per cent. of iron contained in the magnetic ores."

We have often heard people speak at random of iron ore that will yield 90 per cent. of iron, but we never heard any one go so far beyond all limits of reason, as to say, "there is frequently 90 per cent. of iron contained in the magnetic ores." There is a maximum limit to the content of iron in magnetic ore, and Mr. F. ought not to be ignorant of the fact. Even the pure crystallized magnetic iron ore, cannot possibly contain but 73 per cent. of metallic iron; so that any amount beyond that must be *native* iron. Will Mr. F. inform us where native iron is so frequently contained in magnetic iron ore?—Gov. Dickinson once informed the writer, that he thought he had found native iron in one single instance at his celebrated mine at Suckasunny, N. J.; but he afterwards changed his mind; and his ore, though it is uniformly as rich as any in the United States, never comes up to 70 per cent. even of *cast* iron. We doubt if it yields, on an average, over 65 per cent. It is the richest ore—oxidum ferroso ferricum of Berzelius. The magnetic iron ore of the Lehigh, so far from containing 90 per cent., does not afford but 63 per cent., even by chemical analysis which gives the whole quantity. For this fact, distinctly stated, we refer Mr. F. to Professor H. D. Rogers' 5th Annual Report on the Geological Survey of Pennsylvania. Mr. F. seems to argue that because the founder uses but a small quantity of limestone, therefore the smelter should use but a little, because there is only 10 per cent. of earthy ingredients in the ore. There is another aspect of the same strange error he has fallen into before. Nor is it true that the "quantity of earthy adulteration is less in magnetic iron ore than in any other whatever." It is no less than it is in the Oligistio magnetic ore, called specular ore, or even in the purest hematites.

The "chemistry of red short iron" will hardly be satisfied with Mr. F.'s explanation that the "metal of calcium is the cause of the property hitherto ascribed to the phosphoric substance" of Bergman. He says the "calcium may remain in the metal by the greater specific gravity which will cause its precipitation amongst the metal in the hearth." Now here is a metal only twice as heavy as water, which is supposed to combine with the iron by virtue of its specific gravity. Were it to form an alloy with the iron, of which he gives us no proof, there is no certainty it would impart to the iron the property which Bergman attributed to phosphorous. We are however by no means inclined to admit that Bergman was correct in his opinion. At his time nothing was known of the effects of aluminum and silicium as combined with the iron.

Mr. F. informs us that the transition limestone of the Schuylkill region approaches almost perfect purity, and usually contains 94 per cent. of pure lime. The usual composition of pure limestone is lime 56, and carbonic acid 44; or one atom of each. Had not Mr. F. to be charged with the errors already pointed out, we might have supposed this last one to have been made through inadvertence, accidentally confounding pure lime with its carbonate. But 94 per cent. would not be considered a pure limestone, as there would then be 6 per cent. of

impurity; so we are at a loss in what way to explain the error. Many of our limestones contain magnesia, and it is probable that such is the case with that from the Schuylkill.

Mr. F. informs us that the "British islands possess a geology not within the probabilities of any deposits of iron ore of a class superior to the hematites;" meaning that magnetic ores do not occur there. Here again he is mistaken, for they are found in several parts of Scotland, though owing to the scarcity of wood and the greater abundance of other ores, they have not attracted much attention. It is not to be supposed that the granite of the hills of Scotland is barren of the mines which are found in it everywhere else. Are we to understand that the *meteoric* iron shown to Mr. F. on the Lehigh was found there. For ought that appears to the contrary we should infer that it may be common there. The collectors of such treasures will be anxious to be further informed on this subject.

The statements made by Mr. F. in regard to the comparative values of hot and cold blast iron, we think are far from correct. We have had in our own experience sad and manifold proofs of the great inferiority of hot blast iron, whether made in anthracite or charcoal furnaces. We do not deny that in Great Britain a hot blast iron has been made with anthracite of superior strength compared with the general run of Scotch pig iron made from coke or from new bituminous coal. Mr. Alexander, in his valuable report on the manufacture of iron, p. 257, says, "when the stress is longitudinal, and the fibres pulled asunder, the ratio is unfavorable to the hot blast." Mr. F. does not admit the inferiority of hot blast iron. Our opinion of it is something like that of Mr. F.'s touching the "everlasting ton of limestone." FERRICUM.

Irving House, March 13, 1850.

H. V. Poor, Esq.

Dear Sir—During a recent hurried excursion through the northwestern portion of New Jersey, I had the curiosity to visit some of the forges and furnaces located in that region, so prolific in minerals of every sort. Among the most interesting of these iron manufactories may be named the extensive works of Oliver Ames and Sons, situated at Wanayanda in the county of Sussex, within a mile or two of the New York State line. This establishment, intended for the exclusive manufacture of pig iron, has been erected there, among the mountains, within four or five years; and though situated in the very midst of the fuel which it uses, and the ore which it converts, yet owing to the present unusual depression in the iron trade, it is obliged to stop, discharge all its hands, and wind up its business concerns. My arrival at the works was somewhat ill-timed, as it was about the period determined upon for closing its affairs, and the laborers were coming in from every direction to receive their dues. It was a deplorable sight, to see the office of the Messrs. Ames filled with their workmen, who were thus thrown out of immediate employment, and compelled to loose their time in search of something to do elsewhere. When the furnace is in full blast, the prosecution of its business requires the labor of about one hundred and fifty men, who are occupied in cutting wood, making charcoal, raising ore, and hauling iron. The services of these men have now all to be dispensed with, their houses will be left tenantless, and they with their families will find it necessary to remove to some other locality.

Do not scenes like these, which may be witnessed in all our iron-manufacturing states, present a curious commentary upon the present protective policy of the United States? Does not the document recently addressed to our Secretary of State, by Minister Bulwer, read strangely, when viewed in connection with facts like these? Can it be possible that he is serious in telling us that the iron trade of England is in a languishing condition?—Let this ingenious diplomatist take a glance at this important part of our *own* manufacturers. Let him visit the mountains of Maryland and Virginia—of Pennsylvania and New Jersey—where hundreds and thousands have been hitherto employed in the manufacture of iron, who are now comparatively idle. Let him visit the forges, where no hammers are heard—and the furnaces where no fires burn.—Is he aware, (if he is not he should be informed,) that the pig iron which in this country costs eighteen, twenty and twenty-two dollars per ton, can be produced in his own for ten, eleven or twelve dollars per ton? Can it be that he is ignorant of the fact, that laborers around the iron works of this country, who command six and seven and eight shillings per day, may readily be hired in his own country for half that sum? Is he not acquainted with the fact, that iron may be delivered (aside from the duty) into the city of New York from the majority of the furnaces in Scotland, with as little expense as from the majority of furnaces in our own country?—And lastly is he aware, that in producing pig iron, nineteen-twentieths of the whole cost is labor, and that hence the cost of the metal depends almost entirely upon the price of the labor employed in producing it? The raw material employed in making iron, namely, the trees as they stand in the forest, and the ore and coal, as it lies in the ground and embraces only about five per cent of its entire cost, the remaining ninety-five per cent being all labor and nothing but labor.—Hence the great advantage of English manufacturers over our own. Hence it is, that under the present tariff, our markets are flooded with British pig iron, which is held at so low a price as almost entirely to exclude the product of American furnaces; and yet the iron interest languishes on the other side of the water!

The mine from which the Messrs. Ames supplied their furnaces is situated at the summit of the mountain, about half a mile from the New York State line, and about six miles from Warwick in Orange county. At my request, one of the proprietors attended me to the place, where I spent a few hours examining the various shafts, veins and openings, and the engine and machinery employed in raising ore and pumping the water to the surface. The veins of this mine, of which there are a number, have a slant of about sixty-five degrees; the ore is strongly magnetic, is easily pulverised and and easily melted. The first opening was made here during the early part of the Revolutionary war, at which time the mine was worked some few years, and the ore hauled down the mountain, where it was converted into bar iron, at a forge in Orange county. Evidences of those early workings remained, long after the old forge that converted the ore into iron, had crumbled into ruins.

For many years after the war, nothing was done with the mine, and it remained in this condition until the attention of the Messrs. Ames was directed to it some five years ago. They immediately made preparations for working it, with a large force, erected suitable buildings upon the premises,

and put up a steam engine of fifteen horse power, to raise the ore. In the meantime, the furnace and other necessary erections had been built three miles farther back, where was a never failing water power, and wood in abundance.

When the mine was left on the first of March, which was a few days previous to the time of my visit, there had been eight shafts or openings made, in all of which were veins of rich ore, and large enough to be worked to advantage.

From the main opening, which was the one mostly worked during the years 1848-9, about five thousand tons of ore had been taken. When left, the miners had entered a new vein, into which they had mined sixteen feet from the foot wall, without any appearance of striking the upper or hanging wall. There are in this opening three veins of ore, the aggregate width of which, as far as can be ascertained, is something over twenty-five feet.—The principal vein has been sunk to the depth of fifty-one feet, and as it is now left, the bottom of the mine, and the hanging wall, present one unbroken surface of solid ore.

Another vein has been sunk to the depth of ninety feet, whence equally good ore was obtained, tho' it was abandoned because the other veins could be more cheaply worked.

Judging from a hasty view of the premises around this mine, and from conversing with some of the miners who had been engaged there, it would seem that few localities could be named, where the same quality of ore can be mined with less labor, and with less expense. I learned that all the work had been done for the past year by contract, and that the whole cost of raising the ore to the surface did not exceed one dollar and ten cents per ton;—this sum included wood for the engine, powder, candles and tools. Some of this ore has been used at several of the bloomery fires in the neighborhood, though most of the product of the mine for the past four years, has been sent to the furnace of Messrs. Ames. There its average yield in metal is fifty-five per cent. This proves it to be a very rich ore, though a strict chemical analysis shows a much greater per centage of iron. The iron made from this ore is looked upon as possessing superior quality for castings that require great strength. That which is melted by coal blast, has been much used for car wheels, and has a high reputation for the fine chill which it takes.

All things considered, this mine is undoubtedly one of the best within the limits of New Jersey.—It is extremely well situated for supplying the neighboring furnace at Wawayanda. Its ore is rich and works well in the furnace alone, it is easily pounded and easily melted, and the general appearance of the veins, and the working of the compass, would indicate that an inexhaustible supply yet lies below the surface.

Yours,

B. E. W.

On the Construction of Roads.

Continued from page 165.

GREATEST ALLOWABLE SLOPE.

A perfectly level road is thus seen to be a most desirable object; but as it can seldom be completely attained, we must next investigate the limits to which the slopes of a road should be reduced if possible, and determine what is the steepest allowable or maximum slope.

This depends on two different considerations, according as the slope is viewed as a descent or as an ascent, each of which it alternately becomes, according to the direction of the travel.

Viewed as a descent, it chiefly concerns the safety of rapid travelling, and applies especially to great public roads.

Viewed as an ascent, it chiefly concerns the draught of heavy loads, and relates particularly to routes for agricultural and other heavy transportation.

MAXIMUM SLOPE, CONSIDERED AS A DESCENT.

The slope should be so gentle, that when a heavy vehicle is descending, its gravity shall not overcome its friction so far as to permit it to press upon the horses. This limiting slope corresponds to the "angle of repose" of mechanical science; i. e., the angle made with the horizon by the steepest plane down which a body will not slide of its own accord, its gravity just balancing its friction, so that the least increase of slope would overpower the resistance of the friction, and make the body descend. This "angle of repose" should therefore be the limit of the slope of a road, for on such an inclination a vehicle once set in motion would descend with uniform, unaccelerated velocity. This angle varies with the smoothness and hardness of the road, and also with the degree of friction of the axles of the carriage. On the very best class of broken-stone roads, kept in good order, and with a good carriage, it is considered by Sir Henry Parnell, from his experiments, to be 1 in 35, (or 151 feet to the mile) which should therefore be the maximum slope upon the best roads.* On such a slope a coach may be driven down, with perfect safety and complete control, at the speed of twelve miles per hour.

If the inclination be steeper than this, the danger of the descent is greatly increased, and the speed must be lessened. If it be so steep that a carriage cannot be safely driven down at a greater speed than four miles per hour, on every mile of such a slope there will be a loss of ten minutes of time, equivalent to two miles upon a level. To avoid such an inclination, a road-maker would therefore be justified, by considerations of time-saving, in adopting a level route three times as long as the steep one.

When inclinations are reduced to this limit of 1 in 35, there is little loss of power, compared with a perfect level, in either direction of the travel; for increased labor of ascending is compensated in a great degree by the increased ease of descending, while on a steeper slope, this advantage is nullified by the necessity of the horses holding back the carriage to resist the excess of the force of gravity.

MAXIMUM SLOPE, CONSIDERED AS AN ASCENT.

Suppose that a road is to be carried over a hill, which rises 100 feet in a horizontal distance of 500 feet, (i. e., 1 in 5) and which cannot be avoided by any horizontal circuit within the limits of distance indicated on page 16. The question which presents itself, is how steep can the slope of a road up the side of this hill be most advantageously laid out, since, by adopting a zigzag line, the road may be made as long and therefore as gentle in the ascent as may be desired? The shortest line would run straight up the face of the hill, and this line would give the least amount of labor; but then this labor for horses would be impossible; and even if possible, the horses could not draw up the whole load which they have been drawing on the other parts of the road, nor could they descend it with safety. But, on the other hand, the road should approach this shortest line as nearly as other considerations will permit, since, if it should zigzag excessively for the purpose of lessening the steepness, it would be so long as to increase unnecessarily its cost and the time and labor of travel upon it. A medium and compromise between these two evils must be found. What shall it be?

Supposing the load of a horse on the level portions of the road to be as much as he can regularly and constantly draw, his power of drawing it up an ascent will depend upon how much extra exertion he is capable of putting forth. This is not very accurately ascertained or defined, and depends very much on the length of the ascent, but may be assumed at double his usual exertion.* Now a

* On such roads Dr. Lardner considers the angle of repose to be as small as 1 in 40; while on roads not well freed from mud and dust, the friction increases the angle to 1 in 30; and on an inferior class of roads it is 1 in 20, or even deeper.

* Gayffier, p. 9.

horse drawing a load on a level road of the best character such as has been previously considered, is obliged by the resistance of the friction to exercise against his collar a pressure of about one thirty-fifth of the load. If he can just double this exertion, he can lift one-thirty-fifth more, and the slope which would force him to lift that proportion would be (as was shown on page 16) one of 1 in 35. On this slope he would therefore be compelled to double his ordinary exertion, and on this supposition it would be the maximum slope allowable, considered at an ascent.

These two methods of determining the maximum slope (by considering it as an ascent and as a descent) are entirely independent of each other.* If they give different results, the smallest one, or the least slope obtained, must be adopted; for, if it be disadvantageous to employ a slope steeper than 1 in 35, it must *a fortiori* be still more so, to employ one steeper than 1 in 30, or 1 in 20; though even greater slopes are too often met with.

Upon most of our American roads the resistance of friction would be found to be nearer one-twentieth than one-thirty-fifth, and 1 in 20 would therefore be their maximum slope with their present condition of surface. But as it is to be hoped that in this respect they will, before long, be greatly improved, in which case they would demand more and more gentle slopes, we should anticipate this desirable consummation, by giving in advance to all new lines of road at least, if not to the faulty old ones slopes not exceeding 1 in 30, which seems to be a just medium.

The maximum established by *L'administration des Ponts et Chaussées*, the French Government board of engineers of roads and bridges, 1 in 20. This, however, was fixed, at a time when the usual surface of roads was much inferior to its present condition.

The great Holyhead road, made by Telford through the very mountainous district of North Wales, has 1 in 30 for its maximum, except in two cases, (one of 1 in 22, and a very short one of 1 in 17) and in them the surface of the road was made peculiarly smooth and hard, so that no difficulty is felt by loaded vehicles in ascending. On the old line of road, the inclinations had been sometimes as great as 1 in 6, 1 in 7, &c.

On the great Alpine road over the Simplon pass, (which rises to a height of a mile and a quarter above the level of the sea) the slopes average 1 in 23 on the Italian side, and 1 in 17 on the Swiss side, and in one case only became as steep as 1 in 13.

In the State of New York, several turnpike companies are limited by law to a maximum slope of "eighteen inches to a rod," i. e. 1 in 11. But this limit ought not to be even approached in practice.

On our "National" or "Cumberland" road the slopes in many places are much too great; and its superintendent, Cap. Wever, writes,* that "if the road had been very considerably elongated in order so effect a graduation at angles not exceeding three degrees, or 1 in 19, (and for the maximum, two degrees, or 1 in 29, would be better) the road could be travelled in as short space of time as it now is, and the power used could move double the burden it now can; thus rendering the road, for commercial purposes, doubly advantageous."

If the ascent be one of great length, it will be advantageous to make steepest the lowest portion of it, upon which the horses come with their full strength, and to make the slopes gentler towards the summit of the ascent, to correspond to the continually decreasing strength of the fatigued horses.

MINIMUM SLOPE.

A true level has been thus far considered to be a most desirable attribute, and one to be earnestly sought for, in establishing a perfect road. This

* They give identical results in this case, only because the extra exertion happened to be taken as doubled. Suppose it to be tripled. The horse can lift two-thirty-fifths more, which corresponds to a slope of 1 in 17½. Horses can indeed for a short time exercise a tension of six times the usual amount, but the above assumption of double is more dependable, though it cannot be fixed with the precision which is desirable.

* Report to United States Chief Engineer, 1838.

principle must be qualified, however, by the announcement that there is a *minimum*, or least allowable slope, which the road must not fall short of, as well as a *maximum* one, which it must not exceed. If the road were perfectly level in its longitudinal direction, its surface could not be kept free from water without giving it so great a rise in its middle as would expose vehicles to the danger of overturning. But when a road has a proper slope in the direction of its length, not only do the side-ditches readily discharge the water which falls into them, but every wheel-track that is made, becomes also a channel to carry off the water.

The *minimum* slope (flatter than which the road should not be) is assumed by an experienced English engineer to be one in eighty, or 66 feet to the mile. The *minimum* established in France by the *Corps des Ponts et Chaussées* is .008, or one in a hundred and twenty-five, or 42 feet to the mile.—An angle of one-half a degree is often named in this connection; it equals one in a hundred and fifteen. In a perfectly level country the road should be artificially formed into gentle undulations approximating to the *minimum* limit.

Finally, then, we arrive at this conclusion, that the longitudinal slopes of a road should be kept, if possible, between 1 in 30 and 1 in 125, never steeper than the former, nor nearer to a level than the latter.

TABLES OF INCLINATIONS.

There being three different methods of specifying degrees of inclination, (viz. by the angle made with the horizon, by the proportion between the ascent and the horizontal distance, and by the ascent per mile) it is frequently desirable to compare the different expressions. The following tables show the values which correspond to each other.

Angles.	Inclinations.	Feet per mile.
1°	1 in 115	46
1°	1 in 76	69
1°	1 in 57	92
1½°	1 in 38	138
2°	1 in 29	184
2½°	1 in 23	231
3°	1 in 19	277
4°	1 in 14	369
5°	1 in 11	462

Inclinations.	Angles.	Feet per mile.
1 in 10	5° 43'	528
1 in 13	4° 24'	406
1 in 15	3° 49'	352
1 in 20	2° 52'	264
1 in 25	2° 18'	211
1 in 30	1° 55'	176
1 in 35	1° 38'	151
1 in 40	1° 26'	132
1 in 45	1° 16'	117
1 in 50	1° 9'	106
1 in 100	0° 35'	53
1 in 125	0° 28'	42

To be continued.

To the Furnace-Owners throughout the Union.

New York, March 18, 1850.

GENTLEMEN:—Will you allow me, a practical man, unacquainted with the intricacies of legislation, to submit for your consideration a proposition for protecting, independently of Congressional enactments, the great interests in which you are so deeply concerned—the manufacture of American iron?

The raw material of iron is more abundant in this country than in England: it may in fact be said to be found strewn over the surface in almost every State in the Union. The smelting furnace also is on the ground; but tho' the railroad passing its door requires thousands of tons of iron, the ore is useless, the furnace is stopped, the workmen are idle! Why is this so?—Because England can undersell you in your own market.

England can undersell you in rails because labor is cheaper in that country than in this; and that a great proportion of the cost of producing this article is made up of labor. How can this disadvan-

tage be met without reducing the rate of wages?—By introducing an article absorbing the smallest possible amount of labor.

Another reason why England can undersell you, lies in the abundance of her capital. A nominal percentage on investment in plant, machinery and the like, will pay the English iron master; whereas such a profit would amount with you to positive ruin. You can however meet the difficulty by simplifying the production of rails.

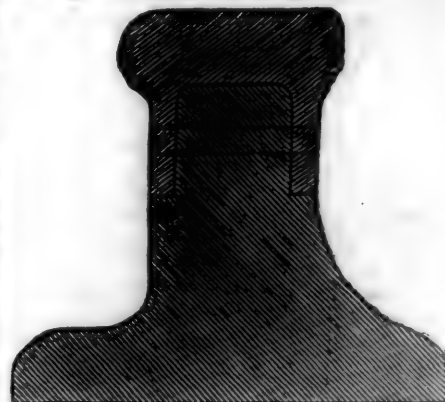
In order to meet those two causes of your exclusion from your own market, that is to say, to reduce the amount of labor and to avoid the use of expensive percentage-paying plant, I propose for your consideration the employment of pig or cast iron as a material for rails.

With you who it may be presumed are aware of the capabilities of that metal, it is unnecessary to state the facts affecting the practicability of cast rails, except in a general way. The strength of cast iron, as established by the fullest investigation, is given by Tredgold, Barlow, Hodgkinson, at about one-ninth less than that of wrought iron; whereas in the case of regular castings, the cost is one-third less, and in the case of pigs is even more than one-half less. Now in the case of a cast and a wrought rail of the same cost, this relation of strength and value produces a very decided advantage in favor of the casting: the upper and lower webs being very nearly the same in both rails, the difference of weight goes for the greater part to increase the depth; and as the strength increases in proportion to the square of the depth—a rail of three inches deep being 2½ times as strong as a similar rail two inches deep—the strength of rails increases much more rapidly than their weight. I have before me this moment a section of a 63 lb. wrought rail, and another (assuming the cost as 1 to 2) of cast metal its equivalent in cost, the cast rail being according to well established formulæ at least four times stronger than the other. Now cast iron rails have never been tried on longitudinal bearings.—Rigidity within the limits of easy travel is absolutely necessary to keep the wear and tear of a rail to the simple effects of friction; and therefore as one-fortieth of the running foot is fixed as the working elasticity of cast iron, the charge of brittleness cannot prejudice its success on continuous bearings of timber. But in point of fact, strange as it may appear to some persons, cast iron is more elastic than wrought iron, the extension at the limits of elasticity in the latter being only one-fifteen-hundred-and-twentieth, whereas it is as high as one-twelve-hundredth in cast iron. The breaking point is certainly nearer this limit in cast than in wrought iron; but this is a very questionable virtue, seeing that a strain beyond the limit of elasticity while breaking the cast rail effects that rapid destruction of the wrought rail known amongst practical men as distinct from ordinary wear by the term 'deterioration.'

In truth this accommodating character of the rolled bar is the very reason why rails give out before one-fourth of their term of service. With this brief statement of the case, why gentlemen may not your castings or even your pigs be made to supersede the use of English iron for railroad purposes? As a practical engineer of some experience in the case I assure you honestly I see no reason why.

In the American Railroad Journal for the 21st July, 1849, I brought forward a rail formed by a wrought cap and a cast seat. That proposition failed to obtain any encouragement from even you who are so deeply concerned in its success. Subsequent consideration confirming my faith in the

matter, I ventured to recommend in the Railroad Journal of the 16th ult., the adoption of a simple cast iron rail. This has attracted some little notice. Perhaps in the state of opinion amongst engineers my zeal in making this proposition has however gone too far.—Every practical engineer feels the necessity of obtaining stronger and smoother joints than those of the existing system of rails; and the necessity is still more urgent, in order to avoid shocks, in the case of cast iron. The flanges contemplated in the rail described in the Railroad Journal of the 16th ult. will most probably obviate this; yet to move more cautiously in the introduction of the cast metal, it is perhaps safer in the outset, at even a partial sacrifice of purpose, to adopt the arrangement promising the smoothest joint. The following rail is contrived with that view:



This section represents an equivalent in cost to a 56 lb. rolled rail, the cap or rail (92 lbs.) being of wrought iron, the seat or continuous chair (68 lbs.) being of cast iron (rated at one-half the cost of rolled); and breaking joint with the rail is spiked in the usual way to the timber bearings. The superior strength of such a rail as this over a rolled rail of the same cost leads me to hope that, notwithstanding the imperfections consequent on such a mode of manufacture, the pigs might be run in this section directly from the smelting furnace.

Seventy millions of dollars will hardly reach the figure that under the present state of things will have been paid away for rails during the next 14 years by the people of this country to the iron masters of England. The rail of which the cross section is shown in the wood cut will—looking forward ultimately to a simple cast iron rail—divide this sum into two items, one of 27,000,000 for rolled, and another for cast metal of 43,000,000 of dollars. Now England cannot compete with you in producing the castings—at all events an American patent right will exclude her—and therefore the above rail if found to succeed will, while bringing business to the door of every furnace in the country, give you an exclusive trade to the amount of some three millions of dollars per annum for the next 14 years. With such a fair start the iron business of the country in all its departments cannot fail to reach, in a short time, a position of defiance to all foreign competition.

Gentlemen will you on all this showing aid me actively in this matter? Having a few days ago been consulted professionally on the subject of a rail for the Evansville and Mt. Carmel railroad, Indiana, I took occasion to urge on the President of that road the importance to the country of this chair rail; and hope to learn soon that some forty or fifty yards of it will be laid down for trial on that line. The public press has entertained this question of a cast rail favorably. The President

of a road in Virginia—showing the anxiety of the railroad interest in the case—has advocated my rail in the Railroad Journal. The matter therefore stands well so far; but in one of such deep importance to you, I must look for your active co-operation. In the ordinary course of bringing forward such things, a long time must elapse before railroad men will avail themselves of the invention: your individual influence in your several districts cannot fail, by bringing the rail into trial, watching its operation and establishing its success, to urge cast iron rails into general use within 12 months. Now, therefore, that I have shown fair ground and strong reasons for an effort in favor of home-made rails, I throw on you the duty to yourselves and your country of acting in the matter either collectively or individually in such a manner as your own judgment may deem most likely to obtain success.

I have the honor to be gentlemen,

Very respectfully,

Your obedient servant.,

M. BUTT HEWSON, Civ. Eng.

P. S.—In order to record the progress that may be made in this important business, I beg leave to suggest the propriety of communicating the instances and conditions of every trial that may be obtained for it, and with a view to a surer success, request that in every case of trial I be referred to for the details of the construction to be adopted.

M. B. H.

Paris and France.

Paris is a great place and it deserves to be—for no other city of the world has so much been done to render it attractive. Other cities may vie with it in some one point, but taken altogether it stands without a rival—where else is to be found a Louvre with its splendid specimens of classic art? Where beside in Paris can the student find able lectures upon the whole range of topics in science and art, open to him as also the libraries, free of charge. Where can the votary of fashion more successfully worship his idol than in Paris; the very temple of the goddess—where will the lover of pleasure find more expedients for killing time than amid the balls, the operas, the theatres, the concerts, in short the never ceasing yet ever varying round of Parisian amusements. Where can the literary man, the philosopher, the statesman, find a more brilliant circle of congenial spirits than is usually congregated in this great metropolis.—Paris is in fact, the arms of France, open in generous welcome to all nations.

It is often said that it is not so brilliant, not so gay, as before the recent political convulsions—very like this is true—the palace of the Tuileries is surely not lighted now twice a week as it used to be. It is occupied by officers of the National Guard, not by a king.

It takes time to remove the old machinery of a government; make new and produce the proper adaptation of parts, so that it will work without friction. This is rapidly being done, let croakers say what they will, and France is destined to realize the idea which fills her imagination, and for which she has made so many sacrifices. She is destined to be a Republic. She now bears the name and has some of its essentials, but the grand achievement now in progress is for the future to consummate.

Americans should be exceedingly cautious how they accept as gospel truth, the slurs and sneers which the English journals cast upon what they in

derision call, Republican France. The United States are not so old yet, it is to be hoped, as to have forgotten, if they have forgotten, the very kind treatment they received from the same press while they were struggling in a similar career—and it may not be amiss to keep in mind that in spite of the strong interest which the English, particularly the manufacturing and commercial portions, which now bear sway in governments have to do us pretty near justice, we do not now escape gibes that are as unjust as they are ungenerous and uncalled for—witness the thrusts at Alabama, in a recent number of the London Times—Republican France is a nearer and therefore more dangerous neighbor than was Republican America, and of course comes in for an even larger share of abuse.

An American will not remain in Paris a week before he feels that his impressions of France, obtained chiefly through the English journals and the thoughtless sanction given them by our own, have done her great injustice. Every day his fears for her safety will subside, and a confidence will gradually gain possession of him, that the French people possessing as they do an unusual degree of public spirit, patriotism, good taste and mental acumen, with much less excitability than is usually attributed to them, will slowly yet surely work out their political salvation in spite of the very many obstacles they have to encounter.

President Napoleon is a man of no extraordinary ability. Both his acts and appearance indicate it. The French people awoke in the morning, and found themselves a republic with universal suffrage proclaimed, and a president to be selected by themselves. As yet hardly conscious whether the thing is a dream or a reality, and having no man in their confidence and sympathy, it is not surprising that the charm of their great name swayed them. Napoleon is by no means the man they hoped, yet he may prove not a bad president for France.—Elected by such an overwhelming majority, the nephew for a time imagines he can almost tread in the gigantic foot-steps of the uncle. This idea however, has already received many shocks, if it is not entirely dispelled from his brain.

Placed at the head of a great nation without sufficient ability to overawe faction and bear sway,—the safe and almost the only position left him is a conservative one. Instead of taking the initiative and attempting to lead off in some brilliant course of policy, with the view to carry the masses along with him, in which he would be sure to fail, he is found to pursue the *laissez faire* policy—just keeping the defensive attitude sufficiently to hold in check the various factions. This is the course the nature of the case would seem to require of him, and his acts indicate that he comprehends it. He is every day being more conservative—complaisant to the people, and generous, he seems to be withdrawing himself more and more from party, leaving to the deputies and other officers their full responsibility, and seeking to merit the appellation of a kind, rather than of a great president—such a course will disarm opposition by leaving it nothing to attack and fortify him in the sympathies of the people. This with the satiety of commotion, which the country has had for two years past, the mutual check, the Orleans, the Phillipist and the Socialist parties will have upon each other, will be very likely to keep affairs in a quiescent state till the present term of the president expires.—Time will thus be given the people to discuss new

measures; to make some progress in adapting themselves to the new order of things, when the elections again arrive they will be better enabled to exercise their judgments and instincts in the choice of men, to represent them.

The result will probably be a pretty general substitution of men of the people; men in their confidence and sympathy, for those who now hold the offices and who have been hangers on at court all their lives—men of ability but destitute of principle and of sympathy with the people. The great difficulty will be to find men among the people of sufficient ability and experience in a country where the distinction of classes has always been so marked, yet I have faith that they will be found, and that the great work of republicanism in France will go surely though slowly on.

The idea is not unfrequently thrown out as if there were truth in it, that the president intends to get himself proclaimed Emperor. If he wishes it, he cannot be so foolhardy as to think of making the attempt—he is not competent to do such a thing, and to make the trial would be his ruin.—The day appointed by the English journals for this great event was the 16th of December, when the review in honor of his election was to take place, and when the order for the review was countermanded, it was asserted the real cause for the postponement was want of time to get all things ready. The ill health of the president as assigned in the Bulletin—the president was not very ill, as he took his usual rides every day, but the order for a review was inconsiderately given in the first place, and wisely recalled. No very serious disturbance would probably have occurred, yet the assembly of such immense masses gives discontent, and better opportunity to operate, and should be avoided. This was undoubtedly the real reason for the recall of the orders for a review.

The ball given by the Prefectur of Police on the evening of the 10th, at the Hotel de Ville, was a splendid affair. More than 6,000 invitations were given, and more than 1,300 ladies, the beauty and fashion of Paris graced the occasion. Every thing passed quietly that day and has remained so since. Business is quite brisk; amusements have commenced their gay round, and Paris bids fair to be as brilliant and attractive the present winter, as in years gone by. It is announced that passports, the veriest humbug of the age, and one of the greatest annoyances to travellers will be no longer required in France. The thing has not yet gone into effect, but soon will. The government deserves no credit for doing what was its duty to have done long since, yet it is a favorable indication, and is something gained.

Railroad Law.

ALBANY CIRCUIT.—Homer Collins ag't. The Albany and Schenectady Railroad Comp'y.—As the public attention has been drawn to this cause, the following brief statement in relation to it may not be deemed inappropriate. The plaintiff, formerly a resident of this city, now resides at Bushnell's Basin, Monroe county. The action was brought to recover damages for a severe personal injury received by him on board the defendants' cars, on the 3d of November, 1848. The defendants were then in the habit of sending out two morning trains to Schenectady, the one only a few minutes in advance of the other. The plaintiff was a passenger in the forward train. About ten miles from the city that train had occasion to stop to correct some small matter that was out of repair about the engine. He selected a judicious stopping place on an ascending grade and a plane, affording an undisturbed range of vision eastward for a distance of three miles. Before the engineer got ready to

start, the hind train came up, and ran into the rear car of the forward train. The plaintiff, having seen the signal made by the conductor, with his handkerchief, to the hind train, made an attempt to escape, and had just reached the platform when the collision occurred. His head and shoulder were considerably injured, but his left foot was permanently injured, having been caught in some way between the platforms and crushed. The injury resulted in the permanent loss of the limb, and came very near being followed by the loss of life.

The plaintiff proved the injury, and the manner in which it was effected, and rested; that being regarded, unexplained, as evidence of want of proper care and caution on the part of defendants.

The defence interposed was, first, that the defendants had exercised all the care, skill and caution that the law required; and second, that the plaintiff himself was guilty of imprudence in leaving his seat and placing himself on the platform, where the injury occurred. Testimony was introduced on both branches of the defence.

The judge, in substance, charged the jury, that the defendants, although not insurers, in the manner in which common carriers are, of property, yet must be held responsible for the exercise of all that care, caution and prudence in the arrangement and conduct of business, that human sagacity, with the light of experience and knowledge, could enable them to exercise, and that the increasing demand of the public, in regard to more enlarged facilities or greater speed, could not be allowed to diminish that care, caution or prudence. That whether these were, or were not, properly exercised in this case, was a question of fact for the jury. That if the defendants were lacking in that case, caution and prudence, yet if the plaintiff, on his part, was guilty of negligent conduct, or such as was in violation of the defendants' rules, or would tend to needless exposure, he would not be entitled to recover, and that whether he had or not, was a mere question of fact for the jury.

The jury, after an absence of about an hour, brought in a verdict for \$11,000 for the plaintiff.—Joshua A. Spencer and Amos Dean for the plaintiff; B. Davis Noxon of Syracuse and Marcus T. Reynolds for the defendant.—*Albany Journal*.

Maryland.

Business of the Baltimore and Ohio Railroad.—

The following are memoranda of the business of the Baltimore and Ohio railroad for the month of February, 1850:

The revenue for the month has been as follows:

	For passengers.	For freight.
Main stem.....	\$29,090 34	\$75,630 01
Washington bch....	19,523 29	3,925 68
	\$48,613 63	\$79,555 69

Making a total of \$128,169 32. These show an increase over the corresponding month of last year of \$17,942 61 on the main stem, and \$4,164, 56 on the Washington branch, making an aggregate increase of \$22,117 17.—*Patriot*.

To Gas Light Companies and Manufacturers of Gas Fittings.

We have been written to and inquired of in reference to the most approved method of manufacturing gas; and have had various inquiries propounded as to the best place of obtaining gas fixtures and apparatus. Several parties have recently been in this city with a view to the purchase of gas fittings. As gas is now used in many of the large manufacturing establishments, and in railroad depots, we would suggest to the different manufacturers of gas apparatus the expediency of advertising in the Journal, or in such papers as will reach the parties in question. An investigation into this subject has convinced us that every village of 10,000 inhabitants in the United States, will within a few years be supplied with gas works, and probably villages of half that size will generally introduce them, from motives of economy as well as from motives of public expediency. Parties desiring information in regard to gas works,

the comparative value of the various plans for its manufacture will find the matter fully treated in the columns of this Journal. We shall be happy to make known to the various gas companies in progress and already established, the most recent improvements and inventions in this important branch of manufactures, in its application to individual and public economy.

Wisconsin.

Milwaukee, Waukesha and Mississippi Railroad.

—We have read the first annual report of this company, which is actively engaged in the construction of a railroad from Milwaukee to the Mississippi river.

The amended charter under which the company acts, was granted on the 11th day of March, 1848. The corporation was organized on the 10th of May last, the sum of \$100,000 required by the charter having been subscribed to the stock of the company. This subscription was increased at the date of the report, Dec. 31, 1848, to the sum of \$600,000. It is expected this will be increased to \$1,000,000 in April. When this amount shall be obtained it is recommended that the stock books shall be closed. With this sum expended upon a sound system of finance, it is believed that the entire road can be completed without any further contributions from the stockholders.

The grading of the first section of the road from Milwaukee to Waukesha, a distance of 20½ miles, was put under contract on the 28th of September last. The bridging and superstructure was let on the 27th of December last.

The following exhibit made upon the contract prices of work let, and estimate of iron, etc. shows the cost of this division of the work:

Grading, ballasting and bridging.....	\$44,374
20½ miles superstructure.....	27,060
Fitting and laying down track, (chairs and spikes included).....	10,250
Depots, stations, passenger and freight cars.....	38,000
Engineering, superstructure, etc.....	12,968
80 tons iron, a 50=\$4,000 per mile.....	85,000
3 first class locomotives.....	15,000
Total.....	\$232,652

or \$11,349 per mile, all expenses included.

The price to be paid for grading and bridging shows a remarkably easy route. The maximum grade going west is 25 feet to the mile, and only 6 going east. Its curves are equally favorable. On the whole section under contract there is not one deep cut nor high embankment, and not a yard of rock excavation.

The rail used is to be of the H pattern. The gauge of the road is 6 feet, the same as the New York and Erie. This section of the road is to be completed for use in the month of August next, in season to secure the transportation of the present year's crop of produce.

With the low cost of the road, and the immense amount of transportation between such important termini, Lake Michigan and Mississippi, the company anticipates a very large revenue from the work. We have no doubt but that its stock will prove good investment for capital, and sufficient to justify the taking the stock by any one who wishes to receive a good return for his money. But the great object and use of the road are the facilities it will give to business, and as a natural result to all kinds of property. The construction of this road will stimulate the growth of Milwaukee to an extraordinary degree, as it will render it one of the shipping ports of a great part of the upper Missis-

ippi valley. It cannot be pushed with too much energy and zeal for the interest of Milwaukee.—The railroad, in the west particularly, is now regarded as one of the necessities of life; and in the new States their construction is commenced as soon as the primary wants of existence are provided for. It is one of the items in the arts of life which the settler carries with him from the older States, and is destined to be the ordinary and common way for the use of the whole population of this great valley.

Lake Superior.

By the advertisement of Messrs. McKnight and others, in another part of our paper, it will be observed that the facilities of communication with the upper lakes are to be greatly increased the coming season. From our acquaintance with Mr. McKnight, and our confidence in his energy, perseverance and integrity, we are pleased to learn that he has been able to put so good a boat as the *London* on the route from Detroit to the Sault, and to make arrangements for her connecting regularly with the propellers now on the upper lake. We are gratified also to learn that a charter has been procured by Mr. McKnight for a plank road across the portage, and that this is likely to be constructed the present year. A wharf too will be prepared on the opening of navigation for the accommodation of vessels at the head of the portage, thus lessening the difficulties and delays heretofore encountered in the reshipment and discharging of cargoes. All this indicates a firm confidence in the resources of the mining region, in which we fully concur. We heartily wish all success to the enterprise of this transportation company, but hope the day is not far off when the construction of a ship canal by act of Congress, will lead to some modification of their arrangements still more conducive to the convenience of the public. We propose to try this line soon after the boats commence to run; and as our occupation will probably detain us at the mines most of the season, we shall continue the series of articles upon the Lake Superior region commenced the last summer.

Ohio—Her Wealth and Resources.

The appendix to the report of the Auditor of this State furnishes the following official information:

Acres of land.....	23,768,835
Value of lands.....	\$264,661,357
Value of towns.....	71,177,354
Value of personal property monies and credits.....	92,235,476
Total value of taxable property.....	430,639,885
State tax on property.....	1,296,547
County, school and township taxes.....	1,462,721
Road tax.....	232,152
School houses and other special taxes.....	495,436
Total taxes on grand list of 1849.....	3,631,878

Railroad Stocks held by the State.

Mad river and Lake Erie.....	\$393,050
Mansfield and Sandusky.....	23,333
Little Miami.....	121,900
Stock dividends on above.....	71,300

Total amount held by the state..... \$520,183

Canal Stocks held by the State.

Cincinnati and White Water canal.....	\$150,000
Pennsylvania and Ohio.....	420,000

Total..... \$570,000

The total amount of turnpike, railroad and canal stocks held by the State is \$3,011,858. Dividends on turnpike and canal stocks last year—\$36,049.

The total amount of capital bank stock paid in, in all the banks, is \$6,488,817, and the amount of tax paid by them to the State the past year was \$52,862 58.

AMERICAN RAILROAD JOURNAL.

Saturday, March 23, 1850.

The Pacific Railroad.

The New York Tribune, of the 15th, 16th, and 18th instant, contains elaborate editorials upon this great work. In the discussion of this subject, we have made it a point to avoid controversies with our cotemporaries, but as the Tribune is known to be the oracle of a very large class of our people, and as many of the positions taken by the editor are without the least foundation in truth, though stated in such a plausible and specious manner, as is well calculated to mislead, we shall step out of the prescribed rule, for the purpose of exposing some of its absurdities.

We agree with the Tribune, as to the necessity of this road, and the importance that the appropriate steps should be immediately taken for its commencement. It is not worth the while therefore to spend much time in discussing the moral or material results that will flow from it, or the extent of its capacity to act as an agent of commerce in the transportation of merchandize; and we only introduce some extracts from this part of the argument of the Tribune, to illustrate its knowledge of the cost of transportation by railways. In relation to this, it says:

"But the great result which must with certainty follow the completion of this road is the transfer to it and to the United States of the trade of Asia.—The commerce between Europe and the East will pass over it. That trade has ruled the world of Commerce and rules it still. England is supreme, because she has monopolized it. That monopoly makes London the capital of the commercial world. Build the railroad, and the same supremacy is infallibly transferred to the United States, and to New York. Thus we shall become the carriers of the world, and the wealth of every clime will pay its tribute to American Labor. But this is not all, if it were, we should far less earnestly invoke the advent of that day when the rails, beginning at the Atlantic and traversing a continent, shall reach the shore of the Pacific. There are other and higher advantages to be reaped from this vast enterprise than a mere increase of our transportation. A great part of the Asiatic products which will then cross our territory will be paid for in American products. The vast grain growing region of the West will then have China for a market. Our Corn, which at present on its native soil is comparatively valueless, will then cheaply feed the now starving millions of that populous empire, who will thus become the steady customers of the farmers of the Northern Mississippi Valley. Thus will despotic and pauper Asia be brought into direct and constant relations with republican America. The world will be enriched, revolutionized, transformed."

After the construction of this road then, the corn of the Mississippi Valley is to cheaply feed pauper Asia. Let us see how cheaply. The distance of the centre of Mississippi Valley from San Francisco, by the route advocated by the Tribune, cannot be less than 2,300 miles. The average cost of transporting freight on the Massachusetts road for the year 1848, was 17 mills per ton per mile. It would cost at the same rate \$39 per ton, or \$1 19 per bushel, allowing 33½ bushels with the tare to the ton, to place this corn at San Francisco, allowing this corn to be worth 32 cents, at the points of delivery on the road, we have \$1 50, as its cost at San Francisco. To transport this corn from this port and deliver it to the pauper population of Asia, must cost at least 50 cents more, making a total cost on reaching the consumer of \$2 00 per bushel! Pretty expensive food this, for paupers, who can without doubt, buy twice as much, the products of their own soil, at one half or one quar-

ter the same price. Where these paupers of Asia are to get the means to pay for this Mississippi corn, from the sale of which we are to become vastly rich, or how they shall be induced to pay twice as much to us for food as it can be obtained for from among themselves, we are not informed. In one point we fully agree with the Tribune, when the results claimed by it shall take place, the world will most certainly be transformed.

Again, the Tribune is equally happy in discussing this question of vote. Upon this question it says:

The necessity of a northern rather than a southern route is a natural one. *It grows out of the form of the earth.* Every body knows that the earth is larger round at the equator than at the poles.—Consequently the farther from equator and the nearer the poles is the line in which we go around it, the shorter the distance. From Charleston, S.C.—we take a southern city as an example—to San Francisco by a route as far north as circumstances will allow the road to be built, is 2,916 miles; while by the southern route, running through Memphis, El Paso and along the Gila, it is 3,583 miles.—Starting from New York, the advantage of the northern route becomes greater. Of course the Panama, Nicaragua and Tehuantepec routes are still longer than by the Gila, for the reason that they are further to the south.

"Here's wisdom," as Capt. Cuttle says in Dombey. "Here's an opinion as is an opinion." The earth is a sphere or nearly so. Now we had always supposed the shortest line between two points in a sphere to be a direct one. A direct line from Charleston to San Francisco passes a little south of Memphis. Consequently, the shortest line between the two must run south of this last named point. But the Tribune says no—that it is 667 miles nearer to make a circuit north of Memphis, in your way to California, than it is to take the direct route. If the principle laid down by the Tribune is correct, then the shortest possible route from Charleston to San Francisco is by way of the north pole! For here the distance round the globe is nothing at all!

Having established this great principle in mensuration, the Tribune then goes on to state the consequences that result from it as follows:

And if we take for our starting point London, the present focus of the East Indian trade, we shall find that none of these southern routes will be able to change the course of eastern commerce. The Nicaragua canal offers beyond doubt the greatest inducements to such a change for the reason that it will carry ships through from ocean to ocean without the need of shifting their cargoes. But here again the form of the earth and the currents of the regular winds decide that the Asiatic trade will not be taken through the canal. Ships will be able to sail from London to China around the Cape of Good Hope in some 20 days less on the average than it will require to make the passage by way of Nicaragua, so that, immense as will be the tonnage passing by that route, ships loaded at Canton or Calcutta will not increase it. Moreover, it is plain that if it all went that way the United States would only indirectly profit by it. Our products would not pay for the goods, nor our labor be employed in their transportation. They must pass directly across our territory and our surplus production must pay for them or we fail of the great end which is so plainly within our reach.

Assuming the distance from New York to San Francisco by any feasible railroad route at 3,500 miles, and taking the cost of transportation at 17 mills per ton per mile, it will cost \$59 50 per ton to transport merchandise from San Francisco to New York. Now if the Nicaragua canal is completed, as it is admitted by the Tribune it will be, we submit whether goods could not be transported cheaper by this route than by railroad across the

continent? Would it not be cheaper for a ship with 1000 tons freight, to take the old route by the Cape of Good Hope, or the new route by the proposed canal, than to break bulk at San Francisco, and pay \$60,000 to forward its freight to New York, and there to reship it to London? We think that there can be no question of this, and we presume that no person who understands any thing of the cost of transportation by railroad believes for an instant that the heavy freight will ever leave the ship's hold after leaving Canton or Calcutta, till it is deposited in the warehouses of New York and London. We do not believe that the rest of the world is going to make our territory the thoroughfare for the transit of their merchandise at an expense of transportation two or three times greater than its cost on the ordinary route, simply to enable us to levy tribute upon it. The Tribune may believe this, but we must beg to be excused.

We have given the arguments by which the Tribune satisfactorily to itself, has settled the question of route. It now comes to the various plans for construction. These are stated to be three, as follows:—

- I. That the general government shall build the road. This plan is advocated by Col. Benton, Lieut. Maury, Mr. Loughborough and others.
- II. That the government shall issue \$98,000,000 in stock and lend it to a company which has \$2,000,000 of its own money, to help that company build it. This is Mr. Degrand's or the Boston Plan.
- III. That Congress shall set apart a strip of wild land sixty miles in width, extending from Lake Michigan through to the Pacific, for the building of the road, and authorise Asa Whitney to construct it, and pay therefor with the proceeds derived from the sale of the land.

The first two of these plans the Tribune disapproves, and supports that of Mr. Whitney, and goes on at length to defend it from the objections made to it. From this portion of the argument we quote as follows:

Another objection is that the scheme is a great land speculation. This is a mistake. Mr. Whitney does not by it become the possessor of a single acre of land, and gains no speculating advantages. The plan is this: The land is set apart, sixty miles in width; Mr. Whitney begins the road, and as soon as 10 miles are completed the Commissioner of the Land Office sells half the land—that is, of the 10 miles he sells five; no part of it becomes Mr. Whitney's property unless he buys it like any other citizen, he having no prior right of purchase or any other superiority over others.

The exact contrary to the above is the truth.—That there may be no mistake about this matter, we quote from the bill which Mr. Whitney attempted to get through last Congress, and which embodies his whole scheme, [vide his pamphlet, p. 84, sec. 4.]

And be it further enacted, That no part of the lands embraced by the provisions of this act shall be applied under its authority, and for the objects specified in the same, except under the following terms and conditions, to wit: Said Whitney shall first survey, fix upon, and locate the route for said road to a suitable bridging place on the Mississippi, if the road commence on or near Lake Michigan, or, if commencing at the other point, to such distance as shall be necessary to secure the land for the purpose aforesaid. He shall also commence the work with machinery, preparations and arrangements for its continuance, and complete ten miles of road, according to the best plan of construction of railroads in the United States at the present day, with a single track, on a gauge or width of not less than six feet, and with an iron rail of not less than sixty-four (64) pounds to the yard, at his own expense, and to the satisfaction of the commissioner hereinafter directed to be appointed, to be charged with the interests of the United

States, who shall certify to the commissioner of the General Land Office that said road has been substantially made and constructed, and in all respects in conformity to the requirements of this act, and that said road is progressing; and thereupon said Whitney, and his assigns, shall be entitled and fully authorized to sell at public or private sale, the first five miles of the breadth of said land so set apart for the construction of said road, and one-half part of the equivalent lands selected in lieu of what may have been sold; and the Commissioner of the General Land Office shall cause patents to be issued the same as for lands sold by the government; said patents to be delivered to the said Whitney, for the purchasers under contracts by and with him; and the title shall be the same as if they had purchased directly from and paid to the government for the lands.

After this we presume that the Tribune will withdraw the following flourish about free soil:

"Opposed as we are from principle to traffic in land, and earnestly as we contend for the freedom of the public domain, we see no sufficient reason for refusing to devote this track of sixty miles wide to this use. * * The only thing in this connection that we should insist on in framing the bill which makes the grant for the road, would be a proviso that no man should become the owner of more than one lot of land of a specified size, and that no man owning any other land could become the owner of any of this. With such a proviso, there could be no danger of land speculation.

If Mr. Whitney is rich enough to build one-half of the road he may be the sole owner of a strip of land 30 miles wide from the Mississippi to the Pacific; something of an estate for a democracy we think. He builds ten miles of road, and is entitled to 150 square miles of land. He sells to A. B. to-day, and A. B. reconveys to him to-morrow. The requirements of the law are complied with, and Mr. Whitney is the owner of the whole. Great free soil movement this.

Now we think it not very difficult to show, that in Mr. Whitney's scheme is projected, and if carried into effect would prove the greatest speculation yet attempted in this country. Let us commence first with the Pacific side, and see what he could do there.

Mr. Whitney must in the outset build ten miles of road, and commence upon the next ten, as a condition precedent to the grant to him of five miles by sixty. He commences at Puget Sound and builds ten miles, and then commences the second section. The land commissioner then grants to him, or his assignee, a strip of land following the coast, sixty miles by five, which at once transfers to him the Harbor, and all the adjoining lands.—After the patents are issued, and the lands have all quietly found their way back into Mr. Whitney's hands, he gradually comes to the conclusion that it will not pay to push much further in this quarter. His expenses increase as he leaves the coast. The lands which he is entitled to take as he goes along are becoming less valuable, and if he does not stop there is danger that they will not pay for the work as he goes along, that if he proceeds further, he will have to draw upon his first five miles. He has already got whatever is of value. He has given no pledge to Congress that he will go one step further than it suits his interest to go. Why should he go on and waste what he has already made in pushing a work which may turn out to be impracticable. He very prudently knocks off work, the very moment he cannot make money by going ahead. As far as he has gone he has made an immense fortune. He has secured to himself the most valuable and magnificent harbor on the Pacific coast. He has got into his pocket the very means with which it was expected that he would continue and

build the road, and government finds too late that it has been most essentially sold.

So on the eastern side. The lands decrease in value, and the expenses of constructing the road increase just in proportion as he leaves the Mississippi. But Mr. Whitney, by his own admissions, must build 800 miles before he can avail himself of more than one half the land set apart for his road; that is, a strip of land 30 miles wide on the line of the road must build it 800 miles. Now if this belt would furnish the means for this distance, the lands for the few first hundred miles must be worth two or three times as much as the cost of the road so far. Their value diminishes, and the expense of building the road increases, just in proportion as he leaves the starting point. In the progress of the work, therefore, he will reach a point where a given section of land yields only enough to build the road running through it. If he goes beyond this point he must draw from the surplus already accumulated from the lands sold. Allowing his plan to be a feasible one, this surplus must amount to millions. How should we expect a man to act in such a case? He is under no obligations to proceed further. If he goes on he may beggar himself. If he stops he can save all he has accumulated. Is it wise to put the success of the road to such a test as this? It will be directly against Mr. Whitney's interest to go beyond a certain point. Ought we not to have some guarantees from him, that all the proceeds of the land shall be appropriated to the work? Ought not the obligation to be mutual?—In fine, in dealing with Mr. Whitney, should not government adopt the same precautions, and be governed by the same rules, that business men observe in dealing with each other? If the first ten miles gives a surplus of \$100,000, let this surplus go into the U. S. Treasury, to be drawn out for the construction of such portions of the road as may run through sections that are not worth enough to build it though them.

But, says the Tribune, suppose Mr. Whitney makes this sum and then abandons the work; government is no worse off for the transaction. It has made as much money, and got ten miles of railroad into the bargain. The proper answer to this is, that if government is actually going into the construction of railroads for the purpose of making money out of its land, let it drive the best bargain it can, and put the road out to the highest bidder, and make \$200,000 instead of half that sum. Again the Tribune says:—

It is also said that by this scheme the road will never be completed. That we suppose depends on the practical means, the capital, and the number of hands employed and the skill and energy with which they are directed. As for capital there is not likely to be any difficulty; arrangements can easily be made to obtain all that is wanted at the lowest rates; as for hands Europe has them in superabundance to furnish. Last year 230,000 emigrants entered this country by the port of New York alone; and it is not too much to say that there were 400,000 in all. The number will be larger this year. Indeed there is scarcely any limitation to the swarms that might be supplied if there were any special demand for their labor. Begin this road and there certainly will be no trouble in bringing on 100,000 every year to work on the road and then settle as farmers, gardeners and mechanics beside it. With such a force the undertaking may be finished in fifteen years from its beginning.

The Tribune's estimate then is, that it will require the labor of 100,000 men fifteen years to build the road. Now we would suppose the pay of these men would average one dollar a day, embracing in this all the expenses of the work. This would re-

quire an expenditure of \$36,500,000 annually, or a total of \$547,500,000!! This sum is only \$447,500,000 greater than Mr. Degrand's estimate, and \$487,500,000 greater than Mr. Whitney's. We do not see any difficulty in obtaining a sufficient number of laborers, but we are somewhat sceptical about obtaining this amount of money; at least until increased confidence shall be put in "railway securities."

The inventors and proprietors of the Boston Plan went into a labored calculation of the time that it would take Mr. Whitney to build his road; and the result of their investigation was, that it would take 1750 years to complete it on his plan. Many persons thought that they stated the time much too low. We were however willing to take a much shorter time. We reasoned in this manner. The lands on the line of the road are to furnish the means. Now how much will the commencement of this road increase the sale of the public lands.—We are willing to allow that it would increase the sale one-fourth. The receipts from this source is estimated by the Secretary of the Treasury for the current year at \$1,700,000. Taking this as the probable yield for some time to come (not taking into account the newly acquired territory), the receipts applicable to Mr. Whitney's road would be \$425,000, or in round numbers 400,000 annually, a much greater sum—we honestly believe than the lands set apart for this road would produce. With this sum it would take Mr. Whitney 150 years to build his road.

To show that we made a liberal estimate of receipts from land along the route of the road we give the following description of them from Mr. Whitney's pamphlet:

Of the entire route, 1,200 miles is without timber even sufficient for the construction of the road, though with an abundance of coal; a great part of the distance without stone or any material for such a work, or for the settlement of the country; and the road must be the only means of transit, as it would progress, for its own material, as well as for the material for buildings and fences, for the settlement of 1200 miles of the route.

We should like to have the Tribune inform us how rapidly the country is to settle where all the materials for building, such as wood, stone, etc., etc. are to be transported one thousand miles over a railroad, and how much such land would be worth, destitute of all the natural additions to make it valuable? And who could be induced to leave the well situated, well timbered, and equally fertile lands, of which there are an abundance in the 'States,' and place himself so far beyond the bounds of civilised life. This very statement of Mr. Whitney shows the utter absurdity of his whole plan.

Since the above was written, Congress has summarily disposed of Mr. Whitney's scheme by refusing to print the report of the Committee on Roads and Canals in its favor, by a strong vote. This is the last of it, and it will be forgotten as suddenly as it rose in favor. "It went up like a rocket and came down like a stick." It gained favor because it was specious, and it lost it because this was its only merit. We earnestly opposed it in face of the united support it received from nearly the whole press of the country, and think we may claim to have done something toward bringing the public mind to view it in a true light.

To Contractors.

THE Election of Directors of the Queenston Suspension Bridge Company having taken place, the Company are now prepared to receive Plans for the Bridge and Tenders for its erection. All communications to be directed, GILBERT McMICKEN, 1ml1* Queenston.

Great American Engineering

AND MECHANICAL WORK, just published in medium folio, 75 cts.

Part III of "Specimens of the Stone, Iron and Timber Bridges, &c. &c. of the United States Railroads." By George Dugan, Architect and Civil Engineer.

The present part contains beautifully executed plans, elevations, sections and isometrical views of the elegant timber arch 275 feet span, at Cascade Creek, Pa. on the line of the N. Y. & Erie R. R., and of a plank bridge 100 feet span across the Mahawk River near Rome, on the line of the U. and S. R. R. with the specifications, estimates, bills of timber, iron, etc.

N.B.—This work is published by subscription of the most eminent in the engineering profession of the U. States, and will be completed in 12 parts, at 75 cents each to those who remit their names and subscriptions before the 1st May next, after which the price will be raised to \$1 per part.

To those making a present remittance of \$5, and the remainder \$4, when they have been supplied with the first six parts, the work will be forwarded regularly as published. Parties remitting \$9 shall receive it monthly post-free in any part of the United States.

"It is a work that was a great desideratum, and must prove of great benefit to the engineering profession generally, and especially to the tyro in practical engineering and mechanical knowledge; in truth it strikes us, that it would require years of labor and patient toil on the part of a young engineer to prepare the drawings, and collect the information that will be embodied in this work, and can now be secured for the trifling sum of \$9"—[Scientific Amer. March 16, 1850.]

In connection with this subject (Iron Railroad Structures) we take occasion to call attention again to Mr. Dugan's valuable and expensive publication, exhibiting drawings, with full descriptions of the various stone, iron and wooden bridges, viaducts, tunnels, culverts, etc., of all the Railroads in the United States. Mr. Dugan is an accomplished Architect and Civil Engineer, who came from Ireland to it is country to exercise his profession; but finding railroad construction here, in many respects, different from that he had been accustomed to in Europe, he applied himself to the study of our system; and the fruits of his researches and investigations embodied in this work, are well calculated to meet the exigencies of engineers, and to assist draughtsmen, bridge builders, mechanics and students. The work will be supplied to subscribers only, in 12 parts, at 75 cents each.—[N. Y. Journal of Commerce, Feb. 14, 1850.]

Published by **GEORGE DUGAN,**
172 East Broadway, New York.

TO CONTRACTORS.

NOTICE is hereby given, that from 30 to 60 miles of the Orange and Alexandria Railroad will be ready for examination between 1st and 15th of April next. The road passes through a very healthy and fertile region, and embraces an amount of work every way worthy of the attention of able and experienced men.

The Company prefers to let the whole work of construction in contracts of not less than 30 miles, and for that purpose parties wishing further information are invited to call at the office in Alexandria.

The bids will be made on a basis of payments in cash to the amount of 85 per cent, and the remaining 15 per cent in the stock of the company. They must be sent to this office not later than the 16th day of April next, to be submitted to the meeting of the Board of Directors to be held on the 18th of the same. By order of the Board.

T. C. ATKINSON,
Chief Engineer.

For the information of parties at a distance, it is well to state that the Orange and Alexandria Railroad is about 90 miles long, and extends from Alexandria through Fairfax, Prince William, Fauquier, Culpeper and Orange counties to Gordonsville, a point on the completed portion of the Virginia Central Railroad, formerly called the Louisa railroad.

An inspection of the map will show that its connections promise to make it as valuable a thoroughfare as any in the Union.

Railroad Iron.

THE Undersigned, Agents for Manufacturers, are prepared to contract to deliver Rails of superior quality, and of any size or pattern, to any ports of discharge in the United States.

COLLINS, VOSE & CO.,
158 South St.

New York, November 17, 1849.

Henry J. Ibbotson,

IMPORTER of Sheffield and Birmingham Goods. Also, Agent for the Manufacture of Telegraph Wire.
218 PEARL ST., NEW YORK.

Spikes, Spikes, Spikes.

ANY person wishing a simple and effective Spike Machine, or a number of them, may be supplied by addressing
J. W. FLACK,
Troy, N. Y.
March 6, 1850.

**FWLER M. RAY'S
Patent India-rubber Railroad
CAR SPRING.**

Troy, February 27, 1850.

We have been using your India-rubber Car Springs for nearly two years—and we take pleasure in saying that in our opinion the rubber has to a certain extent already, and may eventually entirely supersede all other Springs for Railroad Car purposes. We now use it entirely for Draw Springs and Bumpers, considering it better and lighter than steel.

During our two years' experience in the use of it, we have not known any to lose their elasticity, or fail in any way; and we cheerfully recommend the rubber for railroad car springs. Very respectfully,

EATON, GILBERT & CO.

Boston, March 5, 1850.

In answer to your enquiry about India-rubber Springs, I have to say that we have used them to a considerable extent on both freight and passenger cars, and also on several of our tenders; and I am very well satisfied that they answer all the purposes for which they are intended. I believe the India-rubber will soon supersede all other springs for cars and tenders.

Yours truly, **S. M. FELTON,**
Supt. Fitchburg Railroad.

Office of the New Jersey Railroad Co.,
Jersey City, March 7, 1850.

This is to certify that we have had Mr. F. M. Ray's India-rubber Springs in constant use under our cars, and as Bumper Springs for upwards of two years, and they have in every way given perfect satisfaction.

The present form of spring we deem far superior to the form of Disk, having used both forms, although we have none of those made in Disks at present in use.

We take pleasure in recommending these springs to all railroad companies.

J. P. JACKSON, Vice Pres.
New Jersey Railroad and Trans. Co.

Roxbury, February 28, 1850.

In compliance with your request, I take great pleasure in stating the result of my experience in the use of "Ray's Patented Vulcanised India-rubber Car and Engine Springs." We have used them nearly two years, and never had one fail in any way. The cold weather does not affect them, as it has other rubber springs we have used.

With sixteen years' experience as superintendent of machinery on the Boston and Providence railroad, I take pleasure in saying that your springs are the best we ever used, or I ever saw used elsewhere. We have 20 cars rigged with them, of which I can say that the springs are as good now as when first applied. I put 24 lbs. of the rubber under the forward end of one of our heaviest engines, taking off 250 lbs. of steel springs—it has been in use 18 months, and is in as good condition now as when first put under the engine.

Very respectfully yours,
GEO. S. GRIGGS,
Supt. of Machinery, Boston and Prov. R.R.

Supt. Office N.Y. & H. R.R.,
New York, March 8, 1850.

This is to certify that we have used the Rubber Springs manufactured by Mr. F. M. Ray for the past twenty months, "both for Passenger and Freight Car Springs and Bumpers, and of different sizes," and have in every case given entire satisfaction, and I consider them the best spring now in use.

M. SLOAT, Supt.

Jersey City, March 9, 1850.

This is to certify that the present form of Mr. F. M. Ray's India-rubber Car Spring I consider far superior to the form of Disk, having used both forms. I take pleasure in recommending these springs to all railroad companies.

DAVID H. BAKER,
Foreman of Car Shop of N.J. R.R. & Trans. Co.

Harlem R.R. Depot,
New York, March 7, 1850.

This is to certify that we have used Mr. F. M. Ray's India-rubber Springs for over eighteen months, and find them to be easy and durable, and recommend them to railroad companies as being superior to anything we have tried.

J. M. SMART,
Foreman at 42d St. Depot.

February 25, 1850.

From practical observation of the use of the India-rubber Car Springs, manufactured and sold by your company, we are entirely satisfied in their application, and do not hesitate to recommend them as elastic, durable, requiring no repairs for years, and retaining their consistency during all extremes of weather. We have applied them for the past two years, and consider them superior for all railroad purposes.

Yours truly,

OSGOOD BRADLEY, Car Builder, Worcester.
J. H. WATSON, do. Springfield.
DEAN, PACKARD & MILLS, do. do.
DAVENPORT & BRIDGES, do. Cambridgeport.

Fall River, February 2, 1850.

In answer to yours of the 20th ult. I would say that this company has for some 10 or 12 months past been using "Ray's India-rubber Springs." We have applied them to both passenger and freight cars with uniform success. They have invariably preserved their elasticity and consistency through all the extremes of weather; and we are now applying them whenever the steel spring fails. I am well satisfied that they are particularly adapted for railroad purposes.

Very respectfully yours, **GEO. HAVEN,**
Supt. Fall River Railroad.

New York, March 11, 1850.

I have used the Patent India-rubber Spring purchased of Mr. Ray, upon the cars of the New York and New Haven Railroad, and have found them efficient and economical; and when applied to the axles and draw springs, believe them to be quite equal to any in use. I have found a combination of these springs with a steel spring under the transom beam a very satisfactory arrangement, and am now using this plan in all new cars.

Yours respectfully,
ROBERT SCHUYLER.

Office of the Boston and Lowell Railroad,
Boston, March 8, 1850.

EDWARD CRANE, Esq.,
Agent New England Car Co.

Dear Sir—In reply to your note, it gives me pleasure to state, that the results of using your India-rubber Springs on this road have been altogether favorable.

They retain, so far as has been observed on this road, their elasticity in any temperature; and are equally unaffected by the oil, with which they are necessarily brought into contact, and which I at first apprehended might have an injurious effect.

Though not in my opinion so easy as the "Air-spring" in its perfect state, they are much more easily kept in order, (indeed they require nothing in the way of repairs,) and they last much longer, so that I am now substituting them for "air-springs," wherever these have been used under our cars.

Respectfully yours,
WALDO HIGGINSON,
Agent Boston and Lowell Railroad.

Office New Jersey Railroad Co.,
Jersey City, March 8, 1850.

FOWLER M. RAY, Esq.,
Dear Sir: In answer to your enquiries respecting the operation of the Vulcanised Rubber Springs, purchased by our company from you some two years since, I reply that they are superior to any spring in use, (that I have either seen or heard of).

The improved form of your spring, consisting of a solid piece of vulcanised rubber with bands on the outside, is far superior to your first form, consisting of disks of rubber with metallic plates interposed.

The last named form was tried, if you recollect, at a much earlier period; and then was replaced by your last form.

I have no hesitation in saying that your springs have given entire satisfaction, and most cheerfully recommend them to railroad companies throughout the country for the following reasons:

- 1st. The cost is 30 per cent. less.
 - 2d. Saving of weight on each car of 8 wheels from 700 to 800 lbs.
 - 3d. Less care and attention is required, as they are not liable to get out of repair.
 - 4th. A great saving is secured in the wear and tear of the cars and rails from their great elasticity.
 - 5th. The freedom from noise.
 - 6th. There is greater safety in case of accident, as they cannot be broken.
 - 7th. The comfort of passengers is enhanced sufficiently to pay the expense, waiving all the other reasons that I have given.
- Should this fail to satisfy any person enquiring, you are at liberty to refer to me, No. 160 Washington St., Jersey City.

Yours respectfully,
T. L. SMITH, Supt.

Railroad Iron.

OF ANY PATTERN AND WEIGHT,
Of a Favorite Brand,
And deliverable in Bond, or Duty paid, at any Port of
the U. S., contracted for on favorable terms, by
CHARLES ILLIUS,
20 Beaver St., New York.

Pig and other Iron also contracted for. Sole Agent
for "Baxter's Machine and Burning Oil"—particu-
larly adapted for "Railroads" and other Machinery—
Preferred to Sperm by the many now using it, and 25
per cent. cheaper.

**United States Railroad Guide
and Steamboat Journal.**

CONTAINING OFFICIAL TIME ADVERTISEMENTS,
Tables of Stations, Distances, Fares, Time, etc.,
with much miscellaneous matter for the travelling pub-
lic. Price 12 cents a copy. Yearly subscription \$1.
Published at 43 Ann street, New York.

**LAKE SUPERIOR LINE.
Cleveland and Detroit,**

SAULT STE. MARIE, CARP RIVER, COPPER
HARBOR, EAGLE RIVER, ISLE ROYAL,
ONTONAGON AND LA POINT.

The Proprietors of this line having added largely to
their facilities for transportation on this route, will be
prepared to ship Goods to any part of Lake Superior
during the coming season, and contract for the deliv-
ery of Copper Ore to either Boston, New York, or
Pittsburg, being connected with the Troy and West-
ern Line, from Detroit to New York, and a Daily line
of Canal Boats

FROM CLEVELAND TO PITTSBURG.

Lakes Huron and Erie.

For this portion of the route, the Proprietors are fit-
ting up a large Boat, with a powerful low pressure
engine, and a spacious upper cabin, with state rooms,
to take the place of the Franklin, which will leave
CLEVELAND every Monday Evening at 7 o'clock,
and DETROIT every Tuesday Afternoon at 2 o'clock,
going to MACKINAW and the BRUCE MINES,
and arriving at SAULT STE. MARIE on Thursday
morning. The Franklin will leave Detroit every Fri-
day for Mackinaw and Sault Ste. Marie, via the Bruce
Mines. For the transportation of heavy masses of
Copper, a Propeller will make trips as occasion may
require.

Lake Superior.

Mr. McKnight, one of the Proprietors, is construct-
ing a Wharf to the Channel Bank, at the head of the
Portage, which will enable them to load their Propel-
lers, NAPOLEON AND INDEPENDENCE, with
but 24 hours' detention at Sault Ste. Marie. One of
the Propellers will leave every Friday, making a trip
through the Lake, touching at Carp River, Ontonagon
and Isle Royal.

The great expense incurred in building wharves to
facilitate business, it is hoped, will entitle the Propri-
etors of this Line to Patronage. Goods shipped by
either G. WILLIAMS & CO., or S. P. BRADY,
Agents, Detroit, will be receipted through to their des-
tination on Lake Superior. Letters addressed to S.
McKNIGHT, Detroit, or Sault Ste. Marie, will re-
ceive attention. Supplies will be purchased and deliv-
ered at any point on Lake Superior, on the best pos-
sible terms, and all orders filled with articles of as good
quality as the market affords.

Canada Line.

To facilitate the forwarding of Goods for the Cana-
da Companies, a connection has been made with
PARK & CO., managing owners of the Propeller
Earl Cathcart, forming a direct line from Montreal to
the Bruce Mines and Sault Ste. Marie. Goods sent
by this line, care of PARK & CO., Amherstburg, or
CHAS. HUNT, Esq., Windsor, will be immediately
forwarded, and at prices decidedly to the advantage of
parties in Toronto or other Canadian Ports.

S. McKNIGHT,
J. R. LIVINGSTON,
P. B. BARBEAU.

January, 1850.

AGENTS.

G. Williams & Co., Detroit.
S. P. Brady,
P. L. Sternberg & Co., Buffalo.
Charles Hunt, Windsor.
Park & Co., Amherstburg.
W. A. Oils & Co., Cleveland.
Crawford and Chamberlain,
Rice, Clapp & CO., New York.
W. M. Gorrie, Toronto.

**STABILITY—SECURITY—PERPETUITY.
Mutual Life Insurance Co. of
New York.**

No. 35 WALL STREET.

A MILLION OF DOLLARS

Securely invested in Bonds and Mortgages on real
estate in this city and Brooklyn, and stocks of the
State and City of New York and United States Gov-
ernment.

This fund is rapidly increasing, by a widely extend-
ed and prosperous business.

The company declared a dividend of profits of fifty-
two per cent. on all existing policies on the 31st of
January, 1848.

All the Profits are Divided Among the Insured.

The premiums are payable in Cash annually, semi-
annually, or quarterly, interest being added on the de-
ferred payments.

The cash principle adopted by this company secures
to the parties for whose benefit the insurances are ef-
fected, the whole of the advantages, without subject-
ing them to the heavy drawback of accumulated prem-
ium notes.

Persons may effect insurance on their own lives and
the lives of others.

A married woman can insure the life of her husband,
the benefits of which are secured by law for the ex-
clusive use of herself or children.

Clergymen and all others dependent upon salaries
or their daily earnings are specially invited to avail
themselves of a resource whereby their surviving fam-
ilies may be secured from the evils of penury.

Pamphlets explanatory of the principles of Mutual
Life Insurance, and illustrating its advantages, with
forms of application, may be obtained at the office of
the company, 35 Wall street, or of any of its agents.

TRUSTEES.

Jos. B. Collins,
Wm. J. Hyslop,
R. H. McCurdy,
Fred. S. Winston,
C. W. Faber,
John P. Yelverton,
Theo. Sedgwick,
Stacy B. Collins,
John H. Swift,
John Wadsworth,
S. M. Cornell,
Gouv. M. Wilkins,
John V. L. Pruyn,
Fred. Whitteley,
Charles Ely,
John C. Cruger,
Walter Joy,
Alfred Pell,

David C. Colden,
Alfred Edwards,
Wm. Betts,
Joseph Blunt,
Isaac G. Pearson,
Henry Wells,
Wm. Moore,
Zebadec Cook,
Jona. Miller,
David A. Comstock,
Robert Schuyler,
James Chambers,
Joseph Tuckerman,
Moses H. Grinnell,
Wm. J. Banker,
Eugene Durilh,
Francis S. Lathrop,
John C. Thatcher.

JOSEPH. B. COLLINS, President.
ISAAC ABBATT, Secretary. 3m9

FARMERS! ATTENTION!!**John Mayher & Co's**

NEW AGRICULTURAL WAREHOUSE
AND SEED STORE.

197 WATER STREET, NEW YORK.

Where they have for Sale, the largest and most com-
plete assortment of Farming Implements, ever offered
for sale in this city—all of which they will sell 10 per
cent. Cheaper than the same kind of Goods can be
bought at any other house in the city. Our Goods are
all Warranted to give satisfaction.

FARMERS wanting to purchase, will please call
and examine our Stock before buying elsewhere.

Among our assortment may be found the Celebrated
Highest Premium Eagle Ploughs! together with all
the most approved Ploughs now in use.

Also,—Horse Powers, Threshing Machines, Fan
Mills, Corn Shellers, Straw Cutters, Corn Mills, Seed
Sowers, Churns, Ox Yokes, Ox Saws, Hay Rakes,
Horse Rakes, Patent Chain Pump (that never freezes
nor rusts), and other Pumps; in fact we have every-
thing for Farming Purposes—together with Guano,
Bone Dust and other Fertilizers.

JOHN MAYHER & CO.,
197 Water st., N. Y.

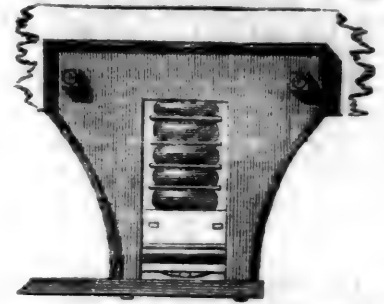
February 9, 1850.

N.B.—J. M. & Co. also continue their Old Stand,
at 195 Front street, near Fulton Market.

CAUTION.

RAILROAD COMPANIES and others are here-
by cautioned against using or vending our im-
provement for easing the lateral motion as applied on
Railroad Cars. Letters Patent having been granted
to us in 1841, any party or parties so making or using
said improvement without license from us will be pro-
ceeded against according to law.

DAVENPORT & BRIDGES.

**FULLER'S PATENT
INDIA RUBBER SPRING.**

THESE SPRINGS ARE THE CHEAPEST,
the lightest and most durable of any yet known.
They are easily applied to new or old cars, and there
is small possibility of any accident occurring to them.

Other parties through Mr. Ray set up claims to an
India Rubber Spring which, though the same in prin-
ciple, is very inferior in its working and durability.—
Actions are in progress for an Infringement on Ful-
ler's Patent against parties using that Spring.

The superiority of Fuller's Spring over that claimed
by Mr. Ray is fully established and has frequently been
testified to. The following are from gentlemen who
have had much experience with both Springs.

"It will afford me pleasure to recommend your springs
to the companies in this region, in preference to Ray's
which I am confident are inferior in mechanical ar-
rangement to yours."

JOHN M'RAE,

Engineer S. Carolina R. R., Charleston.

"I do not hesitate to allow you to say that I concur
in Mr. M' Rae's opinion that Ray's springs are infer-
ior in mechanical arrangement to Fuller's. I repeat-
edly expressed that opinion long before Mr. M' Rae
had seen your springs (as I believe) and entertain it
still."

WM. PARKER,

Gen'l Supt. of Baltimore and Ohio R. R.

Office of Sup't Norwich & Worcester R.R. Co. }
December 26, 1849. }

"I most fully concur in the opinion of Jno. McRae,
Engineer of S. Carolina Railroad, that 'Rays Springs
are inferior to Fuller's Springs,' and shall with plea-
sure recommend them to all Railroad Companies for
adoption. I have used both springs on this road and
have no hesitation in saying that I should in all cases
prefer Fuller's Spring."

SAM'L H. P. LEE, JR.,

Sup't and Engineer.

Office B. & P. R. R. Co., }

Boston, 20th December, 1849. }

"This company have cars fitted up with both Ray's
and Fuller's 'Metallic India Rubber Springs,' and I
do not hesitate to say that Fuller's arrangement is
very much superior to Ray's."

W. RAYMOND LEE, Supt.

The following result has been obtain'd by experi-
ment upon one railroad.

A set of Trucks fitted
with Steel Springs cost \$190.77 and weigh 2355 lbs.
The same with Fuller's
Springs, 131.71 " 1911 lbs.

Difference, \$59.06 " 444 lbs.

Not only is there an advantage in the cost, but ow-
ing to the great reduction in weight, the car can be
made lighter throughout, and so an enormous saving
in weight may be effected in a Train.

G. M. KNEVITT, 38 Broadway, N. Y.,

General Agent for the U. S.

The Springs can also be had of
JAMES LEE & CO., 18 India Wharf, Boston, &
JAS. THORNTON, 110 Chestnut St., Philad.
January 2, 1850.

**WHISTLER MONUMENT
Association.**

MAJOR T. S. BROWN having, in leaving this
country, resigned his office as Treasurer of this
Association, the Committee appointed for that purpose
have selected as his successor GEO. M. DEXTER,
Esq., of Boston.

Those desiring to subscribe will therefore please di-
rect their communications to Geo. M. Dexter, Civil
Engineer, etc., Boston, Mass.

A. W. CRAVEN, Secretary, etc.
New York, February 22, 1850.

To the Proprietors of Rolling Mills and Iron Works.

THE Undersigned—Proprietors of Townsend's Furnace and Machine Shop, Albany—are extensively engaged in the manufacture of Machinery and fixtures for Iron, and Copper Rolling Mills, and Iron Works. Having paid particular attention to the manufacture of *Rolls* (Rollers), both *chilled* and *dry-sand*, they feel confident that they can execute orders for such castings in a satisfactory manner. And to give assurance of this, they beg leave to refer to the following named persons, proprietors and managers of some of the most extensive rolling mills in the country, viz: Jno. F. Winslow, J. Tuckerman, H. Burden, W. Burt, J. & J. Rogers, Salsus & Co., J. B. Bailey, L. G. B. Cannon, Hawkins & Atwater, etc., etc.

F. & T. TOWNSEND.

Albany, August 18, 1849.

Arch St. Machine Shop.

BIRKENBINE, MARTIN & TROTTER,

MAKERS OF

STEAM ENGINES,

and

HYDRAULIC MACHINERY,

NO. 16 ARCH STREET,
PHILADELPHIA.

Will construct Steam Engines, Pumps, for Draining Mines and Land; supplying Water to Towns, Factories, Farms, etc;

Also, Street Stops, Fire Plugs, Water Tanks, and Hydraulic Rams, with

(BIRKENBINE'S PATENT VALVES.)

B., M. & T. contract for Warming and Ventilating Buildings by Steam or Warm Water.

THE NEWCASTLE MANUFACTURING Co. continue to furnish at the Works, situated in the town of Newcastle, Del., Locomotive and other steam engines, Jack Screws, Wrought Iron Work and Brass and Iron Castings, of all kinds connected with Steamboats, Railroads, etc.; Mill Gearing of every description; Cast Wheels (chilled) of any pattern and size, with Axles fitted, also with wrought tires, Springs, Boxes and bolts for Cars; Driving and other wheels for Locomotives.

The works being on an extensive scale, all orders will be executed with promptness and despatch. Communications addressed to Mr. William H. Dobbs, Superintendent, will meet with immediate attention.

ANDREW C. GRAY,
President of the Newcastle Manuf. Co.

Brown's Old Established SCALE WARE HOUSE,

NO. 234 WATER ST., NEW YORK.

THE Subscriber, Practical Manufacturer of Scales of every description, respectfully asks the attention of Railroad Companies to his Improved Wrought Iron Railroad Track and Depot Scales which for strength, durability, accuracy, convenience in weighing, and beauty of workmanship, are not surpassed by any others in this country.

He is aware that this is rather a bold assertion for him to make, yet he can say with confidence that they have but to be tried to give them precedence over all others.

J. L. BROWN.

Bank Scales made to order, and all Scales of his make Warranted in every particular.

References given if required.

4tf

ENGINEERS.

Banks, C. W.,

Civil Engineer, Vicksburg, Miss.

Berrien, John M.,

Michigan Central Railroad, Marshall, Mich.

Buckland, George,

Troy and Greenbush Railroad.

Clement, Wm. H.,

Little Miami Railroad, Cincinnati, Ohio.

Cozzens, W. H.,

Engineer and Surveyor, St. Louis, Mo.

Davidson, M. O.,

Eckhart Mines, Alleghany Co., Maryland.

Fisk, Charles B.,

Cumberland and Ohio Canal, Washington, D. C.

Felton, S. M.,

Fitchburg Railroad, Boston, Mass.

Floyd-Jones, Charles,

South Oyster Bay, L. I.

Gzowski, Mr.,

St. Lawrence & Atlantic Railroad, Montreal, Canada.

Gilbert, Wm. B.,

Rutland and Burlington Railroad, Rutland, Vt.

Grant, James H.,

Nashville and Chattanooga R. R., Nashville, Tenn.

Harry, P.,

Binghamton, New York.

Holcomb, F. P.,

Southwestern Railroad, Macon, Ga.

Johnson, Edwin F.,

New York and Boston Railroad, Middletown Ct.

Latrobe, B. H.,

Baltimore and Ohio Railroad, Baltimore, Md.

Miller, J. F.,

Worcester and Nashua Railroad, Worcester, Mass.

Morris, Elwood,

Schuylkill Navigation, Schuylkill Haven, Pa.

Morton, A. C.,

Atlantic and St. Lawrence Railroad, Portland, Me.

McRae, John,

South Carolina Railroad, Charleston, S. C.

Nott, Samuel,

Lawrence and Manchester Railroad, Boston,

Prichard, M. B.,

East Tennessee and Georgia R. R., Cleveland, Tenn.

Roebbling, John A.,

Trenton, N. J.

Roberts, Solomon W.,

Ohio and Pennsylvania Railroad, Pittsburgh, Pa.

Sanford, C. O.,

South Side Railroad, Virginia.

Schlatter, Charles L.,

Northern Railroad (Ogdensburg), Malone, N. Y.

Sours, Peter,

Rahway, New Jersey.

Stark, George.,

Bost., Con. and Mont. R. R., Meredith Bridge, N. H.

Steele, J. Dutton,

Pottstown, Pa.

Trimble, Isaac K.,

Philad., Wil. & Baltimore Railroad, Wilmington, Del.

Tinkham, A. W.,

United States Fort, Bucksport, Me.

Thomson, J. Edgar.,

Pennsylvania (Central) Railroad, Philadelphia.

Whipple, S.,

Civil Engineer and Bridge Builder, Utica, N. Y.

Williams, E. P.,

Auburn and Schenectady Railroad, Auburn, N. Y.

Williams, Charles H.,

Milwaukee, Wisconsin.

Wormeley, Preble,

Central Ohio Railroad, Zanesville, Ohio.

HOTELS.

JONES' HOTEL,

NO. 152 CHESTNUT STREET,
PHILADELPHIA.

BRIDGES & WEST, Proprietors.

DUNLAP'S HOTEL,

On the European Plan,
NO. 136 FULTON STREET,
Between Broadway and Nassau St.,
NEW YORK.

BUSINESS CARDS.

Nathan Caswell,

METAL BROKER, 69 WALL ST., N.Y.

For the Purchase and Sale of Railroad Iron (new and old,) Boiler Plates, Pig and Bar Iron, Lead, Tin, Copper, Spelter, etc. Refers to

Messrs. Boorman, Johnston, & Co., New York.

" Grinnell, Minturn & Co., "

" Barston, Pope & Co., "

" Earpe & Brink, Philadelphia.

" E. Pratt & Brother, Baltimore.

John Barstow, Esq., Providence.

Lewis Bullard, Esq., Boston.

February 9, 1850.

6m*

VanRensselaer Stevens,

Sup't Transportation Providence and Worcester R.R., Providence, R.I. Has had 13 years' experience in Operating Railroads. Will go South or West if applied to.

J. & Riley Carr,

Manufacturers of Cast, Shear, German and Blister

STEEL,

Of all Descriptions, Warranted Good.

BAILEY-LANE WORKS, SHEFFIELD.

R. S. DENTON, Agent,

NO. 20 CLIFF ST., NEW YORK.

STEEL AND FILES.

R. S. Denton,

20 CLIFF STREET, NEW YORK,

AGENT FOR

J. & Riley Carr's

BAILEY-LANE WORKS, SHEFFIELD,

Manufacturers of Cast, Shear, German and Blister

STEEL

Of all descriptions. Warranted Good

FILES.

*Manufacturers of Machinists' Warranted Best Cast Steel Files, expressly for working upon Iron and Steel, made very heavy for recutting.

A full Stock of Steel and Files at all times on hand. 6m4

Cumberland, (Md.,) Coals for Steaming, etc.

ORDERS RECEIVED FOR AND FILLED
by J. COWLES, 37 Wall St., N. Y.

George O. Robertson,

BROKER IN SCOTCH AND AMERICAN PIG IRON;

Bar Iron, Lead, Spelter, Tin, Copper, etc;

No. 4 Liberty Place, MAIDEN LANE,

(Near Broadway,)

NEW YORK

Manufacture of Patent Wire ROPE AND CABLES,

For Inclined Planes, Suspension Bridges, Standing Rigging, Mines, Cranes, Derrick, Tillers, &c., by
JOHN A. ROEBLING, Civil Engineer,

TRENTON, N. J.

Samuel D. Willmott,

MERCHANT, AND MANUFACTURER OF
CAST STEEL WARRANTED SAWS,

IMPORTER OF THE

GENUINE WICKESLY GRINDSTONES

NO. 8 LIBERTY STREET,

NEW YORK.

Doremus & Harris,

ANALYTICAL & CONSULTING CHEMISTS,
179 BROADWAY, NEW YORK.

SCHOOL OF CHEMISTRY.

Dudley B. Fuller & Co.,

IRON COMMISSION MERCHANTS,

No. 139 GREENWICH STREET,

NEW YORK.

Manning & Lee,

GENERAL COMMISSION MERCHANTS,

NO. 51 EXCHANGE PLACE,

BALTIMORE.

Agents for Avalon Railroad Iron and Nail Works,
Maryland Mining Company's Cumberland Coal 'CED'
—'Potomac' and other good brands of Pig Iron.

**Railroad Car Manufacturer's
Furnishing Store.**
F. S. & S. A. MARTINE,
IMPORTERS AND MANUFACTURERS OF
**RAIL ROAD CAR &
CARRIAGE LININGS,**
PLUSHES, CURTAIN MATERIALS, ETC.,
112 WILLIAM ST., NEAR JOHN.

3-4 and 6-4 Damasks, Union and Worsted; Mo-
reens, Rattinets, Cloths, Silk and Cotton Velvets,
English Bunting

S. W. Hill,
Mining Engineer and Surveyor, Eagle River,
Lake Superior.

Alfred W. Craven,
Chief Engineer Croton Aqueduct, New York.

Starks & Pruyn,
MANUFACTURERS OF ALL KINDS OF
STEAM BOILERS,
52 and 54 Liberty, corner of Pruyn street
Nathan Starks, **ALBANY** Special Partner
Wm. F. Pruyn, It. H. Pruyn.
Iron Railing, Bank and Vault Doors, Iron Shutters
Bridge and Roof Bolts, Heavy Jobbing and Forging
of all kinds.
For particulars see Adv. in another column.

To Engineers and Surveyors.
E. BROWN AND SON Mathematical inst. mak-
ers No. 27 Fulton Slip, New York, make and keep
for sale, Theodolites, Levelling inst., Levelling rods,
Surveyors Compasses, and Chains, Cases of Mathe-
matical drawing insts. various qualities, together with
a general assortment of Ivory Scales and small insts.
generally used by Engineers.

Samuel Kimber & Co.,
COMMISSION MERCHANTS
WILLOW ST. WHARVES, PHILADELPHIA.
AGENTS for the sale of Charcoal and Anthracite
Pig Iron, Hammered Railroad Car and Locomo-
tive Axles, Force Pumps of the most approved con-
struction for Railroad Water Stations and Hydraulic
Rams, etc., etc.
July, 27, 1849.

James Herron, Civil Engineer,
[OF THE UNITED STATES NAVY YARD,
PENSACOLA, FLORIDA.,
PATENTEE OF THE
HERRON RAILWAY TRACK.
Models of this Track, on the most improved plans,
may be seen at the Engineer's office of the New York
and Erie Railroad.

To Railroad Companies.
—WROUGHT IRON WHEELS—
SAFETY AND ECONOMY.
NORRIS' LOCOMOTIVE WORKS,
SCHENECTADY, NEW YORK,
Are Manufacturing Wrought Iron Driving, Truck,
Tender, and Car Wheels—made from the best Ameri-
can Iron. Address E. S. NORRIS.
May 16, 1849.

Machinery Warehouse.
S. C. HILLS, No. 43 Fulton street, New York, has
constantly for sale Steam Engines, Boilers, Lathes,
Chucks, Drills, Planers, Force and Suction Pumps;
Tonnage, Morticing and Boring Machines, Shingle
Machines, Bolt and Nut Machines, Belting, Oil, Iron
and Lead Pipe; Rubber, Percha and Leather Hose,
&c., &c.
S. C. H.'s arrangements with several machine shops
are such that he can supply, at very short notice, large
quantities of machinery.
November 23, 1849.

Cruse & Burke,
Civil Engineers, Architects and Surveyors,
Office, New York State Institution of Civil Engineers,
STATE HALL, ALBANY, N. Y.
Drawings, specifications and surveys accurately ex-
ecuted. Pupils instructed theoretically and practical-
ly at a moderate premium.
May 26, 1849.

Eaton, Gilbert & Co.,
Railroad Car, Coach and Omnibus Builders,
TROY, N. Y.

Hudson River Foundry,
THOMAS & COLLINS,
130 Quay Street, Albany.

To Railroad & Navigation Cos.
MR. M. BUTT HEWSON, *Civil Engineer*, offers his
services to Companies about to carry out the surveys
or works of a line of Navigation or Railroad. He can
give satisfactory references in New York City as to his
professional qualifications; and will therefore merely
refer here to the fact of his having been engaged for
upwards of two years conducting important Public
Works for the British Government.
Communications will find Mr. Hewson at the office
of the Railroad Journal, 54 Wall Street, New York.

Walter R. Johnson,
CIVIL AND MINING ENGINEER AND AT-
torney for Patents. Offices and Laboratory, F St.,
opposite the Patent office, Washington, D. C.

Cop Waste.
CLEAN COP WASTE, suitable for cleaning Rail-
road, Steamboat and Stationary Engines, con-
stantly on hand and for sale by
KENNEDY & GELSTON,
54 Pine St., New York.
October 27, 1849, 3m

Ranstead, Dearborn & Co.,
MANUFACTURERS OF
LOCOMOTIVE CRANKS AND CAR AXLES,
ALSO
WROUGHT IRON SHAFTING,
And All kinds of Hammered Shapes.
Forge at Commercial Point, Dorchester,
Office 25 Foster's Wharf, opposite No. 211 Broad St.
BOSTON.

IRON.
Iron.
Pig Iron, Anthracite and Charcoal; Boiler and Flue
Iron, Spring and Blistered Steel, Nail Rods, Best Re-
fined Bar Iron, Railroad Iron, Car Axles, Nails, Stove
Castings, Cast Iron Pipes of all sizes, Railway Chairs
of approved patterns for sale by
COLEMAN, KELTON & CAMPBELL,
109 N. Water St., Philadelphia.

IRONDALE PIG METAL, MANUFACTURED
and for sale by the Bloomsburg Railroad Iron Co.
DUDLEY FISHER, Treasurer.
75 N. Water St., Philadelphia.

Railroad Iron.
500 Tons, afloat, weighing 57 pounds per lineal
yard, for sale by
COLLINS, VOSE & CO.,
158 South St.
New York, November 17, 1849. 1m46

Railroad Iron.
1675 Tons, weighing about 61 lbs. per yard, 90
tons, weighing about 52 lbs. per yard, and
825 tons, weighing about 53½ lbs. per yard, of the lat-
est and most approved patterns of T rail, for sale by
BOORMAN, JOHNSTON & CO.,
119 Greenwich street.
New York, Feb. 25, 1850.

N.B.—B. J. & Co are also prepared to take con-
tracts for English rails, delivered in any of the Atlan-
tic ports of the United States.

Railroad Iron.
THE UNDERSIGNED, HAVING made arrange-
ments abroad, are prepared to contract for the deliv-
ery of Foreign rails, of approved brands upon the
most favorable terms.
They will also make contracts for American rails,
made at their Trenton works, from Andover Iron, in
whole or in part, as may be agreed upon.
They are prepared to furnish Telegraph, Spring and
Market Wire; Braziers and Wire Rods; Rivets and
Merchant Bars to order, all made exclusively from An-
dover Iron. The attention of parties who require Iron
of the very best quality for special purposes, is respect-
fully invited.
COOPER & HEWITT,
17 Burling Slip, New York.
February 15, 1850.

Glendon Refined Iron.

Round Iron, Band Iron, Hoop Iron,
Square " Flat " Scroll "

Axles, Locomotive Tyres,
Manufactured at the Glendon Mills, East Boston, for
sale by **GEORGE GARDNER & CO.,**
5 Liberty Square, Boston, Mass.
Sept. 15, 1849. 3m37

**PATENT HAMMERED RAILROAD, SHIP &
BOAT SPIKES.**—The Albany Iron Works
have always on hand, of their own manufacture, a
large assortment of Railroad, Ship and Boat Spikes
from 2 to 12 inches in length, and of any form of head.
From the excellence of the material always used in
their manufacture, and their very general use for rail-
roads and other purposes in this country, the manu-
facturers have no hesitation in warranting them fully
equal to the best spikes in market, both as to quality
and appearance. All orders addressed to the subscrib-
ers at the works will be promptly executed.

JOHN F. WINSLOW, Agent.
Albany Iron and Nail Works, Troy, N. Y.
The above Spikes may be had at factory prices, of
Erastus Corning & Co Albany; Merritt & Co., New
York; E. Pratt & Brother, Elmira, Md

**LAP—WELDED
WROUGHT IRON TUBES**
FOR
TUBULAR BOILERS,
FROM 1 1-2 TO 8 INCHES DIAMETER.
These are the ONLY Tubes of the same quality
and manufacture as those so extensively used in
England, Scotland, France and Germany, for Lo-
comotive, Marine and other Steam Engine Boilers
THOMAS PROSSER,
Patentee.
28 Platt street, New York.

Railroad Iron.
THE UNDERSIGNED ARE PREPARED TO
contract for the delivery of English Railroad Iron
of favorite brands, during the Spring. They also re-
ceive orders for the importation of Pig, Bar, Sheet, etc.
Iron.
THOMAS B. SANDS & CO.,
22 South William street,
New York.
February 3, 1849.

Iron Store.
THE Subscribers, having the selling agency of the
following named Rolling Mills, viz: Norristown,
Rough and Ready, Kensington, Triadelphia, Potts-
grove and Thorndale, can supply Railroad Companies,
Merchants and others, at the wholesale mill prices for
bars of all sizes, sheets cut to order as large as 58 in.
diameter; Railroad Iron, domestic and foreign; Loco-
motive tire welded to given size; Chairs and Spikes;
Iron for shafting, locomotive and general machinery
purposes; Cast, Shear, Blister and Spring Steel; Bol-
ter rivets; Copper; Pig iron, etc., etc.
MORRIS, JONES & CO.,
Iron Merchants,
Schuylkill 7th and Market Sts., Philadelphia.
August 16, 1849. 1y33

Railroad Iron.
THE MOUNT SAVAGE IRON WORKS, AL-
legany county, Maryland, having recently pas-
sed into the hands of new proprietors, are now prepar-
ed, with increased facilities, to execute orders for any
of the various patterns of Railroad Iron. Commu-
nications addressed to either of the subscribers will have
prompt attention. **J. F. WINSLOW, President**
Troy, N. Y.
ERASTUS CORNING, Albany
WARREN DELANO, Jr., N. Y.
JOHN M. FORBES, Boston.
ENOCH PRATT, Baltimore, Md.
November 6, 1848.

Railroad Iron.
THE SUBSCRIBERS ARE PREPARED TO
take orders for Railroad Iron to be made at their
Phoenix Iron Works, situated on the Schuylkill Riv-
er, near this city, and at their Safe Harbor Iron Works,
situated in Lancaster County, on the Susquehanna
river; which two establishments are now turning out
upwards of 1800 tons of finished rails per month.
Companies desirous of contracting will be promptly
supplied with rails of any required pattern, and of the
very best quality.
REEVES, BUCK & CO.,
45 North Water St., Philadelphia.
March 15, 1849.

Monument Foundry.

A. & W. DENMEAD & SON,
Corner of North and Monument Sts.,—Baltimore,

HAVING THEIR

IRON FOUNDRY AND MACHINE SHOP

In complete operation, are prepared to execute faithfully and promptly, orders for Locomotive or Stationary Steam Engines, Woolen, Cotton, Flour, Rice, Sugar Grist, or Saw Mills, Slide, Hand or Chuck Lathes, Machinery for cutting all kinds of Gearing, Hydraulic, Tobacco and other Presses, Car and Locomotive patent Ring Wheels, warranted, Bridge and Mill Castings of every description, Gas and Water Pipes of all sizes, warranted, Railroad Wheels with best faggotted axle, furnished and fitted up for use, complete

Being provided with Heavy Lathes for Boring and Turning Screws, Cylinders, etc., we can furnish them of any pitch, length or pattern.

Old Machinery Renewed or Repaired—and Estimates for Work in any part of the United States furnished at short notice.

June 8, 1849.

Iron Wire.

REFINED IRON WIRE OF ALL KINDS.
Card, Reed, Cotton-flyer, Annealed, Broom, Buckle, and Spring Wire. Also all kinds of Round, Flat or Oval Wire, best adapted to various machine purposes, annealed and tempered, straightened and cut any length, manufactured and sold by

ICHABOD WASHBURN.

Worcester, Mass., May 23, 1849.

American and Foreign Iron.

FOR SALE,

300 Tons A 1, Iron Dale Foundry Iron.

100 " 1, " " "

100 " 2, " " "

100 " " Forge " "

400 " Wilkesbarre " "

100 " " Roaring Run" Foundry Iron.

300 " Fort " "

50 " Catoctin " "

250 " Chikiswalungo " "

50 " "Columbia" "chilling" iron, a very superior article for car wheels.

75 " "Columbia" refined boiler blooms.

30 " 1 x 1 Slit iron.

50 " Best Penna. boiler iron.

50 " "Puddled" " "

50 " Bagnall & Sons refined bar iron.

50 " Common bar iron.

Locomotive and other boiler iron furnished to order.

GOODHUE & CO.,

New York.

64 South street

American Pig, Bloom and Boiler Iron.

HENRY THOMPSON & SON,
No 57 South Gay St., Baltimore, Md.,

Offer for sale Hot Blast Charcoal Pig Iron made at the Catoctin (Maryland), and Taylor (Virginia), Furnaces; Cold Blast Charcoal Pig Iron from the Cloverdale and Catawba, Va., Furnaces, suitable for Wheels or Machinery requiring extra strength; also Boiler and Flue Iron from the mills of Edge & Hilles in Delaware, and best quality Boiler Blooms made from Cold Blast Pig Iron at the Shandoah Works, Va. The productions of the above establishments can always be had at the lowest market price for approved paper.

American Pig Iron of other brands, and Rolled and Hammered Bar Iron furnished at lowest prices. Agents for Watson's Perth Amboy Fire Bricks, and Rich & Cos. New York Salamander Iron Chests. Baltimore, June 14, 1849. 6 mos

Wheel, Forge and Foundry Iron.

LOCUST GROVE Wheel Iron of great strength and superior chilling property. Balt. Charcoal Forge Iron, from Patuxent, Curtis Creek and Gunpowder furnaces.

Elkridge Foundry Iron, of superior strength and softness. Anthracite and Charcoal Iron from Pennsylvania and Virginia. Gas and Water Pipes, Lamp Posts from Elkridge furnace.

LEMMON & GLENN,

6m9

62 Buchanan's Wharf, Baltimore.

Iron.

THE SUBSCRIBERS having resumed the agency of the New-Jersey Iron Company, are prepared to execute orders for the different kinds and sizes of Iron usually made at the works of the company, and offer for sale on advantageous terms.—

150 tons No. 1 Boonton Foundry Pig Iron.
100 " No. 2 do. do. do.
300 " Nos. 2 & 3 Forge do. do.
100 " No. 2 Glendon do. do.
140 " Nos. 2 & 3 Lehigh Crane do do.
100 " No. 1 Pompton Charcoal do.
100 " New-Jersey Blooms
50 " New-Jersey Faggoting Iron, for shafts
Best Bars, 1/2 to 4 inch by 1/2 to 1 inch thick.
Do do Rounds and Squares, 1/2 to 3 inch.
Rounds and Squares, 3-16 to 1 inch.
Half Rounds, 1/2 to 1 in. Ovals & Half Ovals 1/2 to 1 1/2 in.
Bands, 1 1/2 to 4 inch. Hoops, 1/2 to 2 inch.
Trunk Hoops, 1/2 to 1 1/2 in. Horse Shoe & Nut Iron.
Nail Plates. Railroad Spikes.

DUDLEY B. FULLER & Co., 139 Greenwich-st. and 85 Broad-st.

WILLIAM JESSOP & SONS' CELEBRATED CAST-STEEL.

The subscribers have on hand, and are constantly receiving from their manufactory,

PARK WORKS, SHEFFIELD,

Double Refined Cast Steel—square, flat and octagon.
Best warranted Cast Steel—square, flat and octagon.
Best double and single Shear Steel—warranted.
Machinery Steel—round.

Best and 2d gy. Sheet Steel—for saws and other purposes.

German Steel—flat and square, "W. I. & S." "Eagle" and "Goat" stamps.

Genuine "Sykes," L. Blister Steel.

Best English Blister Steel, etc., etc., etc.

All of which are offered for sale on the most favorable terms by **WM. JESSOP & SONS,**

91 John street, New York.

Also by their Agents—

Curtis & Hand, 47 Commerce street, Philadelphia.

Alex'r Fullerton & Co., 119 Milk street, Boston.

Stickney & Beatty, South Charles street, Baltimore.

May 6, 1849.

Ogden & Martin's ROSENDALE CEMENT.

WE are prepared to enter into arrangements for supplying our Cement for public works or other purposes. We warrant the cement equal in every respect to any manufactured in this country. It attains a great degree of hardness, sets immediately under water, and is a superior article for masonry coming in contact with water, or requiring great strength.

For sale in tight barrels, well papered, at their office by **OGDEN & MARTIN,** 104 Wall st. ly*
February 16, 1850.

The above cement is used in most of the fortifications building by government.

JOHNSON, CAMELL & Co's Celebrated Cast Steel,

AND

ENGINEERING AND MACHINE FILES, which for quality and adaptation to mechanical uses, have been proved superior to any in the United States. Every description of square, octagon, flat and round cast steel, sheet, shovel and railway spring steel, best double and single shear steel, German steel, flat and square, goat stamps, etc. Saw and file steel, and steel to order for any purposes, manufactured at their Cyclops Steel Works Sheffield.

JOHNSON, CAMELL & CO.,
100 William St., New York.

November 23 1849.

Railroad Iron.

1,500 Tons weighing 52 lbs. per lineal yard.

500 " " 57 " " "

500 " " 56 " " "

500 " " 60 & 61 lbs. " "

Also 2 1/2 x 7 flat rails. All the above being of approved patterns. For sale by

DAVIS, BROOKS, & CO.,

69 Broad street.

N.B.—Rails imported on commission, or at a fixed price.

CUT NAILS OF BEST QUALITY, BAR IRON

(including Flat Rails) manufactured and for sale

FISHER, MORGAN & CO.,

75 N. Water St., Philadelphia.

American Cast Steel.

THE ADIRONDAC STEEL MANUFACTURING CO. is now producing, from American iron, at their works at Jersey City, N.J., Cast Steel of extraordinary quality, and is prepared to supply orders for the same at prices below that of the imported article of like quality. Consumers will find it to their interest to give this a trial. Orders for all sizes of hammered cast steel, directed as above, will meet with prompt attention.

May 28, 1849.

To Steam Engine Builders.

THE Undersigned offer for sale, at less than half its cost, the following new machinery, calculated for an engine of 62 inches cylinder and 10 feet stroke, viz.

2 Wrought Iron Cranks, 60 inches from centre to centre.

1 Do. do. Connecting Rod Strap.

2 Do. do. Crank Pins.

1 Eccentric Strap.

1 Diagonal Link with Brasses.

1 Cast Iron Lever Beam (forked).

The above machinery was made at the West Point Foundry for the U. S. Steamer Missouri, without regard to expense, is all finished complete for putting together, and has never been used. Drawings of the cranks can be seen on application to

HENRY THOMPSON & SON,

No. 57 South Gay St., Baltimore, Md.

Sept. 12, 1849.

Railroad Instruments.

THEODOLITES, TRANSIT COMPASSES, and Levels, with Fraunhoffer's Munich Glasses, Surveyor's Compasses, Chains, Drawing Instruments, Barometers, etc., all of the best quality and workmanship, for sale at unusually low prices, by

E. & G. W. BLUNT,

No. 179 Water St., cor. Burling Slip.

New York, May 19, 1849.

Ballard's Improved JACK-SCREW.

PATENTED.

THE ADVANTAGES OF THIS Screw for Stone Quarries, Railroads, Steam Boiler Builders, and for other purposes are superior to any other similar machine.

The improvement consists in being able to use either end of the screw, as occasion requires.

It is capable of raising the heaviest Locomotive with ease, being portable, strong and powerful, and not likely to get out of order.

Many Railroad Companies and Boiler Makers have them in use—by whom they are highly recommended.

JACK SCREWS, of various sizes, power and price, constantly on hand at the manufactory.

No. 7 Eldridge Street,
near Division Street.

New York, Jan. 19, 1850.

To Railroad Companies and Contractors.

FOR SALE.—Two Locomotive Engines and Tenders, at present in use on the Beaver Meadow Railroad, being too light for their coal trains, but well calculated for either gravel or light passenger trains.

They weigh, in running order, about 8 tons each—having one pair of driving wheels 4 feet diameter, 4 truck wheels 30 inches diameter, with cylinders 10 in. diameter, and 13 inches stroke of piston. Tenders on 4 wheels. Address **JAMES ROWLAND,**
Pres't. Beaver Meadow Railroad & Coal Co., Philadelphia.

or, **L. CHAMBERLAIN, Sec'y,**
at Beaver Meadow, Pa.

May 19, 1849.

SPRING STEEL FOR LOCOMOTIVES, TENDERS AND CARS.—The subscriber is engaged in manufacturing spring steel from 1 1/2 to 6 inches in width, and of any thickness required: large quantities are yearly furnished for railroad purposes, and whenever used its quality has been approved of. The establishment being large, can execute orders with great promptitude, at reasonable prices, and the quality warranted. Address **J. F. WINSLOW, Agent,**
Albany Iron and Nail Works.



To Railroad Companies.

FOR SALE—A Second-hand Locomotive Engine and Tender, of about 10 tons weight, in good order, and warranted to perform well. Any company wanting a cheap engine for a passenger or light burden train, will rarely meet with an opportunity so favorable as the present. The engine and tender are in perfect running order, and will be tested to the satisfaction of any one wishing to purchase. Price \$1,500.

Address **J. B. MOORHEAD,**
Frazer P.O., Chester county, Pa.

P.S.—The Engine can be seen by calling on H. Osmond & Co., Car-builders, Broad st., Philadelphia.
September 6, 1849.

India-rubber for Railroad Cos.

RUBBER SPRINGS—Bearing and Buffer—Fuller's Patent—Hose from 1 to 12 inches diameter. Suction Hose. Steam Packing—from 1-16 to 2 in. thick. Rubber and Gutta Percha Bands. These articles are all warranted to give satisfaction, made under Tyer & Helm's patent, issued January, 1849.—No lead used in the composition. Will stand much longer heat than that called "Goodyear's," and is in all respects better than any in use. Proprietors of railroads do not be overcharged by pretenders.

HORACE H. DAY,

Warehouse 23 Courtlandt street.

New York, May 21, 1849.

Fire Brick.

THE Subscribers have constantly on hand Rafford's Stourbridge, Oak Farms Stourbridge, Lister, Wortley, Red and White Welsh Fire Bricks, common and fancy shapes. Also,

ROOFING SLATES,

from the best Welch quarries, and of all sizes. Also,

COAL,

of all kinds—Liverpool Orrell and Cannel, Scotch, New Castle, Pictou, Sidney, Cumberland, Virginia, and all kinds of Anthracite coals. Also,

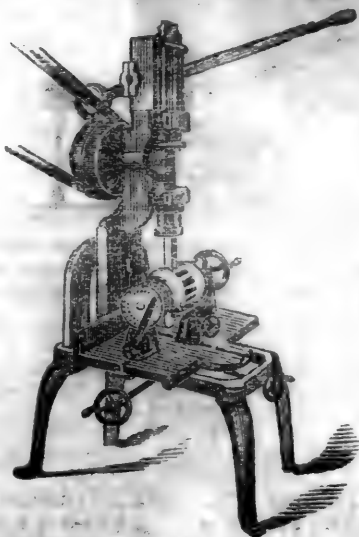
Pig Iron, Salt, etc., etc., for sale at the lowest market price. Apply to

SAMUEL THOMPSON & NEPHEW,

275 Pearl and 43 Gold Sts., New York.

November, 23, 1849.

**Capt. Alfred Swingle's
PATENT BORING
& MORTISING MACHINE.**



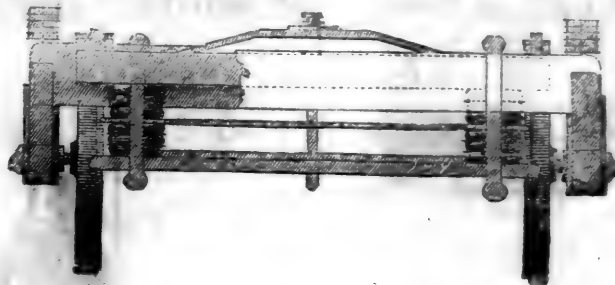
The above Machine was invented by A. SWINGLE, of Texas, in 1846, and Letters Patent were taken out in July, 1849. As a labor saving Machine it stands unrivalled even in these days of improvements. Its uses are innumerable; it may be successfully applied to Doors, Sashes, Carriages, Wheel-Hubs, and in fact to all kinds of work where the Auger and Chisel can be brought to bear.

The only limit to the speed of the working of this machine is the heating of the tools used. It will perform at least the labor of twelve men, and in vastly better manner, and can be worked equally well by steam power or by hand. It has been used and has given universal satisfaction.

For further information apply to H. B. TEBBETTS, 40 Wall St., New York, to whom all orders are to be addressed.

New York, December 15, 1849.

**FULLER'S PATENT
INDIA RUBBER CAR SPRINGS.**



RAILROAD COMPANIES are cautioned, before purchasing Springs, to examine the actual patents and judge for themselves.

Persons, under the Title of the New England Car Company, seeking fraudulently to invade Fuller's rights have put forth so many statements for the purpose of misleading the public, that an enumeration of some facts is absolutely necessary, for the purpose of putting persons interested upon their guard.

Fuller's patent is for the application of Discs of India-rubber with Metal Plates, for forming Springs for Railway Cars and Carriages—either one disc and two plates, or ten discs and plates, or any other number, are equally covered by the patent. Fuller is not bound to the use of short discs—he may use long discs and plates.

Ray's patent is simply and wholly the forming of air tight rubber cylinders, with hoops or bands round the outside, and the combination of elasticity of India rubber, with the elasticity of atmospheric air confined in the cylinder, and in no part of his patent is he authorized to use the form of spring which he is now fraudulently supplying to Railroad Companies. Such springs are direct and positive infringements of the very letter of Fuller's patent.

Fuller's patent is dated October, 1845, Ray's patent, August, 1848.

The spring patented by Ray never has been put in operation, and never can be made useful for Railroad cars.

A mere experiment, even if made, it is well known does not prove an invention; and it is ridiculous for such parties to hope to mislead the Presidents and Superintendents of Railroad companies, by claiming the invention because Ray alleges he made an experiment—which Fuller had made before him—had actually brought into working order, and obtained a patent for—and this too before Mr. Ray states he made his experiment—and that experiment not claimed to have been applied to a car or carriage.

Besides, the invention could not have been developed until India rubber, properly Vulcanised, could be made of a sufficient thickness. In the United States the art of vulcanising rubber by steam heat, (by which

means only can a body of rubber having any considerable thickness be vulcanised,) was not introduced until after the grant by the American government of the patent for springs to Fuller—whereas the process of vulcanising rubber by steam heat was invented in England about three years previously, and was used by Fuller there. This fact refutes entirely the claim of invention put forth by Mr. Ray, and proves the impossibility of his pretensions being true.

Fuller was the first and only inventor of the spring. A Mr. Dorr, whose connection with Mr. Goodyear is well known in this country, applied in England to Mr. Fuller, after he had published and patented his invention, and introduced another party for the purpose of obtaining the agency for the United States. They were furnished with a complete set of drawings and models, and with instructions to make arrangements for the supply of material of American manufacture—from that hour to the present not a single communication has been received from them. Some of these identical models have been traced into the hands of parties now seeking to invade Fuller's rights, and who have exhibited them as specimens of their own invention.

After this, the conveyance was made by Goodyear to certain parties here for the use for railroad springs of what he calls his Metallic rubber. Comment is unnecessary.

There are 5 or 6 different processes for the manufacture of vulcanised rubber, patented by as many different parties, some here, some in England, either of which would probably make good springs.

A large and powerful company has been organised under Fuller's patent, the particulars of which shall be given very shortly.

An action has been commenced against three railroad companies for infringement; and all other parties will assuredly be prosecuted if they continue further to infringe upon Fuller's patent.

W. C. FULLER,

The only persons authorised to supply the Springs are **G. M. KNEVITT**, 38 Broadway, N. York,
General Agent for the U. S.; and
JAS. LEE & Co., 18 India Wharf, Boston.
JOHN THORNLEY, Chestnut st., Philad.

**Patent India Rubber Steam
Packing.**

THIS article, made by the subscriber, who alone is authorised to make it, is warranted to stand as high a degree of heat as any that has been or can be made by any person—and is the article which has made the reputation of India Rubber Steam Packing and the demand therefor. A large assortment of all thicknesses requisite for any description of engines, steam pipes, valves, etc., constantly on hand and for sale by the manufacturer and patentee, who will give every information regarding its properties, mode of use, etc. at the warehouse.

JOHN GREACHEN, JR.,

98 Broadway, opposite Trinity Church,
New York, October, 1849.

**Ibbotson, Brothers & Co's
CELEBRATED CAST STEEL**

AND

Best Cast Steel Royal Improved Files, well known as better adapted for Engineers' and Machinists' purposes than any now in use in the United States.

Every description of Square, Octagon, Flat and Round Cast Steel, Sheet, Shovel and Railway Spring Steel, etc., and Steel to order for any purposes—manufactured at their works in Sheffield—and universally known by the old stamp "Globe."

HENRY J. IBBOTSON, Agent,

218 Pearl st., New York.

February 25, 1850.

FAIRBANKS' RAILROAD SCALES.—THE subscribers are prepared to construct at short notice, Railroad and Depot Scales, of any desired length and capacity. Their long experience as manufacturers—their improvements in the construction of the various modifications, having reference to strength, durability, retention of adjustment, accuracy of weight and dispatch in weighing—and the long and severe tests to which their scales have been subjected—combine to ensure for these scales the universal confidence of the public.

No other scales are so extensively used upon railroads, either in the United States or Great Britain; and the managers refer with confidence to the following in the United States.

Eastern Railroad.	Boston & Maine Railroad.
Providence Railroad.	Providence and Wor. Road.
Western Railroad.	Concord Railroad.
Old Colony Railroad.	Fitchburg Railroad.
Schenectady Railroad.	Syracuse and Utica Road.
Balt. and Ohio Railroad.	Baltimore and Susq. Road.
Phila. & Reading Road.	Schuylkill Valley Road.
Central (Ga.) Railroad.	Macon and Western Road.
New York and Erie Railroad.	

And other principal Railroads in the Western, Middle and Southern States.

E. & F. FAIRBANKS & CO.

St. Johnsbury, Vt.

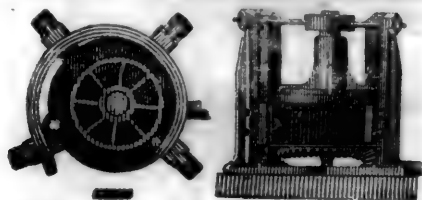
Agents, } FAIRBANKS & Co., 81 Water St., N. York.

April 22, 1849. } A. B. NORRIS, 196 Market St. Philadelphia.

1y*17

MACHINERY.

Henry Burden's Patent Revolving Shingling Machine.



THE Subscriber having recently purchased the right of this machine for the United States, now offers to make transfers of the right to run said machine, or sell to those who may be desirous to purchase the right for one or more of the States.

This machine is now in successful operation in ten or twelve iron works in and about the vicinity of Pittsburgh, also at Phoenixville and Reading, Pa., Covington Iron Works, Md., Troy Rolling Mills, and Troy Iron and Nail Factory, Troy, N. Y., where it has given universal satisfaction.

Its advantages over the ordinary Forge Hammer are numerous: considerable saving in first cost; saving in power; the entire saving of shingler's, or hammerman's wages, as no attendance whatever is necessary, it being entirely self-acting; saving in time from the quantity of work done, as one machine is capable of working the iron from sixty puddling furnaces; saving of waste, as nothing but the scoria is thrown off, and that most effectually; saving of staffs, as none are used or required. The time required to furnish a bloom being only about six seconds, the scoria has no time to set, consequently is got rid of much easier than when allowed to congeal as under the hammer. The iron being discharged from the machine so hot, rolls better and is much easier on the rollers and machinery. The bars roll sounder, and are much better finished. The subscriber feels confident that persons who will examine for themselves the machinery in operation, will find it possesses more advantages than have been enumerated. For further particulars address the subscriber at Troy, N. Y.

P. A. BURDEN.

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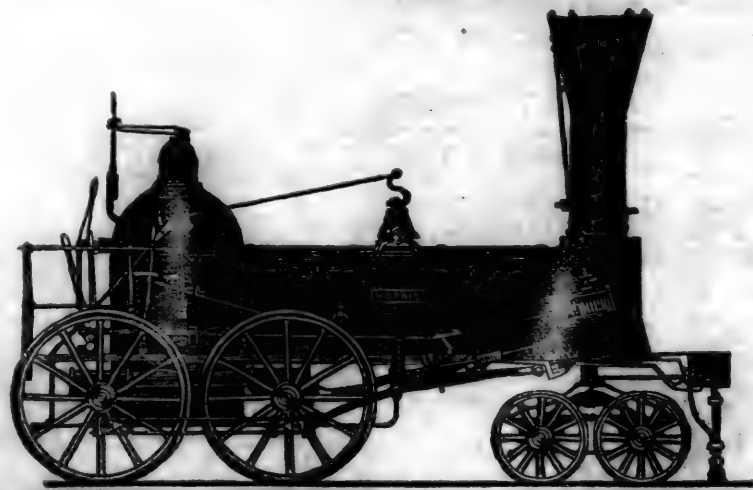
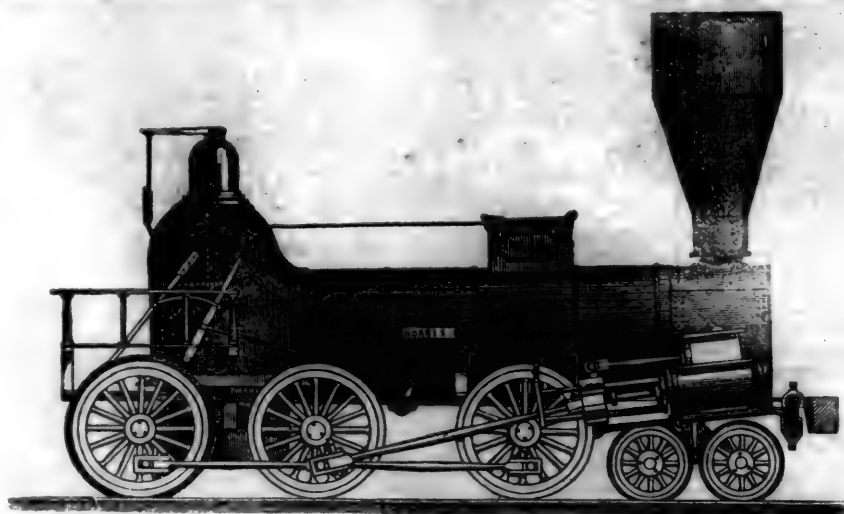
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A. T.

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March 12, 1848. }

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AMERICAN RAILROAD JOURNAL.

STEAM NAVIGATION, COMMERCE, MINING, MANUFACTURES.

HENRY V. POOR, Editor.

ESTABLISHED 1831.

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American Railroad Journal.

PUBLISHED BY J. H. SCHULTZ & CO., 136 NASSAU ST.

Saturday, March 30, 1850.

Northwestern Lead Mines.

Continued from page 173.

Sometimes the proprietor hires miners by the day, but unless he can give careful attention to them, this is considered an objectionable plan; for when the miner works on shares, it is his interest to raise as much ore as possible, but when hired by the day it is no object to him to take out any at all; and it is not by any means unusual that when employed in this way they will carefully conceal a rich lead and work in unprofitable rock, until the proprietor abandons the diggings, and years perhaps have passed, when they will come back and make a new discovery there, and work it on the large share of four-fifths. The miners sometimes sell their "prospect," when it generally comes into the possession of the proprietors, who then receive the greatest share of four-fifths, or it is bought by other miners, who are then entitled to its original privileges.

The smelters are for the most part a distinct class from the miners. They are men of little capital, who expend it in establishing one or more furnaces in what they judge a suitable locality, both for convenience of water power and proximity of mines that promise a permanent supply of ore. Their business is to visit the mines, and every day bargain for so much ore, sometimes of one set of miners, sometimes of another. The ore is weighed out by

the miners, the smelter sends his teams for it, and has it weighed again at the furnace. The price fluctuates with the price of lead, with the greater or less amount of competition either among the smelters or miners, and varies with the distance from Galena, the shipping port in Illinois. As the smelters generally have no capital to spare they must either sell their lead as they make it for what it will bring, or if they ship it themselves they are compelled to cease their operations, until they receive their returns, for in order to secure the good will of the miners they are obliged to pay for their mineral in cash, and it may be ten months before they receive the proceeds of their lead sent to the eastern market. On this account and from the unsteady character of the miners, who wander about as their fancy directs, there are few furnaces that keep in blast for a great length of time; they go for a week or a month or six months and stop as irregularly. No supply of mineral is ever bought up when it is low, though lead is often kept stacked up, waiting a higher price, and the furnaces out of blast for want of means to buy more ore.

Furnace Operations.—The furnaces are much improved within a few years past. The ore was formerly melted down on log heaps and a small portion of the metal thus extracted with a great waste of fuel. Now they are of approved forms and constructed with particular regard to the most economical method of smelting as to fuel and labor. The furnaces now employed are the *reverberatory* furnace with its modification the *cupola*, the *blast* furnace, and the *slag* furnace.

The *reverberatory* is much like the common *reverberatory* furnace for puddling iron and smelting other ores. The ore is supplied either through a hopper on the top, or through the holes in the sides, which also serve for admission to the pokers used to stir up the charge. The hearth is covered with old cinders beaten up, and it inclines back from the fire, so that the metal runs out from the end, under the chimney. In England, where these furnaces are extensively used, they are supplied with bituminous coal for fuel, but here they must make use of wood, and from the great consumption of it, this class of furnaces is only resorted to where wood is of little value, and water power is obtained. Another objection to them, besides the consumption of fuel, is that they do not smelt the ore clean, the

slag being nearly as rich as the ore originally was; and it is therefore necessary to have a slag furnace connected with them. It is supposed from rude calculations, that an ore containing about 80 per cent. of metal will yield in a reverberatory about 65, and that the slag produced will contain from 30 to 40 per cent.

The following is an estimate of the working and produce of O'Neill's furnace about two miles south of Mineral Point. It is worked 18 hours out of the 24 by two shifts; each shift two hands. The ore used varies from 9,000 to 12,000 lbs., it requiring three, sometimes four charges of 3,000 lbs. each, according to the poorer or better quality of the ore. The consumption of fuel is about two cords a day, and the produce is from 75 to 83 pigs a day of 70 lbs. average weight. The two head smelters' wages \$50 per month each; two back hands \$25, and the board of them all beside. The average price of ore in 1841 was \$15 per 1000 lbs.; lead was then worth at Galena three cents per pound.

Estimate of Expenses of Reverberatory Furnace.

Wages per month as above, \$150. Board	
four hands four weeks, \$48.....	\$198 00
Ore 10,500 lbs. daily for 26 days at \$15 per	
thousand.....	4,095 00
Wood, 52 cords, at say \$2.....	104 00
Hauling ore to furnace 273,000 lbs., at say	
75 cents per thousand.....	204 75
Hauling lead to Galena 79 pigs daily at	
20 cents per hundred.....	287 56
	\$4,889 31
Worth of 2,054 pigs of lead at Galena....	4,313 40

But besides this produce is the value of the slag made, of the value of which it is impossible to make a correct estimate. The only way perhaps by which we may approximate it is as follows:—Supposing the ore to be originally worth 75 per ct. of lead, the 273,000 lbs. then contain 204,750 lbs. of metal, of which only 143,780 lbs. have been obtained in the 2,054 pigs; 60,970 lbs. are consequently missing—allow ten per cent. for loss in the furnace, (escaping in fumes of the oxide and sulphate of lead), and there remain 54,873 lbs. of lead, which must be in the slag. Taking average pieces of this slag, which consists of a mixture of pure lead, unaltered galena, sulphate of lead and earthy matters, grinding them thoroughly and submitting portions of the powder to analysis—fusing one portion with carbonate of soda and digesting another many days in dilute nitric acid, and then fusing the insoluble

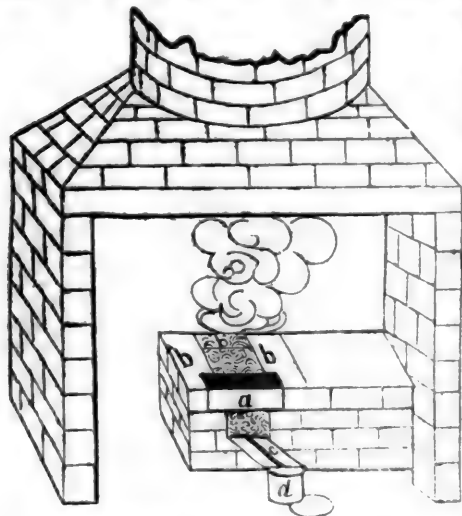
remainder with dry carbonate of soda, I obtained the following result, neglecting the sulphur and sulphuric acid:

Silica.....	15 per cent.
Sulphate of lead obtained by the action of fuming nitric acid or the sulphuret, precipitated by hydro sulphuric acid, gave lead.....	34.30 "
Per oxide of iron.....	24.53 "

The 54,873 lbs. of lead require therefore 160,000 lbs. of slag, when this contains 34.30 per cent. of lead. It seems a fair allowance that this should be worth one-third as much as the original ore, or \$5 per 1000 lbs. = \$820. Adding this sum to the value of the lead made, we have \$4,313.40 + \$820 = \$5,133.40; from which, deducting the expenses, \$4,889.31, the monthly profit is left of \$244.09.

This estimate gives a small return for the amt of capital employed; but it must be observed, that it is made out under the most unfavorable circumstances in which a smelter can be placed; for without considering the highest wages that are paid, high board, and the heavy item of hauling ore, which may be much diminished with the distance, suppose ore to be raised on land owned by the smelter, discovered by others—he saves at once \$829, and his monthly profits increase to \$1,063. Suppose him to have made the discoveries with his own hired miners on his own land, and he then saves \$3,276, making his profits for the month \$3,520. But this calculation is made rather to show what *might* happen, than what has, or is likely to. It is one of the chances of the business, in which to some extent several smelters have been fortunate; but for the most part they would be glad now to obtain half the ore they require off their own lands, as the result of the discoveries of others.

The blast furnace is like those of the same name, in general use in England; though coke is the only fuel there supposed to be suitable for it, charcoal has here been found equally good and is in general use. The following sketch will give a general



a—Cast iron plate in front of the fire.
b—Cast iron blocks forming the sides and back of the fire place.
c—Sloping hearth down which the lead runs into the pot, d.
d—Pot to catch the metal.

Across the whole front.....	11 feet 6 inches.
Depth.....	8 " 9 "
Height of furnace.....	2 " 8 "
Width of fire-place.....	1 " 7 "
Depth.....	1 " 9 "
Height above floor.....	1 " 4 "

idea of this furnace, and a minute description of its parts with working sections may be seen in Elie de Beaumont's "Voyage Metallurgique, etc."—The blast is raised by the simplest machinery—a crank on the end of the axle of the water wheel working either the common double bellows or a blowing cylinder; while another pair is often connected with the same wheel to blow a slag furnace or a copper furnace. Three hands are required to work this furnace; the head smelter, whose duties are not quite so arduous as those of the head smelter of a reverberatory, and whose pay is not so high; a "back hand," who assists the smelter by throwing in charcoal, wood and ore after he stirs the fire; and an assistant who prepares the materials. They work one shift, which ends when thirty pigs are made, and this requires from eight to ten hours. Then another set of hands come on and work another shift. Some smelters, however, employ but one set, still their day's work is over when the 30 pigs are run.

The process is this—a fire is made in the morning of billets of wood carefully arranged in the fire place, the blast is put on and charcoal added as the wood burns away; ore is then thrown on in small quantity together with a little lime. The ore has first been prepared by breaking it up either with a hammer or between a pair of cast iron rollers into pieces about the size of pigeons' eggs, and if mixed with much clay it must also have been washed in a stream of water. It is allowed to remain a few moments on the surface of the fire, while a part of the sulphur is burnt out and carried off in part combined with the oxygen of the blast which comes in from behind through the fire. When the mass begins to smelt and becomes consolidated, the head smelter with a long iron bar pries up the whole body, working under the iron plate in front of the fire; he then finishes the operation by similar stirring above, and as he opens the mass the back hand throws some billets of wood under the whole against the back wall and the twer, and immediately adds more charcoal and more ore. This remains on the surface a few moments, and then the same operation is repeated, and so on. When the material clogs up and form lumps, they are beaten and broken with the shovel or pokers. The little slag, which is produced, is thrown up in the corner of the furnace, to be broken up and mixed with the ore, or reserved for the slag furnace. It is important neither for its quantity nor its richness, this method of smelting being found very effectual in reducing the ore. The metal soon fills the basin at the bottom of the fire place, and then runs out down the groove in the sloping hearth in front into a pot, when it is kept in a melted state by a fire of chips under the pot, and is ladled out into moulds whenever convenient. The whole inside of the fire place is lined with heavy blocks of cast iron made for the purpose, and generally brought from the furnaces up the Ohio river. Considerable skill is required to manage the fire, and it is only by long practice that one learns the true method of stirring up the charge, so that the metal shall run freely and steadily. The lime is supposed to act as a flux, but very little however is used, a handful or so being thrown on at each stirring. H.

The Albany Atlas states that Allen Campbell, Esq., for many years Chief Engineer of the Harlem railroad, has been invited to undertake the construction of a railroad to Chili. He will start early in April, by the Isthmus route.

On the Construction of Roads.

Continued from page 180.

WHAT ROADS OUGHT TO BE AS TO THEIR

CROSS-SECTION.

The cross-section of a road is the view which it would present if cut through at right angles to its length, one of the portions being removed. It comprises the following subjects of investigation.

1. The width of the road.
2. The shape of the road-bed.
3. Foot-paths, &c.
4. Ditches.
5. The side slopes of the cuttings and fillings.

WIDTH.

The proper width for a road depends, of course, upon its importance, and the amount of travel upon it. Its minimum is about one rod, or 16½ feet, sufficient to enable two vehicles to pass each other with ease. For ordinary town roads a good width is from 20 to 25 feet. A width of 30 feet is fully sufficient for any road, except one which forms the approach to a very populous city.

Any unnecessary width (such as is often adopted in a spirit of public ostentation) is injurious, not only from its waste of land, but from its increase of the labor and cost of keeping the road in repair; each rod in width adding two acres per mile to the area covered by the road.

In the state of New York, by the revised statutes "All public roads, to be laid out by the commissioners of highways of any town, shall not be less than three rods wide."

This is to be the width between fences; and no more of it need be worked, or formed into a surface for travelling upon, than is deemed necessary.

The same laws declare, "It shall be the duty of the commissioners of highways to order the overseers of highways to open all roads to the width of two rods at least, which they shall judge to have been used as public highways for twenty years."

It is also ordered that "all private roads shall not be more than three rods wide."

Turnpike-roads are obliged by the statute to be "laid out not less than four rods wide," and "twenty-two feet of such width to be bedded with stone," &c. When a precipitous locality renders the full width impracticable, "twenty-two feet" is the minimum width permitted.

Where a road ascends a steep hill-side by zig-zags, it should be wider on the curves connecting the straight portions. The width of the roadway may be increased about one-fourth, when the angle between the straight portions of the zigzags is from 120° to 90°; and the increase should be nearly one-half, when the angle is from 90° to 60°.*

The Roman military roads had their width established by the laws of the Twelve Tables, at 12 feet when straight, and sixteen when crooked; barely sufficient for the army, baggage, and military machines.

The French engineers make four different classes of roads.†

The first class comprises such as pass from the capital of one country to that of another. Their width is 66 feet, of which 22 in the middle are stoned or paved.

Those of the second class pass from the metropolis of a country to its other great cities. Their width is 52 feet, of which 20 in the middle are stoned.

Those of the third class connect large towns with each other and with first-class roads. Their width is 33 feet, with 16 feet in the middle stoned.

The fourth class contains common town roads. Their width is 26 feet, with the same middle causeway as the last.

In England, the prescribed width for turnpike roads at the approach to populous towns is 60 feet. The limits of by-roads are, for carriage roads, 20 feet; for horse roads, 8 feet; and for foot paths, 6½ feet.‡

Telford's Holyhead road, a model road for a hilly country, has the following width in the clear within the fences; 32 feet on flat ground; 28 feet

* Mahan, p. 282.

† Gayffier, p. 90.

‡ Roads and Railroads, p. 73.

when there are side cuttings less than three feet deep and 22 feet along steep ground and precipices.

The United States National or Cumberland road has 80 feet in width cleared, but the road itself is only 30 feet.

The broken-stone road between Albany and Troy is 32 feet wide, besides two sidewalks of 8 feet each.

The "Third Avenue" of the city New York is 60 feet wide between the sidewalks, each of which occupies 20 feet; 26 feet of its middle are stoned.

Broadway, New York, is 80 feet wide between the houses, of which 19 feet on each side are occupied by the foot-pavements, leaving 42 feet for the carriage way.

When broken-stone roads are adopted, it is usual, for the sake of a saving in the first cost, to make only a certain width or "causeway," in the middle of the road, of the harder material, and to form the sides, or "wings," of the natural earth, (or of broken stone if the causeway be a pavement) which will be preferable in summer and for light vehicles and horsemen.† Sixteen feet for the middle and twelve for the sides is a common proportion.

If the stoned part be made narrower than just wide enough for two carriages to pass upon it, it should be made only wide enough for one; for any intermediate width will be a waste of all the surplus beyond what one requires.

If the road is to be made wider than two vehicles require, (which strictly is only 12 feet) it should be enlarged at once to 23 feet; for any intermediate width will cause unequal and excessive wear, and therefore be false economy; an unexpected conclusion, which results from an investigation of Gayfier, pages 184-8.

It would be preferable to place the harder material on the sides of the road, instead of on the centre; for the drivers of heavily-laden vehicles will generally keep them on the sides of the road, so that they can walk on the foot paths; and if this part be not of the hardest material, it will soon be cut up and rutted by the heavy wagons following each other on the same track.†

SHAPE OF THE ROAD-BED.

In forming the road bed, or travelled part of the road, the first and most important point, in a flat country, is to raise it above the level of the land through which it passes, so that it may be always perfectly free from water; a precaution which is one of the most essential requisites for keeping a road in good condition. Roads are often placed in a hollow-way, (or even a trench is dug, when better materials are to be added) and their surface is allowed to remain so low, that they form excellent gutters to drain the adjacent fields, at the expense of the comfort, labor, and time of all who travel them. Even the best ditches cannot always secure them from the land-springs, (which will sometimes pass under the ditches by fissures which form inverted siphons) and the only effectual means will be the raising of the surface by an embankment of two or three feet. The excavations for the ditches should invariably be thus applied.

The necessary elevation having been established, the shape of the road-bed, at right angles to its length or its "transverse profile," must be decided upon.

The road must not be flat, but must "crown," or be higher in its middle than at its sides, so as to permit the water of rains to rapidly run off into the side ditches. If originally flat, it is soon worn concave, and its middle becomes a pool, if it be on level ground; or a watercourse, if it be on an inclination. In the former case, the road becomes mud; in the latter, the smaller materials are washed away, and the larger stones left bare. Both these evils are of continual occurrence on our country roads, but may be easily prevented, by shaping the road according to the instructions to be presently given.

The usual, though improper, shape given to a road in order to make it crown, has been a convex curve, approaching a segment of a circle, or a flat semi-ellipse. Though recommended by high au-

† A serious objection to this plan is, that the wheels which cross the road, and are alternately on the stone and on the earth, will deposite earth upon the stone surface, to the great deterioration of its advantages.

† Parnell, p. 129.

thorities, it is very faulty, in consequence of its slope not being uniform, (the proportion between arcs and versed sines constantly changing) and giving too little inclination near the middle, and too much at the sides. From this peculiarity the following evils result:

1. The water stands on the middle of the road, and washes away its sides.

2. It is worn down very unequally: for all carriages, to avoid the danger of overturning on the steep sides, will take the middle of the road, which is the only part of it where they can stand at all upright; while the road ought, on the contrary, to be so formed as to induce vehicles to traverse it equally and indifferently in every part.

3. This excessive travel in the middle soon wears it into ruts and holes, so that more water will actually stand upon such an originally convex road than on one reasonably flat.

4. When carriages are forced to travel on the sides, they cause great additional wear to the road, from their constant tendency to slide down the sides, owing to the oblique angle at which the direction of gravity meets the surface.

5. As this sliding tendency is at right angles to the line of draught, the labor of the horses and the wear of the wheels are both greatly increased.

6. Whenever vehicles are obliged to cross the road, and mount the central ridge, they must overcome the same resistance of gravity, as when they are drawn up a longitudinal hill.

The best transverse profile for a road on level ground, is that formed by two inclined planes meeting in the centre of the road, and having their angle slightly rounded by a connecting curve.—The inclinations thus formed will be uniform, and the road will thus escape most of the evils incident to the curved profile.

The degree of inclination of these planes will depend on the surface of the road; being greatest where the road is rough, and lessening with its improvement in smoothness. It may also be somewhat less on a narrow road, as the water will have a less distance to pass over. Its maximum is limited by the inconvenience which an excessive transverse slope would cause to carriages. A proper medium for a road with a broken stone surface, is 1 in 24, or half an inch to a foot. Telford, in his Holyhead road, adopted 1 in 30, or 6 inches crown in a road of 30 feet; and McAdam 1 in 36, and even 1 in 60, or 3 inches in a thirty feet road. On a rough road the inclination may be increased to 1 in 20; and diminished on a paved road to 1 in 40, or 1 in 50.

Up to these limits the transverse slope should increase with the longitudinal slope of the road, which it should always exceed, in order to prevent the water running too far down the length of the road, and gullying it out; for the water of rains runs off from the middle of a road in the diagonal of a rectangle, the sides of which are proportioned to the steepness of the two slopes, longitudinal and transverse.

DITCHES.

The drainage of a road by suitable ditches is one of the most important elements in its condition. All attempts at improvement are useless till the water is thoroughly got rid of, and a bad road may often be transformed into a good one, by merely forming beside it deep ditches, sufficiently inclined to carry off immediately all the water which falls upon it. Even if water does not stand on the surface so as to form mud, if it filtrates from the higher land beside it, and from springs under it, and is not well drained off, it will weaken the substratum of the road so as to render it incapable of bearing heavy loads, and will be absorbed into the upper stratum by capillary attraction. If the road have a covering of broken stones, the water penetrating into it makes them wear away very rapidly by assisting the vibrating motion of their fragments; as lapidaries grind down the hardest stones by their own dust, with the aid of water.

The ditches should lead to the natural water-courses of the country; and should, if possible, have a minimum slope of one in a hundred and twenty-five, corresponding with the "minimum slope" of the road, though less will suffice if the bottom be truly cut and kept free from grass. They should generally be sunk to a depth of three feet below the surface of the road. Their size will be reg-

ulated by their situation, being greater where they intercept the water from side-hills rising above the road, and also where the country is humid. A width of one foot at bottom, with side slopes depending on the nature of the soil, will generally suffice. In wet soils the ditches should be so wide and deep, that the earth taken from them may be sufficient to raise the bed of the road between them three feet higher than the natural surface.

There should be a ditch on each side of the road on level ground, or in cuttings, and on the upper side of the road, or wherever it may be on a hill-side. The water from the side channels must be carried into these, and the contents of the ditches must pass under the road to the natural water-courses by means of drains, culverts, &c., as will be explained in chapter III. under the head of "Mechanical Structures."

WHAT ROADS OUGHT TO BE AS TO THEIR SURFACE.

QUALITIES DESIRABLE.

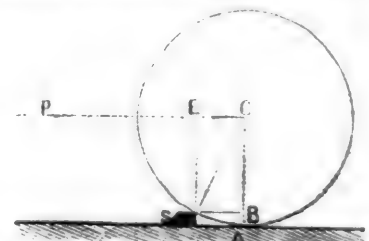
The surface of a road ought to be as smooth and as hard as possible, so as to reduce to their smallest possible degree the resistance of elasticity, collision and friction.

Smoothness is not only essential to comfort, but even more so to economy of labor, of carriage-wear, and of road-wear. Carriages passing over a smooth road are not only drawn more pleasantly, and with less exertion of animal strength, but also do much less damage to the road, than when it has hollows into which the wheels fall with the momentum of sledge-hammers, each blow deepening the hole and thus increasing the force of the next blow.

Hardness is that property of a surface by which it resists the impression of other bodies which impinge upon it. It is essential to the preservation of smoothness, except in the case of elastic surfaces.

RESISTANCES TO BE LESSENED.

Elasticity.—A road may be perfectly smooth, both before and after the vehicle has passed over it, but if it sink in the least under the passage of a wheel, this yielding presents before the wheel a miniature hill up which the vehicle must be raised with all the loss of power demonstrated on page 32. If the depression were one inch, and the wheel four feet in diameter, an inclined plane of 1 in 7 would be formed, and one-seventh of the entire weight would need to be lifted up this inch. A road surface of caoutchouc, or India-rubber, of the most perfect smoothness, would therefore be the worst possible for traction, though very pleasant for passengers. The wheels would always be in depressions, and the horses would be always pulling up hill. An elastic bottom for a road, such as a boggy substratum, would for this reason cause great waste of draught. A solid, unyielding foundation is therefore one of the first requisites for a perfect road.



The power required to draw a wheel over a stone or any obstacle, such as B in the figure, may be thus calculated. Let P represent the power sought, or that which would just balance the weight on the point of the stone, and the slightest increase of which would draw it over. This power acts in the direction CP with the leverage of BC or DE. Gravity, represented by W, resists in the direction CB with the leverage of BD. The equation of equilibrium will be $P \times CB = W \times BD$, whence

$$P = W \frac{BD}{CB} = W \frac{\sqrt{CD^2 - BC^2}}{CD - AB}$$

Let the radius of the wheel = $CD = 26$ inches, and the height of the obstacle = $AB = 4$ inches. Let the weight $W = 500$ lbs., of which 200 lbs.

may be the weight of the wheel, and 300 lbs. the load on the axle. The formula then becomes

$$P = 500 \frac{\sqrt{676 - 484}}{26 - 4} = 500 \frac{13.85}{22}$$

=314.3 lbs. The pressure of the point D is compounded of the weight and power, and equals

$$\frac{CD}{CB} = 500 \times \frac{26}{22}$$

=591 lbs., and therefore acts with this great effect to destroy the road in its collision with the stone, in addition to its force in descending from it. For minute accuracy, the non-horizontal direction of the draught, and the thickness of the axle, should be taken into the account.

The power required is lessened by proper springs to vehicles, by enlarged wheels, and by making the line of draught ascending.

The resistance produced by the hollows between the stones of a pavement is of a different nature.—According to the investigations of M. Gerstner, the resistance arising from such a surface is directly proportional to the load, to the square of the velocity, and to the ratio of the width of the cavity to the radius of the wheel; and inversely proportional to the width of the paving stones.

To be continued.

HOGS KILLED IN THE WEST—1849-'50.

From the best information he could obtain, by personal inspection and otherwise, Mr. L. Caldwell has published in the Lafayette, Indiana, Courier of February 26th, a statement of the number of hogs slaughtered in the west during the past season. His aggregates are as follows:

Recapitulation.

Ohio.....	523,755
Kentucky.....	198,000
Indiana.....	428,575
Illinois.....	268,100
Mississippi river.....	252,900
Missouri river, es't.....	75,000
Cumberland river, es't.....	100,000
Other small points overlooked.....	25,000

Grand total.....1,871,330

Alabama.

The Mobile Advertiser says: "The prospects for railroads in this State are brightening every day. Messrs. Connolly & Parham, agents for the Tennessee railroad, write from the upper portion of the State very cheerfully as to the prospects for the final completion of the enterprise. Meetings are being held in Talladega, Benton and Shelby counties, with a view of arousing the people to action, and to obtain subscriptions to the stock. A single planter in Talladega offers to take \$20,000 worth of the stock, and the opinion seems generally to prevail, that the counties through which the road is to run will subscribe enough to carry the road through them. They certainly will if they understand their own interest.

The Memphis and Atlanta railroad is commanding almost the entire public attention in north Alabama. Some of the ablest men they possess, in that part of the state, have been canvassing every county on the projected line of the road, and with a success fully equal to their expectations.

Preparations are also in a state of forwardness for surveying and locating the Girard and Mobile railroad. This road, when completed, is destined to be the great thoroughfare between New Orleans and New York. Its prospects, too, appear good for a final completion. If the planters living on the line redeem their pledges—and who doubts it?—the road must go through.

This brings us to the Mobile and Ohio railroad. The stockholders of this gigantic undertaking

have good and sufficient cause for congratulation, in view of their flattering position. Every step now made by the directors is upward and onward.—In addition to the large amount of stock subscribed by individuals, the city takes \$300,000 worth; and if the State of Mississippi passes into laws the bills at last date before the Legislature, the position of this road will be as good as its best and most ardent friends could ask. Indeed, its prospects without the aid of the Mississippi Legislature may be put down as certain. The first hundred miles secured, and the Mississippi counties will take it up, and never drop it until it reaches Tennessee."

California Gold.

We copy from the Philadelphia American the following statistics, showing the receipts of California gold up to the present time. They are derived from the Treasurer of the U. S. Mint, in that city:

United States Mint, Philadelphia.

Total amount of California gold received up to the 28th February, '50 as per last report.....	\$8,500,000
Receipts from the 1st to the 15th March, 1850.....	825,000
Amount of gold dust on hand, but not weighed, estimated at.....	150,000

Total.....\$9,475,000

Branch Mint, at New Orleans.

Total receipts up to 1st of January, 1850, as per last report.....	\$668,079
Receipts during January, 1850.....	376,512
Do. February, 1850.....	561,538
Estimated receipts from the 1st to the 15th March, 1850.....	300,000

\$1,904,129

Recapitulation.

Receipts at U.S. Mint, Philadelphia.....	\$9,475,000
do. Branch Mint, New Orleans.....	1,904,129

Grand total.....\$11,379,129

To which may be added, say \$750,000 worth of gold dust still remaining in private hands. It would thus appear that the total amount of California gold received into this country from the first consignment, in 1848, up to the present time, exceeds the truly enormous sum of twelve millions of dollars;—but, enormous as it is, still much below the popular estimate.

The coinage at the Mint during the present quarter has been very heavy, as may have been inferred from the number of certificates paid. About \$100,000 of double eagles have been coined and issued, and a still larger amount will be coined in the course of a few days.

THE MONEY KING.

Nathan Mayer Rothschild undoubtedly while living, was more courted than any King in the world. He was literally the King of Kings—for he held the sinews of war and peace in his own hands, and could bear up a despot when even his own people were against him. Mr. Rothschild resided in London—where by the mere power of money he was feted and caressed by the most refined aristocracy in the world. He was descended from an abhorred race—the Jews—who could not sit even in the House of Commons. Yet Princes and Dukes eagerly sought to attend the banquets of the Hebrew—simply because he was rich.

Mr. Francis, in his recent history of the Bank of England, makes the following understandable remarks. The personal appearance of Rothschild was very repulsive, and thus he was worshipped for his mere wealth. Even his mental endowments were obscured by his overwhelming passion for money. He says:

"The language which Mr. Rothschild could use when his anger overbalanced his discretion, was a license allowed to his wealth; and he who, when

placed in a position which almost compelled him to subscribe to a pressing charity, could exclaim, 'Here write a check—I have made one—fool of myself!' was courted and caressed by the clergy, was feted and followed by the poor, was treated as an equal by the first minister of the crown, and more than worshipped by those whose names stood foremost on the roll of a commercial aristocracy. His mode of dictating letters was characteristic of a mind entirely absorbed in money-making; and his ravings, when he found a bill unexpectedly protested, were translated into mercantile language before they were fit to meet a correspondent's eye."

LOOK ON THIS PICTURE AND ON THAT.

It is known to all the world that immense fluctuation has taken place in the price which the share market affixed to railway shares in 1845 compared with that which it affixes in 1850; but still it may not be a minute misspent to look at the following pictures, for the sake of the contrast:—

Prices quoted, Aug. 20, 1845.

London and North Western £100 paid.....	£225
Great Western, £80 paid.....	212
York and North Midland, £50 paid.....	108
Midland, £100 paid.....	172
Caledonia, £25 paid.....	10½
Oxford, Worcester, and Wolverhampton, £2½ paid.....	7½
Brighton, £50 paid.....	76

Prices quoted, Feb. 2, 1850

London and North Western, £100 paid.....	116
Great Western, £100 paid.....	68
York and North Midland, £50 paid.....	18½
Midland, £100 paid.....	44
Caledonia, £50 paid.....	12
Oxford, Worcester, and Wolverhampton, \$50 paid.....	10
Brighton, £100 paid.....	83

The causes of this greivous fluctuation are also pretty well known. The principal are—mismanagement, Parliamentary oppression, shareholders' weakness and folly, and the public's want of confidence.—*Herapath's Journal.*

Mississippi.

The Vicksburg Sentinel gives a synopsis of the report of the commissioners of the Southern railroad. It says:

The following figures exhibit at a glance the disposition which has been made of the funds drawn from the treasury:

Received from 2 per cent. in State treasury.....	\$201,180 40
Premium on U.S. Treasury notes....	6,114 50

Total.....\$207,294 90

Deduct amount paid on account of Jackson and Brandon railroad and Bridge Co.....	\$7,016 41
Amount in hands of B. G. Weir.....	4,679 05
Amount of cost of negroes, horses, carts, engines and cars, as per statement B.....	78,883 87

90,529 34

Leaving the sum of.....\$116,765 65

Which may be considered the amount actually expended in the construction of 13½ miles of road, (leaving a surplus of two miles of railroad iron) being at the rate of \$8,649 30 per mile, including all expenditures for graduation, superstructure, bringing railroad iron, and the erection of the depots at Jackson and Brandon.

Iron Permanent Ways.

A series of experiments have been carried out by Mr. P. W. Barlow, C. E., from which he has been led to recommend the substitution of cast iron in place of wood in laying the superstructure of permanent way, as the only means of preventing those irregularities of surface which cause blows to be given by the engine that are not only annoying to passengers, but further, and more and more rapidly destructive to the way and to the carriages, as well as wasteful of the locomotive power and mechanism. The present practice he regards as temporary way much more than permanent. Mr. Barlow

finds it to be a mistake, that a partially soft elastic material such as wood is requisite to smooth and easy motion; the more rigid, and level, and polished the surface, the easier has he found the traction, and the better suited at least to railway transit.—Cast iron sleepers in two halves, with half chairs fitting the rail, and bolted together so as to avoid the use of the key, is that construction of superstructure to which experiment has led him to yield the preference, from the facility with which it is laid, from the perfect joint which it gives, and the security from breakage in the event of getting off the line. The point of the meeting of the plates is situated between the chairs, so that the bolts act under a spring which destroys all liability of loosening, to which he has found any tendency.—*Report to the Directors of the Southeastern Railway Company on Permanent Way; by P. W. Barlow, C. E.*

THE COAL TRADE FOR 1850.

The quantity sent by railroad this week is 15,347.14 tons. About 200 tons have been shipped by the canal.

The freight to Philadelphia by canal has opened at 60 cents. Nothing definite has transpired with regard to freight to New York. Boatmen want last year's prices, but shippers are offering less. So far no coal has been shipped to N. York by canal. The freight on coal from Richmond to New York, at present, is 80 cents per ton.

The Beaver Meadow company, and we believe all the companies on the Lehigh, have fixed their prices as follows, on board at Bristol; Lump, \$3 75; Egg, \$3 87½; and Stone, \$4 per ton. These are fair and remunerative rates, and if adhered to, will add life and vigor to that portion of the Anthracite region. Some of our operators we regret to learn, have been offering coal at much lower rates, but without effecting sales. Dealers will not purchase at this season at any price, except to supply their immediate wants; and low offers, under such circumstances, only have a tendency to induce purchasers to hold off longer, and retard sales.

From inquiry we learn that in some sections of this region, nearly, if not quite, one half the miners and laborers have moved from the country, and unless wages advance to the rates paid elsewhere, they will not return—and if the wages are advanced here it is utterly impossible to sell coal as low as some parties are offering it. Such a policy cannot be condemned too strongly; and if they should be caught and suffer losses in consequence, they need not expect much sympathy in this region,—for we hold that it is absolutely and morally wrong for any person to sell coal, or any other article in advance, unproduced, and depend upon labor producing it, at a less rate than will afford a fair return to that labor which is to be engaged in its production, unless it is done under circumstances which we do not believe exist even now in the present depressed state of the trade.

One of our operators who has returned from a tour through the eastern markets, states that the supply of coal in market is considerably reduced from what it was at this period last year, and that many dealers are entirely out.—*Pottsville Journal.*

THE PACIFIC RAILROAD ENTERPRISE OUTDONE.

The London Times reviews the prospects of a scheme for constructing a railroad connecting the two stations of Calais in France, to Mooltan India. The Times says:

"In point of fact, the distance between England and India is of a very fabulous and artificial character. It used to be called 10,000, 12,000, or even 15,000 miles. The time consumed in traversing it has been varied from nine months to three. At the present time the journey from Bombay to Southampton is usually performed in 35 to 40 days, and there seems to be abundance of room for still further shortening the transit. For, after all, when we look at the plain facts of the case, India is only some few hundred miles further from us than the United States, though we have come to consider the latter country as lying at our doors, while we still regard the former as one of the utmost parts of the earth. From Spithead to New York it is 2820 miles; from Ostend to Hyderabad, on the Indus, it is only 3805. The estimated cost of this enterprise

is put down at £34,050,000! The terminus of the railway is to be in Belochistan—a country, the Times tells its readers, 'which is bounded on the north by Afghanistan, on the west and east by Persia and F. India, and on the south by the Arabian Sea, and tenanted by an indefinable race, living under no describable government.'

Maine.

The Railroad up the Kennebec.—The grading on the Kennebec and Portland railroad is to be prosecuted the coming season with all possible despatch. The cars are expected in Gardiner and perhaps Augusta, by the first of January, 1851.

The timber has been put up on the Androscoggin bridge at Topsham, the past winter, and there is nothing to prevent the completion of that bridge in two or three months. The bridge at Bowdoinham is nearly finished—what remains to be done can be accomplished in a very short time. The road is nearly all graded from Brunswick to Richmond village; and from Richmond to Augusta, about three hundred men are now employed in grading and stone work. In Gardiner, the steam shovel is fast working through the gravel hill on the south side of the village, and the embankment across the causeway, is fast filling up. In Hallowell, an alteration has been made in the grade through the village, which will save the company \$30,000, and afford better satisfaction to the citizens of that town. The heavy embankment beyond Hallowell, is half finished, and the line half graded to Augusta.

Engine Drivers.

The fact that five explosions of locomotive engines have occurred within one year's time upon the railroads of this country, a majority of which have been attended with most fatal consequences, which should arouse the attention of the managers of railroad companies, and lead to the adoption of efficient measures to guard against such disasters. The first point to examine into is as to the character and qualifications of the men who have charge of engines. These men should be well educated in their calling, and kept constantly informed upon all questions affecting their business. The engine driver should be the best informed mechanic on the road. A large portion of the repairs on some roads arise from the want of proper skill and judgment on the part of the engine drivers. There is as much difference in the wear of an engine as there is in the wear of a horse. Those companies that furnish their engine drivers with suitable books and other means of information are amply repaid in the greater skill and more faithful performance of duty in those thus supplied with the means of knowledge. Every company could easily arrange this matter, and at once commence a most satisfactory system of training, among the various persons in their employ. Either require every man who works upon, or takes charge of a locomotive to furnish himself with the most valuable publication to be had touching upon the duties of his trade, or furnish the same to him at the expense of the company. One or the other of these things should be done. There is no danger but what such works would be read and studied. If not, then certainly the man who has so little love for his business or profession is unfit to take charge of a locomotive. Every day brings some valuable hints to the inquiring mind; suggesting remedies for existing defects, or pointing out new and more approved methods to accomplish certain results. These results are constantly appearing in various forms in the journals of the day. By close attention to these suggestions the faithful mechanic every day becomes more useful to his employer, is imbued with a higher moral, and becomes happier in the consciousness of his own advancement.

We say this as the conductors of an independent

Journal, devoted to the railway interests and the practical sciences. There are many works and journals in the country which could be read with profit by all, and should be studied with care by all who have practical duties to perform upon railroads. Among this number our Journal may claim consideration, and the conviction of the importance of these general ideas, leads us to give increased attention to this particular department of railway economy. This number of the Journal furnishes a specimen of the character of certain articles we have furnished to us, from one fully competent to write on all these matters.

Georgia.

Milledgeville Railroad.—The Recorder says:—"At a meeting of the stockholders of the Milledgeville and Gordon railroad company, held on Saturday last, the following gentlemen were elected Directors, viz: George L. Deming, J. U. Horne, I. L. Harris, and Isaac Newell: the mayor of the city John H. Brown, Esq., the director on the part of the city council.

At a subsequent meeting of the board, George L. Deming, Esq., was elected president.

Maine.

Androscoggin Railroad.—The work of grading on this road is progressing rapidly. Some 30,000 yards of earth were removed last month, and we are assured that the same or a larger amount will be removed the present month. The directors are about to take measures to secure the means for furnishing the road, and it is hoped they will be able to put that portion of their road now under contract, into running condition within a year.

New York.

Contractors.—Allotment of work on the New York and Erie Railroad;—

Reed, Tracy & Co.....	24 miles
King, Lauman & Co.....	12 "
Case, Barker, Gonder & Co.....	26 "
Wright, Mallory & Smith.....	12 "
Sherl, Lansing & Co.....	6 "
Sharp & Lankin.....	9 "
Britton, Smith & Co.....	16 "
Dimmick, Weed & Co.....	7 "
Scott, Wells & Co.....	7 "

The new locomotive, *Cleveland*, the first of the dozen contracted to be built at the Cuyahoga Steam Furnace, for the Cleveland, Columbus and Cincinnati railroad company, is on the track. It is large and powerful, and a most beautiful piece of work. The steamboat engines built at the Cuyahoga Works are unsurpassed by any, and good engineers express the opinion that this, the first locomotive turned out for the C. C. and C. road will perform admirably.—*Cleveland Herald.*

Georgia.

☛ Nine new locomotives have lately been ordered at the North for the Central & South Western Railroads—six for the former and three for the latter roads. Of these three are from the workshop of HINKLEY & DRURY of Boston, two from Rogers, KETCHUM & GROSVENER of Patterson N. J. three from BALDWIN of Philadelphia, and one from Messrs. NORRIS. The freight Engines weigh about 30 tons, passenger, 16 tons.

NOTICE TO SUBSCRIBERS.

Such of our Subscribers as wish for back numbers of our paper to complete their sets, or who may not have received the index of the past year, are requested to send for them without delay.

Table of Railroads

(No. 1.) STATISTICAL TABLE. 1849. NAMES OF ROADS.	Road.				Equipments.					Miles Run.		No. of Passengers.	
	Total length	Length of sing. track.	Length of double T.	When laid.	Weight of rail per yard.	No. shops & engine houses.	No. of engines.	No. of pass. cars.	No. of other cars.	By pass. trains.	By freight trains.	Through.	Way
Albany and Schenectady.....	17	17	9	'44 '48 '49	58	5	6	60	77	50,871	31,135	249,810	.....
Albany and West Stockbridge.....	38½	38½	2½	.....	56	2	.....	.....	.....	53,126	135,970	101,911	40,476
Attica and Buffalo.....	31½	31½	.....	'47 '48 '49	62	5	6	7	67	99,875	.....	171,823	18,285
Auburn and Rochester.....	78	78	.....	'48	67	4	19	20	100	196,634	125,667	140,088	141,868
Auburn and Syracuse.....	96	26	29	'48	61	1	8	8	41	61,724	30,238	192,161	17,573
Buffalo and Niagara Falls.....	22	22	.....	'45 '49	57	3	.....	10	8	15,696	.....	82,191	19,479
Cayuga and Susquehanna.....	28	28	.....	'49	58	.....	2	4	62	12,480	7,280	4,056	.....
Chemung.....	17½	17½	.....	'49	58	.....	.....	.....	.....	.....	.....	.....	.....
Hudson and Berkshire.....	31½	31½	.....	'48 '49	56	2	3	4	40	57,140	.....	2,713	27,915
Hudson River.....	75	75	.....	'49	70	2	10	25	71	22,345	.....	79,869	.....
Lewiston.....	3½	3½	.....	'37	15	3	none.	6	3	7,792	.....	34,204	.....
Long Island.....	98	98	3	'44	48	6	15	19	120	112,024	80,994	168,443	.....
New York and Erie.....	294	204	9	.....	56 & 60	9	50	39	550	303,961	338,782	12,303	270,359
Northern.....	.....	30	.....	'49	60	1	5	2	119	.....	.....	.....	.....
Oswego and Syracuse.....	35	35	.....	'48	58	1	4	5	41	43,020	16,880	32,011	33,042
Rensselaer and Saratoga.....	25	25	.....	.....	58	2	4	10	21	48,749	7,808	85,662	24,171
Saratoga and Schenectady.....	22	22	.....	.....	.....	2	2	2	6	23,704	.....	17,273	85,735
Saratoga and Washington.....	39½	39½	.....	'48 '49	56	3	5	8	48	53,920	.....	54,127	35,516
Schenectady and Troy.....	20½	20½	.....	'42	56	3	4	6	43	58,209	12,629	51,962	3,674
Skaneateles and Jordan.....	5	5	.....	'45	10	none.	none.	2	3	8,970	6,760	4,610	2,900
Syracuse and Utica.....	53	53	53	'47 '48 '49	61 & 70	6	16	21	196	136,528	132,000	196,225	98,192
Tioga Coal, Iron, Mining and Manuf.	15	15	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Tonawanda.....	43½	43½	.....	'47 '48 '49	61	4	7	12	91	104,182	52,206	144,800	50,141
Troy and Greenbush.....	6	6	.....	'45	56	1	3	3	10	49,126	9,464	205,465	.....
Utica and Schenectady.....	78	78	78	'47 '48 '49	65	6	18	.....	200	177,744	122,726	214,918	118,043

(No. 2.) COST OF RAILROADS IN 1849. NAMES.	Amounts Paid for				Amounts Paid for				Amounts Paid for	
	Capital stock.	Amount called and paid in.	Whole cost of road.	Lands.	Grading.	Engineering.	Bridging.	Masonry.	Iron, and for superstructure.	
Albany and Schenectady.....	1,000,000	1,000,000 00	1,698,284 78	.....	.....	.....	.....	.....	298,452 62	.....
Albany and West Stockbridge.....	1,000,000	1,000,000 00	1,930,895 01	210,201 00	895,090 10	232,166 40	.....	.....	400,612 07	.....
Attica and Buffalo.....	800,000	800,000 00	870,648 56	180,102 88	124,688 14	10,496 21	22,484 92	.....	1,203,213 73	.....
Auburn and Rochester.....	2,151,765 00	2,968,837 15	184,059 95	641,690 70	50,539 60	101,530 39	91,185 37	.....	373,619 67	.....
Auburn and Syracuse.....	.....	624,000 00	1,397,427 46	86,487 76	298,715 38	33,337 57	8,760 48	36,045 54	195,780 23	.....
Buffalo and Niagara Falls.....	393,750	256,250 00	.....	133 80	106,600 49	4,806 16	14,609 03	.....	.....	.....
Cayuga and Susquehanna.....	.....	118,000 00	.....	.....	.....	.....	.....	.....	.....	.....
Chemung.....	380,000	375,000 00	445,000 00	.....	.....	.....	.....	.....	.....	.....
Hudson and Berkshire.....	450,000	375,000 00	819,631 45	64,261 31	660,593 97	.....	.....	.....	811,627 48	.....
Hudson River.....	3,281,500	3,157,175 00	5,003,675 39	459,294 62	2,892,681 24	144,855 59	.....	.....	15,467 99	.....
Lewiston.....	50,000	27,000 00	30,052 19	1,068 79	5,376 26	817 46	.....	.....	.....	.....
Long Island.....	.....	1,781,494 46	2,091,341 59	.....	.....	.....	.....	.....	1,734,373 50	.....
New York and Erie.....	10,500,000	5,778,891 00	16,430,868 63	557,096 60	5,883,242 47	307,736 31	.....	.....	477,611 17	.....
Northern.....	2,000,000	1,329,517 59	1,863,291 34	55,534 06	927,981 43	91,477 98	51,514 88	.....	243,797 22	.....
Oswego and Syracuse.....	350,000	350,000 00	548,353 08	38,846 53	187,274 94	14,071 29	9,179 12	.....	.....	.....
Rensselaer and Saratoga.....	300,000	300,000 00	674,798 97	.....	.....	.....	.....	.....	.....	.....
Saratoga and Schenectady.....	.....	386,304 25	.....	.....	.....	.....	.....	.....	.....	.....
Saratoga and Washington.....	850,000	781,300 00	1,102,505 65	85,444 40	531,650 57	23,153 61	.....	.....	279,779 47	.....
Schenectady and Troy.....	650,000	650,000 00	672,910 25	84,750 58	221,296 85	29,582 23	22,440 69	76,033 19	135,049 47	.....
Skaneateles and Jordan.....	25,000	25,000 00	28,361 60	.....	.....	.....	.....	.....	.....	.....
Syracuse and Utica.....	2,000,000	1,802,100 00	2,363,043 55	141,894 78	369,829 50	38,747 96	109,180 85	.....	1,103,466 78	.....
Tioga Coal, Iron, Mining and Manuf.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Tonawanda.....	1,000,000	950,000 00	974,865 66	.....	.....	.....	.....	.....	.....	.....
Troy and Greenbush.....	274,400	274,400 00	275,425 93	.....	.....	.....	.....	.....	.....	.....
Utica and Schenectady.....	3,560,000	3,494,010 00	4,006,428 02	389,386 39	671,927 82	69,806 33	82,565 35	162,129 16	1,797,470 00	.....
Watertown and Rome.....	1,500,000	237,829 46	221,961 39	17,630 93	98,729 51	14,752 18	6,370 80	28,841 89	50,000 00	.....

(No. 3.) EARNINGS AND EXPENSES DURING 1849. NAMES.	Amounts Received from				Amounts Expended for					
	Passengers.	Freight.	Mails.	Interest.	Other sources.	Repairs of roadway.	Repairs of buildings.	Repairs of passenger cars.	Repairs of freight and other cars.	Fuel.
Albany and Schenectady.....	115,717 59	62,550 02	2,650 00	.....	3,111 44	6,222 28	.....	.....	.....	16,759 03
Albany and West Stockbridge.....	.....	.....	.....	.....	.....	18,183 89	6,420 58	.....	.....	.....
Attica and Buffalo.....	144,519 23	28,523 60	5,107 06	1,284 12	8,662 95	2,021 34	1,118 77	.....	*8,349 97	7,500 55
Auburn and Rochester.....	408,424 90	111,579 72	5,670 00	.....	2,189 21	21,637 72	1,718 43	27,634 82	.....	44,954 98
Auburn and Syracuse.....	150,163 64	37,392 98	1,813 73	.....	4,387 49	17,550 18	2,336 03	7,981 93	.....	17,814 52
Buffalo and Niagara Falls.....	47,766 65	3,813 57	900 00	.....	.....	2,111 54	61 54	.....	.....	2,576 84
Cayuga and Susquehanna.....	4,823 39	7,818 80	.....	.....	.....	.....	.....	.....	.....	.....
Chemung.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Hudson and Berkshire.....	13,111 72	24,315 57	.....	.....	400 00	6,376 02	229 06	707 32	.....	5,461 81
Hudson River.....	31,036 74	.....	.....	.....	46,301 63	.....	.....	1,286 46	.....	12,765 30
Lewiston.....	7,924 86	667 75	216 67	.....	128 50	554 26	.....	288 81	.....	.....
Long Island.....	108,823 78	44,881 30	7,610 00	.....	.....	.....	.....	.....	.....	.....
New York and Erie.....	363,209 96	425,078 12	21,489 42	.....	366 12	61,640 44	.....	.....	.....	60,559 91
Oswego and Syracuse.....	48,877 50	6,475 99	528 02	.....	1,638 12	13,419 40	.....	.....	.....	7,028 38
Rensselaer and Saratoga.....	81,790 92	19,453 52	870 33	.....	19,093 87	8,282 23	129 82	.....	.....	5,496 65
Saratoga and Schenectady.....	24,361 29	10,140 22	495 47	.....	1,565 96	9,679 59	392 73	.....	.....	1,545 76
Saratoga and Washington.....	75,592 54	10,426 72	2,500 00	.....	930 13	.....	.....	.....	.....	8,657 65
Schenectady and Troy.....	26,693 02	19,610 60	684 50	.....	656 32	10,549 40	.....	.....	.....	7,490 93
Skaneateles and Jordan.....	1,805 52	1,703 31	130 00	.....	590 60	.....	.....	.....	.....	.....
Syracuse and Utica.....	326,525 67	97,858 40	5,414 65	.....	35,004 24	26,395 81	.....	11,376 17	9,933 37	22,656 71
Tonawanda.....	189,284 14	60,014 63	7,295 92	2,680 34	91,256 02	11,407 71	101 89	*2,118 56	.....	12,664 66
Troy and Greenbush.....	30,990 15	25,107 52	582 48	.....	527 64	4,224 75	378 64	.....	.....	5,115 69
Utica and Schenectady.....	533,953 28	251,033 77	7,969 64	15,676 46	16,638 40	41,110 31	14,903 90	20,400 16	24,975 20	28,193 75

* Cars of all kinds.

in the State of New York.

Rate of Fare Per Mile.				Amount of Freight in Tons.								Av. Speed p.h.		Av. No. men employed.	No. Persons		REMARKS.
Class 1. cts.	2. cts.	3. cts.	4. cts.	Total.	Forest.	Animal.	Vegetable.	Other agriculture.	Manufactures.	Merchandise.	Other.	Pass. trains.	Frgh't trains.		Kil'd.	Inj'd.	
3	1-8			51,261	1,679	15,409	6,924	1,101	3,962	16,230	5,956	25	15	130	none.	none.	Road leased to W. Railroad Mass.
3	2-4			155,415	6,356	21,214	84,252	948	11,537	3,659	27,449	22	15		none.	none.	
3	1-8	1-5		14,458	413	4,721	2,103	685	742	4,329	1,465	26	16	80	2	none.	
3½	2	1-5		36,234								25	15	279	11	1	
3-07	1-84	1-6	1-53	5,689	198	888	1,460	75	1,040	856	1,172	26	12	152	5		
2-4												20		28	none.	none.	Leased to New York & Erie.
3-5				6,690	4,179			257	857	400	977				2	none.	
				21,828	1,718	1,236	4,507	462	6,160		7,746	20	12	75	2	none.	
1½				none.								30		181	2	2	
7½	6½			1,335										15	none.	1	
2				Irreg'r.										160	1	1	Not opened.
2	1½			109,402	10,468	27,480	9,377	670	12,128	32,203	17,076	22	12		10	13	
															6		
2-4-5												19	10	75	1	1	
3				12,376	814	1,298	2,178	197	2,143	3,602	2,144	24	15	56	1	11	
3½				4,988	595	209	1,073	36	484	1,190	1,401	15		30	none.	none.	Road leased.
3	2			7,452	330	1,111	922	88	636	2,751	1,615	22			3		
2½	1½			18,382	616	4,353	7,431	365	1,039	2,322	2,256	25	15	46	none.	none.	
6				2,450	453	132	138	5	665	248	809			5			
2-83	1-88	1-51										25	12	339	12	2	
3	1½	1½		20,661	998	1,538	11,563	294	451	3,645	2,172	22	15	238	2	1	Road leased.
2½				37,971	2,696	7,994	12,436	762	4,671	885	8,527			49	1	none.	
2-88	1-88	1-6	1-4	26,677	1,149	4,540	4,341	830	4,754	4,455	6,608	28	15	450	3	1	

Buildings.	Amounts Paid for				Indebtedness		Amount due the corporation.	Amount paid for construct'n in 1849.	REMARKS.
	Engines.	Pass. cars.	Freight & other cars.	Other items.	Bonds.	Floating debt.			
294,982 90	552,000 00	93,088 08	Leased to "West." of Mass.
24,271 94	60,152 00	*47,840 40	....	....	....	930,895 01	....	6,193 34
105,250 26	144,776 00	21,800 00	60,000 00	361,791 15	638,000 00	67,176 43	33,313 07	49,334 69	
22,633 67	57,081 03	16,894 40	28,398 83	235,453 13	375,000 00	60,000 00	....	125,000 00
6,550 00	34,320 69	*18,240 71	....	....	46,670 00	30,000 00	13,318 91	697 79
....	25,886 15	154,513 84	Leased to New York & Erie.
....	....	....	....	....	....	253,000 00	3,374 71	68,011 42
20,734 23	35,538 29	*38,503 65	....	....	70,000 00	5,000 00	5,000 00	....
220,833 98	15,294 47	*71,648 76	....	387,439 25	1,867,635 00	41,549 92	3,000 00	23,154 25
750 00	horses, 1,535 00	4,886 40	....	250 31	....	88,101 12	79,150 00	....
....	70,500 00	2,120,841 59	447,563 96	308 44	100 00	[included. \$3,000,000 state loan, not Not opened.
270,273 89	402,322 88	98,011 97	287,238 13	....	*5,839,918 90	35,426 05	8,275 15	1,801 78
21,895 30	29,635 78	*47,000 60	....	160,600 14	388,100 00	2,481,647 41	23,507 12	4,813,142 27
7,978 73	18,000 00	10,596 50	18,971 88	3,636 82	182,000 00	313,957 03	118,094 96	....
....	....	....	....	....	185,500 00	22,906 07	1,500 00	....
36,457 39	29,000 00	*21,043 75	95,976 46	334,500 00	65,365 00	22,888 04	Road leased.
9,416 26	30,925 16	*35,924 27	....	27,491 55	....	35,000 00	....	55,267 88
....	....	....	....	....	....	53,519 81	584 00	13,241 41
104,536 65	113,189 71	*125,570 57	....	126,626 75	80,000 00	41,300 80	15,574 00	388,798 10
....	....	....	....	....	152,000 00	51,153 48	69,404 67	176,102 57
227,662 00	241,668 27	*301,292 70	62,500 00	102,500 00	10,813 42	4,413 76	Not opened.
....	....	....	....	5,636 08	....	....	95,553 68	350,777 16

Taxes.	Oil.	Amounts Expended for				Other expenses.	State tolls.	Amount charged for depreciation.	Dividends.		REMARKS.
		Salaries of officers and agents.	Conductors and brakemen.	Engine and firemen.	Interest.				No.	Amount.	
4,094 38	3,820 82	35,909 98	35,597 04	8,335 60	2	70,000 00	Leased to "West." of Mass.
5,985 79	....	....	....	....	....	4,306 03	....	....	....	....
5,298 63	3,588 57	14,442 61	3,069 94	6,104 33	21,008 26	15,983 76	26,121 99	22,105 40	2	53,585 00	
8,650 36	10,412 86	21,603 06	10,200 00	10,938 25	3,922 38	9,028 09	8,934 38	....	2	188,536 00
2,674 68	2,747 78	7,623 59	5,336 24	6,775 99	26,152 40	23,017 29	8,898 88	....	2	45,000 00
1,160 62	719 38	2,465 06	840 00	958 13	1	7,997 33	Leased to New York & Erie.
....	....	....	....	....	....	....	....	....	1	1,800 00
454 73	....	6,377 64	1,222 49	1,778 80	20,500 00	2,706 88	....	....	....	....
....	662 64	....	6,318 92	1,618 91	....	2,207 76	....	....	....	....
....	....	....	....	....	26,172 45	5,227 74	....	....	1	\$3 75 persh.
....	27,654 33	39,307 78	40,091 53	34,351 61	71,910 96	2	291,595 83	Leased to New York & Erie.
3,414 03	632 68	2,723 10	1,996 55	2,794 04	10,356 32	3,191 73	....	....	....	....
1,903 26	1,917 31	....	....	....	11,235 00	48,041 04	....	....	2	30,000 00
....	585 70	....	....	....	....	12,906 94	....	....	....	....
3,890 07	2,907 88	....	1,637 28	2,578 90	....	22,236 50	2,568 54	....	....	....
1,726 50	1,451 55	5,043 78	1,560 00	3,296 00	807 09	12,863 96	3,032 28	Leased to New York & Erie.
....	....	....	....	....	....	3,229 48	....	13,361 60	....	1,000 00
11,627 24	6,653 80	8,716 36	13,720 38	12,815 66	5,705 00	15,219 40	24,639 36	30,000 00	3	9 per ct.	
3,635 60	2,933 93	4,890 00	4,170 77	5,358 00	9,612 81	27,418 50	2,224 09	....	2	7,400 00
806 40	1,019 86	1,800 00	....	5,072 47	283 34	21,893 77	....	....	....	3 per ct.
22,522 42	5,237 74	4,766 64	9,616 93	12,732 71	....	108,703 26	49,221 57	....	2	333,015 50

* Cars of all kinds.

AMERICAN RAILROAD JOURNAL.

Saturday, March 30, 1880.

F. M. Ray's India Rubber Spring.New York and Erie Railroad Shops.
Piermont, March 26, 1880.

This will certify that from practical experience in the use of Fowler M. Ray's India rubber Car Springs, I believe them to be far superior to any others now in use.

I have never known them to be affected by any change of temperature, as other Rubber Springs have been affected on this road.

I am at the present time repairing a Passenger Car that Mr. Ray and myself mounted with his springs about two years and eight months since.

The springs are at the present time as perfect, to all appearances, as when first applied to the car.

Respectfully yours,

HORACE B. GARDNER,
Foreman of the Car Shops.

Old Colony Railroad Office,
Boston, March 6, 1880.

EDWARD CRANE, Esq.,

President New England Car Co.,

Dear Sir: In compliance with your request I would state that the Old Colony Railroad Company have had in use upon their road, India-rubber Springs furnished by your company, for more than eighteen months past, during which time they have been extensively used under Passenger and Freight Cars, Locomotive Tenders, and for Drawer and Buffing Springs, with the most perfect success. The elasticity and consistency of the Rubber has never been unfavorably affected by either extremes of heat or cold—and from the experience which we have had in the use of Rubber Springs, I think them well adapted for railroad purposes—and therefore we have for some months past used Rubber almost exclusively, in all places where springs are required.

Respectfully yours, etc.,

JAS. H. MOORE,
Supt. O. C. Road.

February 25, 1880.

From practical observation of the use of the India-rubber Car Springs, manufactured and sold by your company, we are entirely satisfied in their application, and do not hesitate to recommend them as elastic, durable, requiring no repairs for years, and retaining their consistency during all extremes of weather. We have applied them for the past two years, and consider them superior for all railroad purposes.

Yours truly,

OSGOOD BRADLEY, Car Builder, Worcester.
T. & C. WASSON, do. Springfield.
DEAN, PACKARD & MILLS, do. do.
DAVENPORT & BRIDGES, do. Cambridgeport.

Fall River, February 2, 1880.

In answer to yours of the 20th ult. I would say that this company has for some 10 or 12 months past been using "Ray's India-rubber Springs." We have applied them to both passenger and freight cars with uniform success. They have invariably preserved their elasticity and consistency through all the extremes of weather; and we are now applying them whenever the steel spring fails. I am well satisfied that they are particularly adapted for railroad purposes.

Very respectfully yours,

GEO. HAVEN,
Supt. Fall River Railroad.

Office of the Boston and Lowell Railroad, }
Boston, March 8, 1880. }

EDWARD CRANE, Esq.,

Agent New England Car Co.

Dear Sir—In reply to your note, it gives me pleasure to state, that the results of using your India-rubber Springs on this road have been altogether favorable.

They retain, so far as has been observed on this road, their elasticity in any temperature; and are equally unaffected by the oil, with which they are necessarily brought into contact, and which I at first apprehended might have an injurious effect.

Though not in my opinion so easy as the "Air-spring" in its perfect state, they are much more easily kept in order, (indeed they require nothing in the way of repairs), and they last much longer, so that I am now substituting them for "air-springs," wherever these have been used under our cars.

Respectfully yours,

WALDO HIGGINSON,
Agent Boston and Lowell Railroad.

Office New Jersey Railroad Co., }
Jersey City, March 8, 1880. }

FOWLER M. RAY, Esq.,

Dear Sir: In answer to your enquiries respecting the operation of the Vulcanised Rubber Springs, purchased by our company from you some two years since, I reply that they are superior to any spring in use, (that I have either seen or heard of).

The improved form of your spring, consisting of a solid piece of vulcanised rubber with bands on the outside, is far superior to your first form, consisting of disks of rubber with metallic plates interposed.

The last named form was tried, if you recollect, at a much earlier period; and then was replaced by your last form.

I have no hesitation in saying that your springs have given entire satisfaction, and most cheerfully recommend them to railroad companies throughout the country for the following reasons:

- 1st. The cost is 30 per cent. less.
- 2d. Saving of weight on each car of 8 wheels from 700 to 800 lbs.
- 3d. Less care and attention is required, as they are not liable to get out of repair.
- 4th. A great saving is secured in the wear and tear of the cars and rails from their great elasticity.
- 5th. The freedom from noise.
- 6th. There is greater safety in case of accident, as they cannot be broken.
- 7th. The comfort of passengers is enhanced sufficiently to pay the expense, waiving all the other reasons that I have given.

Should this fail to satisfy any person enquiring, you are at liberty to refer to me, No. 150 Washington St., Jersey City.

Yours respectfully,

T. L. SMITH, Supt.

New York, March 11, 1880.

I have used the Patent India-rubber Spring purchased of Mr. Ray, upon the cars of the New York and New Haven Railroad, and have found them efficient and economical; and when applied to the axles and draw springs, believe them to be quite equal to any in use. I have found a combination of these springs with a steel spring under the transom beam a very satisfactory arrangement, and am now using this plan in all new cars.

Yours respectfully,

ROBERT SCHUYLER.

Passenger Car Linings.

THE Advertiser continues to make to order the Enamelled Car Linings which have been so highly approved the last three years, and are now exclusively used by all the Northern Railroads. No pains are spared to get out new styles, and adapt them to the tastes of every consumer.

Orders addressed to CHARLES STODDER, No. 75 Kilby street, Boston, will have prompt attention.
March 23, 1880. 2m

To Contractors.

SEALED PROPOSALS will be received at the Office of the Nashville and Chattanooga Railroad Company in Chattanooga until the 20th day of May next, for the graduation and masonry of the Chattanooga Division of said Road—embracing a distance of 27½ miles.

The graduation will be heavy for about 15 miles, (in crossing Raccoon Mountain, and passing around Lookout Mountain bluffs), the balance, average work. The masonry will consist chiefly of cut stone Piers for Tennessee River Bridge, (about 4,000 Perches), Piers for running Water Bridge, (about 2,000 Perches), and Pier for Lookout Creek Bridge, about 500 Perches.

Sealed proposals will also be received at the same time and place, for the graduation of 10 miles of the Eastern end of the Winchester Division—embracing some heavy work. Also the masonry of Elk River and Widow's Creek Bridges.

Plans and Profiles of the Work will be exhibited, specifications furnished, and all other desired information given, on application to Mr. James A. Corry, the Engineer in charge of the work, at the Company's Office in Chattanooga, from the 10th of May until the day of letting.

Before making bids the line should be thoroughly examined. The depths of the Cuts and Embankments can be ascertained from the centre stakes. The work to be commenced immediately after the letting. And that portion from Chattanooga to Lookout Bluffs to be completed by the 1st of December next. The other sections to be finished successively on toward the West end of the Division—the last by the 1st of October, 1881.

The most satisfactory testimonials will be required. The payments will be made in cash—reserving the usual 20 per cent. until the completion of the work.

By order of the Board.

JAMES H. GRANT, Chief Eng.
Nashville, Tenn., March 14, 1880.

TO CONTRACTORS.

NOTICE is hereby given, that from 30 to 60 miles of the Orange and Alexandria Railroad will be ready for examination between 1st and 15th of April next. The road passes through a very healthy and fertile region, and embraces an amount of work every way worthy of the attention of able and experienced men.

The Company prefers to let the whole work of construction in contracts of not less than 30 miles, and for that purpose parties wishing further information are invited to call at the office in Alexandria.

The bids will be made on a basis of payments in cash to the amount of 85 per cent, and the remaining 15 per cent in the stock of the company. They must be sent to this office not later than the 16th day of April next, to be submitted to the meeting of the Board of Directors to be held on the 18th of the same. By order of the Board.

T. C. ATKINSON,

Chief Engineer.

For the information of parties at a distance, it is well to state that the Orange and Alexandria Railroad is about 90 miles long, and extends from Alexandria through Fairfax, Prince William, Fauquier, Culpeper and Orange counties to Gordonsville, a point on the completed portion of the Virginia Central Railroad, formerly called the Louisa railroad.

An inspection of the map will show that its connections promise to make it as valuable a thoroughfare as any in the Union.

To Contractors.

THE Election of Directors of the Queenston Suspension Bridge Company having taken place, the Company are now prepared to receive Plans for the Bridge and Tenders for its erection. All communications to be directed, GILBERT McMICKEN, Queenston, Canada W.

Railroad Iron.

3,000 TONS C. L. MAKE 63½ lbs. per yard, now landing and to arrive.

Also contracts made for future delivery of above superior make English Iron.

300 Tons Banks Best Iron, Round, Square and Flat.

200 " English Bar " " " "

10 " 9-16 Square Iron for Railroad Spikes.

For sale in lots to suit purchasers by

DAVID W. WETMORE.

New York, March 26, 1880. 3m

Pennsylvania Railroad.

PROPOSALS will be received at Blairsville, Indiana county, until the 18th of April next, for grading the Western Division of the Pennsylvania Railroad.

The work to be contracted for, embraces three short Tunnels, a number of Stone Bridges and Culverts, and some very heavy excavations and embankments.

For further information apply to EDWARD MILLER, Esq., Associate Engineer, at Blairsville.

J. EDGAR THOMSON, Chief Eng.
Engineers' Department, Pennsylvania R.R., }
Philadelphia, March 23, 1880. }

To Miners and Mining Companies.

THE undersigned would respectfully call the attention of those persons engaged in mineral operations on Lake Superior to the following list of articles which will be sold on accommodating terms, viz:

- 600 bbls. Corn fed No. 1 Mess Pork.
- 500 " Stall fed Mess Beef.
- 25,000 lbs. " Sugar cured canvaseed" Hams.
- 2,200 " Dried Beef.
- 60,000 " "Kiln dried" Corn Meal,
- 500 bush. White "Field" Beans.
- 300 " Canada" Peas.
- 500 " Dried Apples.
- 100 bbls. and half bbls. "cucumber" Pickles.
- 50 " Sour Krout.
- 30 bush. Onions.
- 1,000 Beefs' Tongues Smoked and in Pickle.
- 10,000 lbs. "Mould" Candles.
- 10,000 " "Hard" Soap.

Also, a full and large supply of all articles that may be required by Mining Companies and those connected with them.

C. A. TROWBRIDGE,

127 Jefferson Avenue, Detroit, Michigan.

Gas Fixtures.

FIXTURES for Burning Gas for Lighting Public Buildings, Private Dwellings, Stores and Factories, manufactured by the subscriber in great variety. Orders by Mail, or left at the Factory on Causeway street, will be promptly attended to.

HENRY N. HOOPER & CO.

Boston, March 23, 1880. 6m13

Pacific Railroad. Philadelphia Convention.

On the first proximo, the great convention to promote the construction of a railroad to the Pacific will be held in Philadelphia, by adjournment of the convention held in St. Louis in October last.

We look upon the convention as likely to give a more definite and organized form to the public opinion which favors this work, than either of its predecessors held at St. Louis or Memphis. To be sure, we have but little information not known at the time these conventions were held; but until the question shall have been settled by actual survey, each section of the country interested in the road will assume the superiority of its favorite route; and this very uncertainty, may serve the useful purpose of concentrating public opinion upon the route which, abstractly shall meet the convenience of the greatest number of people. Should surveys therefore, leave the question of superiority of route nearly balanced, nothing will remain to be done, but to enact the will of the majority already expressed.

The object of meeting at Philadelphia, was to a certain extent sectional. That city is soon to be connected with St. Louis, by a line of railroad so remarkable for its directness, as to render it a shorter route from St. Louis both to New York and Baltimore than by the roads which these latter cities are building for the purpose of forming similar connections. Philadelphia regards herself as the appropriate eastern terminus, of the Pacific railway. Her interests and those of St. Louis are believed to be identical, and the interests of these two important cities are sustained by the united and potent influence of the various companies which are busily engaged in constructing what they believe to be the first great link in the chain of the Pacific railroad, from the Atlantic to the Mississippi. We may therefore expect at Philadelphia, an emphatic declaration in favor of making St. Louis one of the points in this great work.

It is certainly remarkable, that the lines of railway by which the four great Atlantic cities, Boston, New York, Philadelphia, and Baltimore, rivals of each other, are seeking to connect themselves with St. Louis, all make a common point in Western Ohio, and from thence pursue an identical route to St. Louis. Philadelphia therefore has no greater interest in the St. Louis route, as it is termed, of the Pacific railroad, than has Boston, New York, or Baltimore. The position of Philadelphia gives her the advantage of the shortest route. Indeed it is probable that this route will be the shortest by which merchants from either of the other cities, named, can reach the Mississippi, in preference to the routes from their respective cities.

Philadelphia and those engaged in the construction of the great central railroad, from that city, to St. Louis, have made the most of this fact, and have created an impression that she peculiarly was interested in the St. Louis route, while in fact she is no more so than her neighbors: all stand on the same footing in this respect.

It is for the interest of all the eastern States, lying north of Virginia, that the road to the Pacific should not run south of St. Louis, while this is the extreme southern limit of convenience to this section. It is also equally true, that the same section has a similar interest in a route further north. Should such a route, eventually, be found superior to the one by St. Louis, all the routes from the different parts of this section, making as we said before, a common point in Ohio, are interested

in the same route west of this point. The interests of Philadelphia are, therefore, the interests of the whole north and east, and the voice of this convention, will be the voice of this section when it shall be called upon to act.

Where may be, eventually, the main trunk line of the Pacific railroad, through the fertile portion of the Mississippi valley until, it reaches the section where the natural features of the country will allow but one route is not a question which we are now called upon to consider. The valley of the Mississippi is to be covered with a net work of railways, and amore northern route than St. Louis, crossing the Mississippi and Missouri rivers, at points where they can be bridged without injury to their navigation may in the end be adopted. This can be done at Rock Island on the Mississippi, and Council Bluff on the Missouri. We must expect that commerce will seek for itself, the most direct and easy channel of communication, with the same certainty that water follows the lowest depression.

But in the building of railroads the settlement of the country will to a certain extent override the mere question of superiority of route, as inhabitants along the proposed line, may be regarded as an almost essential condition of its construction.

In the state of Missouri only, is the country found to be inhabited to any great distance, west of the Mississippi river; neither is there any other city but St. Louis on the Mississippi above New Orleans, that can render any efficient aid to the building of a railroad west of that river; and while the people in the east are using every effort to reach the Mississippi, those of Missouri are co-operating in their efforts, and by the time the former reach that river, they will, in all probability, find a road already completed to take and carry them 400 miles farther on their way. Practically, therefore, St. Louis is for the present in the route for the Pacific railroad, as far as the north are concerned. On this point it may, with the knowledge we now possess, and in the present condition of the country in reference to its settlement act with entire unanimity.

But it must be borne in mind, that the question of route must be settled by another tribunal than a convention, and as accurate understanding of the topographical features of the country, which divides the Pacific from the Mississippi, is of the highest importance, and must precede all action, we would urge upon the convention the adoption of the most effective measures within their power, to effect this object at the earliest possible moment.

CALIFORNIA.

Hon. Thomas Butler King has presented his report upon the mineral wealth of California to the President. As soon as we can obtain a copy of it we shall give it to our readers.

Gas.

Manufacturers as well as gas companies, will find a good opportunity of supplying themselves with gas fixtures of various kinds by referring to the advertisement of H. N. Hooper & Co. in another column.

Railroad Lettings.

Contractors are invited to examine the advertisement of lettings in another column.

Back Volumes of the RAILROAD JOURNAL

From its commencement can be had on application to this office.

Nashville and Chattanooga Railroad.

ERROR CORRECTED.

In an abstract of the report of the Nashville and Chattanooga railroad of the 9th instant, the subscription of the Georgia Railroad and Banking Co. was accidentally omitted in the table showing the amount of means provided for the above road.— This subscription of \$250,000, should be added to the table we gave, making the whole aggregate \$2,556,750. It was the Georgia Central railroad that declined to make the subscription expected from it, instead of the Georgia railroad as there stated.

New York Railroads.

We give this week the statistical tables of the returns of the railroads of this State of the past year's operations. They are carefully copied from the report of the State Engineer. They are very imperfect in many respects, and the following roads, viz: the Buffalo and Black Rock, Lockport and Niagara Falls, New York and Harlem, and New York and New Haven made no report whatever. No reason is assigned for this omission, nor is it stated that any steps will be taken to compel the delinquents to furnish the required statement of their affairs. We shall have occasion to refer to the report in a further number.

Explosion of the "Boston."

We alluded in a recent number of our paper to the explosion of the locomotive Boston on the Saratoga and Schenectady Railroad. Below we give the results of the investigation in relation to the causes of this disaster, which seems to be attributable to the same cause which it is believed has produced so many similar explosions of late—the want of sufficient water in the boiler.

STATEMENT.

The report of the explosion of the locomotive engine Boston's boiler, having reached the Schenectady locomotive Works, Monday 11th inst., at 2 o'clock, P. M., Messrs. E. S. Norris, A. Thompson, E. Caldwell and myself, set out for an examination of the engine.

Proceeding to the spot where the explosion had taken place, we found the engine upset on the foot of the embankment, the dome turned towards the track. The waist or cylindrical part of the boiler, was found to be completely blown out, whilst the whole fire-box, dome and furnace, to all appearances, have received no injury whatever. The frames, braces, connecting rods, in short, all the parts connecting the front part with the back part of the engine, are torn asunder, and all the tubes, as well as the steam-pipe, are torn out of the front tube-sheet, which under the violent strain assumed a concave shape, and was partly rent from the waist of the boiler to which it had been riveted. The first sheet, next to the throat of the fire-box, is ripped open and bent back, so as to enter the furnace from below the grate-bars, the upper part has been completely torn from the seam, leaving a small band forming the lap behind. Thirteen copper tubes have been turned over near the furnace-flue-sheet, to which they are still fast, in such a manner, that they cover the left side of the fire-box.

All these facts show that the seat of the explosion was in the waist of the boiler. An examination of the fragments conclusively proved this to be the case. The parts of the waist to which the check-valves are attached, is severed in two halves. One of these, with the left hand check and a boiler-brace, still fast to it, was found about 10 yards back of the engine, at a small distance from and on the left side of the track, the other was thrown to the right side and fell down a precipice forming the bank of the river on that spot.

An examination of the first fragment elicited the following facts.

1st. The rupture had taken place in a line abutting nearly through the centre of the boiler, and being slightly inclined to the horizontal line.

2nd. The line of rupture was irregular, partly following the seams of the boiler, and partly ripping the boiler plate.

3rd. The fragment C, which was the one nearest to the embankment, had assumed the shape represented in the diagram at C'.

4th. Both extremities of that sheet *dd'* show distinctly the dull, bluish-gray color of iron having been nearly red-hot, the inside being quite free from sediment.

5th. The brass check still fastened to the end *d* by its color, presents the appearance of polished brass after exposure to a temperature of fluid lead, or as it is called a black heat.

6th. The ends of the stud-bolts by which the check is fastened to the boiler, show on the inside the appearance of having been exposed to nearly a red heat, the sediment with which such bolts are invariably found to be covered, has partly peeled off, and shows the gray color of iron which has been heated.

The above facts irresistibly lead to the conclusion that the water at the time of the explosion was below the centre of the boiler, (which exactly coincides with the centre of the checks,) in consequence of which, the parts situated above the centre must have been overheated. The injection of the first jet of cold water under such circumstances must have caused instantaneous explosion, so quick indeed, that the explosive effect could only act on the vicinity of the checks, which clearly accounts for the fire-box not having been injured at all.

Mr. Blackburn superintendent of motive power on the Utica and Schenectady railroad, who arrived at the spot shortly after ourselves, and also undertook a very careful examination, was led to the same conclusion. Indeed the nature of the evidence furnished by the inspection of that one fragment, was such that it could hardly fail to bring conviction as to the cause of the accident to the mind of any intelligent and reflecting observer.

The dusk of the evening not permitting a more minute examination of the furnace, I returned the following morning to the spot. By this time the fragments spoken of above had been removed from the premises. The other piece with the opposite check-valve attached to it, still occupied its position on the bank of the river, and showed, as I am informed by Mr. Blackburn and others, who had examined it, less indication of heat than the one examined previously, inasmuch as only one bolt presented a blue color without sediment, the other bolts still being enveloped in sediment. The check presented also a paler color.

I then proceeded to examine the furnace-flue-sheet which along the upper rows of tubes presented the gray appearances of heated iron, the sediment having to a great extent peeled off, bringing the clean surface of the iron into view. The upper tubes especially those that had been turned over, showed an appearance strikingly different from the lower ones, inasmuch as they were entirely free from mud and sediment, and exhibited a perfectly clean surface. Mr. Blackburn remarks particularly, that the parts of the tubes that were found lying on the snow, or appeared to have come in contact with moisture, presented the appearance of copper heated till nearly red, and then being plunged in water. Mr. Case, who has been engaged for years in making and repairing tubes, pronounced the upper tubes of this boiler to have been overheated, though not enough to anneal the metal.

As an additional fact, going far to prove the overheated state of the boiler at the time of the explosion, it may be mentioned in this place, that fragments of the casing—easily identified as such—have come to hand, which were almost completely turned into charcoal. Now, it is a well known fact, that the jacket of a locomotive boiler under ordinary circumstances, will be slightly charred on the inside, so as to assume a dark brown color. In the present instance, the outside of the wood showed the appearance which might have been expected on the inside, whilst the inside was completely black and partly burnt off.

I shall content myself with having given in the above a truthful record of circumstances as they came to my cognizance, mostly through my own observations, and partly by comparing notes with other reliable observers, especially Mr. Blackburn, to whom great credit is due for his most careful, di-

ligent and unprejudiced investigation of the circumstances attending the lamentable catastrophe, and I shall only add, that in considering all facts enumerated above, I can only come to the conclusion, that the primary cause of the accident was a want of water in the boiler.

HENRY BACMEISTER.

Schenectady, March 13, 1850.

I concur in the above statements in every particular, and also pronounce it as my opinion, that the throwing of cold water on the heated surfaces of the metal, which heat was produced by a low state of the water, was the cause of the explosion.

VINCENT BLACKBURN.

It is my opinion as above stated, that the upper tubes of the boiler of engine "Boston," were overheated, though not enough to anneal the metal.

LEVY CASE,

I fully concur in the statement of Mr. Bacmeister, and his opinions.

ALFRED THOMPSON.

We the undersigned having seen and examined the wreck of the engine "Boston," do agree with Mr. Bacmeister's statement, and fully concur in his opinions.

E. CALDWELL,

THOMAS CONLON,

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In connection with this subject (Iron Railroad Structures) we take occasion to call attention again to Mr. Dugan's valuable and expensive publication, exhibiting drawings, with full descriptions of the various stone, iron and wooden bridges, viaducts, tunnels, culverts, etc., of all the Railroads in the United States. Mr. Dugan is an accomplished Architect and Civil Engineer, who came from Ireland to this country to exercise his profession; but finding railroad construction here, in many respects, different from that he had been accustomed to in Europe, he applied himself to the study of our system; and the fruits of his researches and investigations embodied in this work, are well calculated to meet the exigencies of engineers, and to assist draughtsmen, bridge builders, mechanics and students. The work will be supplied to subscribers only, in 12 parts, at 75 cents each.—(N. Y. Journal of Commerce, Feb. 14, 1850.)

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We have been using your India-rubber Car Springs for nearly two years—and we take pleasure in saying that in our opinion the rubber has to a certain extent already, and may eventually entirely supersede all other Springs for Railroad Car purposes. We now use it entirely for Draw Springs and Bumpers, considering it better and lighter than steel.

During our two years' experience in the use of it, we have not known any to lose their elasticity, or fail in any way; and we cheerfully recommend the rubber for railroad car springs. Very respectfully,
EATON, GILBERT & CO.

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In answer to your enquiry about India-rubber Springs, I have to say that we have used them to a considerable extent on both freight and passenger cars, and also on several of our tenders; and I am very well satisfied that they answer all the purposes for which they are intended. I believe the India-rubber will soon supersede all other springs for cars and tenders.

Yours truly,
S. M. FELTON,
Supt. Fitchburg Railroad.

Office of the New Jersey Railroad Co.,
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This is to certify that we have had Mr. F. M. Ray's India-rubber Springs in constant use under our cars, and as Bumper Springs for upwards of two years, and they have in every way given perfect satisfaction.

The present form of spring we deem far superior to the form of Disk, having used both forms, although we have none of those made in Disks at present in use.

We take pleasure in recommending these springs to all railroad companies.

J. P. JACKSON, Vice Pres.
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Supt. Office N.Y. & H. R.R.,
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This is to certify that the present form of Mr. F. M. Ray's India-rubber Car Spring I consider far superior to the form of Disk, having used both forms.

I take pleasure in recommending these springs to all railroad companies.
DAVID H. BAKER,
Foreman of Car Shop of N.J. R.R. & Trans. Co.

Harlem R.R. Depot,
New York, March 7, 1850.

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The great expense incurred in building wharves to
facilitate business, it is hoped, will entitle the Proprietors
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January, 1850.

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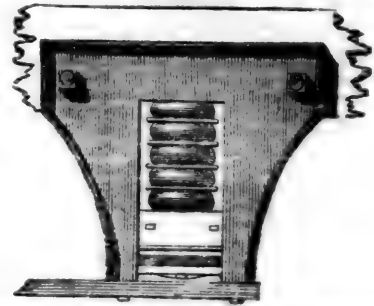
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A. W. CRAVEN, Secretary, etc.
New York, February 22, 1850.

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Albany, August 18, 1849.

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References given if required.

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ENGINEERS.

Bancks, C. W.,
Civil Engineer, Vicksburg, Miss.

Berrien, John M.,
Michigan Central Railroad, Marshall, Mich.

Buckland, George,
Troy and Greenbush Railroad.

Clement, Wm. H.,
Little Miami Railroad, Cincinnati, Ohio.

Cozzens, W. H.,
Engineer and Surveyor, St. Louis, Mo.

Davidson, M. O.,
Eckhart Mines, Alleghany Co., Maryland.

Fisk, Charles B.,
Cumberland and Ohio Canal, Washington, D. C.

Felton, S. M.,
Fitchburg Railroad, Boston, Mass.

Floyd-Jones, Charles,
South Oyster Bay, L. I.

Gzowski, Mr.,
St. Lawrence & Atlantic Railroad, Montreal, Canada.

Gilbert, Wm. B.,
Rutland and Burlington Railroad, Rutland, Vt.

Grant, James H.,
Nashville and Chattanooga R. R., Nashville, Tenn.

Harry, P.,
Binghamton, New York.

Holcomb, F. P.,
Southwestern Railroad, Macon, Ga.

Johnson, Edwin F.,
New York and Boston Railroad, Middletown Ct.

Latrobe, B. H.,
Baltimore and Ohio Railroad, Baltimore, Md.

Miller, J. F.,
Worcester and Nashua Railroad, Worcester, Mass.

Morris, Elwood,
Schuylkill Navigation, Schuylkill Haven, Pa.

Morton, A. C.,
Atlantic and St. Lawrence Railroad, Portland, Me.

McRae, John,
South Carolina Railroad, Charleston, S. C.

Nott, Samuel,
Lawrence and Manchester Railroad, Boston,
Prichard, M. B.,
East Tennessee and Georgia R. R., Cleveland, Tenn.

Roebbing, John A.,
Trenton, N. J.

Roberts, Solomon W.,
Ohio and Pennsylvania Railroad, Pittsburgh, Pa.

Sanford, C. O.,
South Side Railroad, Virginia.

Schlatter, Charles L.,
Northern Railroad (Ogdensburg), Malone, N. Y.

Sours, Peter,
Rahway, New Jersey.

Stark, George.,
Bost., Con. and Mont. R. R., Meredith Bridge, N. H.

Steele, J. Dutton,
Pottstown, Pa.

Trimble, Isaac R.,
Philad., Wil. & Baltimore Railroad, Wilmington, Del.

Tinkham, A. W.,
United States Fort, Bucksport, Me.

Thomson, J. Edgar.,
Pennsylvania (Central) Railroad, Philadelphia.

Whipple, S.,
Civil Engineer and Bridge Builder, Utica, N. Y.

Williams, E. P.,
Auburn and Schenectady Railroad, Auburn, N. Y.

Williams, Charles H.,
Milwaukee, Wisconsin.

Wormeley, Preble,
Central Ohio Railroad, Zanesville, Ohio.

HOTELS.

JONES' HOTEL,
NO. 152 CHESTNUT STREET,
PHILADELPHIA.
BRIDGES & WEST, Proprietors.

DUNLAP'S HOTEL,
On the European Plan,
NO. 135 FULTON STREET,
Between Broadway and Nassau St.,
NEW YORK.

BUSINESS CARDS.

Nathan Caswell,
METAL BROKER, 69 WALL ST., N. Y.
For the Purchase and Sale of Railroad Iron (new and old,) Boiler Plates, Pig and Bar Iron, Lead, Tin, Copper, Spelter, etc. Refers to
Messrs. Boorman, Johnston, & Co., New York.
" Grinnell, Minturn & Co., "
" Barston, Pope & Co., "
" Earps & Brink, Philadelphia.
" E. Pratt & Brother, Baltimore.
John Barstow, Esq., Providence.
Lewis Bullard, Esq., Boston.
February 9, 1850. 6m*

VanRensselaer Stevens,
Sup't Transportation Providence and Worcester R.R., Providence, R.I. Has had 13 years' experience in Operating Railroads. Will go South or West if applied to.

J. & Riley Carr,
Manufacturers of Cast, Shear, German and Blister
STEEL,
Of all Descriptions, Warranted Good.
BAILEY-LANE WORKS, SHEFFIELD.

R. S. DENTON, Agent,
NO. 20 CLIFF ST., NEW YORK.

STEEL AND FILES.
R. S. Denton,
20 CLIFF STREET, NEW YORK,
AGENT FOR

J. & Riley Carr's
BAILEY-LANE WORKS, SHEFFIELD,
Manufacturers of Cast, Shear, German and Blister
STEEL
Of all descriptions. Warranted Good
FILES.

Manufacturers of Machinists' Warranted Best Cast Steel Files, expressly for working upon Iron and Steel, made very heavy for recutting.
A full Stock of Steel and Files at all times on hand. 6m4

Cumberland, (Md.) Coals for Steaming, etc.
ORDERS RECEIVED FOR AND FILLED
by J. COWLES, 37 Wall St., N. Y.

George O. Robertson,
BROKER IN SCOTCH AND
AMERICAN PIG IRON;
Bar Iron, Lead, Spelter, Tin, Copper, etc.,
No. 4 Liberty Place, MAIDEN LANE,
(Near Broadway,) NEW YORK

Manufacture of Patent Wire ROPE AND CABLES,
For Inclined Planes, Suspension Bridges, Standing Rigger, Mines, Cranes, Derrick, Tillers, &c., by
JOHN A. ROEBLING, Civil Engineer,
TRENTON, N. J.

Samuel D. Willmott,
MERCHANT, AND MANUFACTURER OF
CAST STEEL WARRANTED SAWS,
IMPORTER OF THE
GENUINE WICKESLY GRINDSTONES
NO. 8 LIBERTY STREET,
NEW YORK.

Doremus & Harris,
ANALYTICAL & CONSULTING CHEMISTS,
179 BROADWAY, NEW YORK.
SCHOOL OF CHEMISTRY.

Dudley B. Fuller & Co.,
IRON COMMISSION MERCHANTS,
No. 139 GREENWICH STREET,
NEW YORK.

Manning & Lee,
GENERAL COMMISSION MERCHANTS,
NO. 51 EXCHANGE PLACE,
BALTIMORE.
Agents for Avalon Railroad Iron and Nail Works.
Maryland Mining Company's Cumberland Coal 'CED'
—'Potomac' and other good brands of Pig Iron.

**Railroad Car Manufacturer's
Furnishing Store.****F. S. & S. A. MARTINE,**

IMPORTERS AND MANUFACTURERS OF

**RAIL ROAD CAR &
CARRIAGE LININGS,**PLUSHES, CURTAIN MATERIALS, ETC.,
112 WILLIAM ST., NEAR JOHN.3-4 and 6-4 Damasks, Union and Worsteds; Mo-
reens, Rattinets, Cloths, Silk and Cotton Velvets,
English Bunting**S. W. Hill,**Mining Engineer and Surveyor, Eagle River,
Lake Superior.**Alfred W. Craven,**

[Chief Engineer Croton Aqueduct, New York.

Starks & Pruyn,MANUFACTURERS OF ALL KINDS OF
STEAM BOILERS,

52 and 54 Liberty, corner of Pruyn street

Nathan Starks, **ALBANY** Special Partner
Wm. F. Pruyn, R. H. Pruyn.
Iron Railing, Bank and Vault Doors, Iron Shutters
Bridge and Roof Bolts, Heavy Jobbing and Forging
of all kinds.

For particulars see Adv. in another column.

To Engineers and Surveyors.E. BROWN AND SON Mathematical inst. mak-
ers No. 27 Fulton Slip, New York, make and keep
for sale, Theodolites, Levelling inst., Levelling rods,
Surveyors Compasses, and Chains, Cases of Mathe-
matical drawing insts. various qualities, together with
a general assortment of Ivory Scales and small insts.
generally used by Engineers.**Samuel Kimber & Co.,****COMMISSION MERCHANTS**

WILLOW ST. WHARVES, PHILADELPHIA.

AGENTS for the sale of Charcoal and Anthracite
Pig Iron, Hammered Railroad Car and Locomo-
tive Axles, Force Pumps of the most approved con-
struction for Railroad Water Stations and Hydraulic
Rams, etc., etc.

July, 27, 1849.

James Herron, Civil Engineer,[OF THE UNITED STATES NAVY YARD,
PENSACOLA, FLORIDA.,

PATENTEE OF THE

HERRON RAILWAY TRACK.Models of this Track, on the most improved plans,
may be seen at the Engineer's office of the New York
and Erie Railroad.**To Railroad Companies.****—WROUGHT IRON WHEELS—
SAFETY AND ECONOMY.****NORRIS' LOCOMOTIVE WORKS,
SCHENECTADY, NEW YORK,**Are Manufacturing Wrought Iron Driving, Truck,
Tender, and Car Wheels—made from the best Ameri-
can Iron. Address **E. S. NORRIS.**
May 16, 1849.**Machinery Warehouse.**S. C. HILLS, No. 43 Fulton street, New York, has
constantly for sale Steam Engines, Boilers, Lathes,
Chucks, Drills, Planers, Force and Suction Pumps;
Tenoning, Morticing and Boring Machines, Shingle
Machines, Bolt and Nut Machines, Belting, Oil, Iron
and Lead Pipe; Rubber, Percha and Leather Hose,
&c., &c.S. C. H.'s arrangements with several machine shops
are such that he can supply, at very short notice, large
quantities of machinery.
November 23, 1849.**Cruse & Burke,**Civil Engineers, Architects and Surveyors,
Office, New York State Institution of Civil Engineers,
STATE HALL, ALBANY, N. Y.Drawings, specifications and surveys accurately ex-
ecuted. Pupils instructed theoretically and practical-
ly at a moderate premium.
May 26, 1849.**Eaton, Gilbert & Co.,**Railroad Car, Coach and Omnibus Builders,
TROY, N. Y.**Hudson River Foundry,
THOMAS & COLLINS,**

130 Quay Street, Albany.

To Railroad & Navigation Cos.Mr. M. BUTT HEWSON, Civil Engineer, offers his
services to Companies about to carry out the surveys
or works of a line of Navigation or Railroad. He can
give satisfactory references in New York City as to his
professional qualifications; and will therefore merely
refer here to the fact of his having been engaged for
upwards of two years conducting important Public
Works for the British Government.Communications will find Mr. Hewson at the office
of the Railroad Journal, 54 Wall Street, New York.**Walter R. Johnson,**CIVIL AND MINING ENGINEER AND AT-
torney for Patents. Office and Laboratory, F. St.,
opposite the Patent office, Washington, D. C.**Cop Waste.**CLEAN COP WASTE, suitable for cleaning Rail-
road, Steamboat and Stationary Engines, con-
stantly on hand and for sale by**KENNEDY & GELSTON,**
54 Pine St., New York.
3m

October 27, 1849,

Ranstead, Dearborn & Co.,

MANUFACTURERS OF

LOCOMOTIVE CRANKS AND CAR AXLES,

ALSO

WROUGHT IRON SHAFTING,

And All Kinds of Hammered Shapes.

Forge at Commercial Point, Dorchester,
Office 25 Foster's Wharf, opposite No. 211 Broad St.**BOSTON.****IRON.****Iron.**Pig Iron, Anthracite and Charcoal; Boiler and Flue
Iron, Spring and Blistered Steel, Nail Rods, Best Re-
fined Bar Iron, Railroad Iron, Car Axles, Nails, Stove
Castings, Cast Iron Pipes of all sizes, Railway Chairs
of approved patterns for sale by**COLEMAN, KELTON & CAMPBELL,**
109 N. Water St., Philadelphia.**IRONDALE PIG METAL, MANUFACTURED**
and for sale by the Bloomsburg Railroad Iron Co.
DUDLEY FISHER, Treasurer.
75 N. Water St., Philadelphia.**Railroad Iron.****500** Tons, about, weighing 57 pounds per lineal
yard, for sale by
COLLINS, VOSE & CO.,
159 South St.
New York, November 17, 1849. 1m46**Railroad Iron.****1675** Tons, weighing about 61 lbs. per yard, 90
tons, weighing about 52 lbs. per yard, and
825 tons, weighing about 53½ lbs. per yard, of the lat-
est and most approved patterns of T rail, for sale by
BOORMAN, JOHNSTON & CO.,
119 Greenwich street.
New York, Feb. 25, 1850.N.B.—B. J. & Co are also prepared to take con-
tracts for English rails, delivered in any of the Atlan-
tic ports of the United States.**Railroad Iron.****THE UNDERSIGNED, HAVING** made arrange-
ments abroad, are prepared to contract for the deliv-
ery of Foreign rails, of approved brands upon the
most favorable terms.They will also make contracts for American rails,
made at their Trenton works, from Andover Iron, in
whole or in part, as may be agreed upon.They are prepared to furnish Telegraph, Spring and
Market Wire; Braziers and Wire Rods; Rivets and
Merchant Bars to order, all made exclusively from An-
dover Iron. The attention of parties who require iron
of the very best quality for special purposes, is respect-
fully invited.**COOPER & HEWITT,**
17 Burling Slip, New York.

February 15, 1850.

Glendon Refined Iron.Round Iron, Band Iron, Hoop Iron,
Square " Flat " Scroll "Axles, Locomotive Tyres,
Manufactured at the Glendon Mills, East Boston, for
sale by **GEORGE GARDNER & CO.,**
5 Liberty Square, Boston, Mass.

Sept. 15, 1849.

3m37

**PATENT HAMMERED RAILROAD, SHIP &
BOAT SPIKES.**—The Albany Iron Works
have always on hand, of their own manufacture, a
large assortment of Railroad, Ship and Boat Spikes
from 2 to 12 inches in length, and of any form of head.
From the excellence of the material always used in
their manufacture, and their very general use for rail-
roads and other purposes in this country, the manu-
facturers have no hesitation in warranting them fully
equal to the best spikes in market, both as to quality
and appearance. All orders addressed to the subscrib-
ers at the works will be promptly executed.**JOHN F. WINSLOW, Agent.**Albany Iron and Nail Works, Troy, N. Y.
The above Spikes will be had at factory prices, of
Erastus Corning & Co Albany; Meritt & Co., New
York; E. Pratt & Br 1st, Es. 2nd, Md**LAP—WELDED
WROUGHT IRON TUBES**

FOR

**TUBULAR BOILERS,
FROM 1 1-2 TO 8 INCHES DIAMETER.**These are the ONLY Tubes of the same quality
and manufacture as those so extensively used in
England, Scotland, France and Germany, for Lo-
comotive, Marine and other Steam Engine Boilers**THOMAS PROSSER,**

Patentee.

28 Platt street, New York.

Railroad Iron.**THE UNDERSIGNED ARE PREPARED TO**
contract for the delivery of English Railroad Iron
of favorite brands, during the Spring. They also re-
ceive orders for the importation of Pig, Bar, Sheet, etc.
Iron.**THOMAS B. SANDS & CO.,**
22 South William street,
New York.

February 3, 1849.

Iron Store.**THE** Subscribers, having the selling agency of the
following named Rolling Mills, viz: Norristown,
Rough and Ready, Kensington, Triadelphia, Potts-
grove and Thorndale, can supply Railroad Companies,
Merchants and others, at the wholesale mill prices for
bars of all sizes, sheets cut to order as large as 58 in.
diameter; Railroad Iron, domestic and foreign; Loco-
motive tire welded to given size; Chairs and Spikes;
Iron for shafting, locomotive and general machinery
purposes; Cast, Shear, Blister and Spring Steel; Bol-
ter rivets; Copper; Pig iron, etc., etc.**MORRIS, JONES & CO.,**Iron Merchants,
Schuylkill 7th and Market Sts., Philadelphia.

August 16, 1849.

1y33

Railroad Iron.**THE MOUNT SAVAGE IRON WORKS, AL-**
legany county, Maryland, having recently pass-
ed into the hands of new proprietors, are now prepar-
ed, with increased facilities, to execute orders for any
of the various patterns of Railroad Iron. Communi-
cations addressed to either of the subscribers will have
prompt attention. **J. F. WINSLOW, President**
Troy, N. Y.**ERASTUS CORNING, Albany****WARREN DELANO, Jr., N. Y.****JOHN M. FORBES, Boston.****ENOCH PRATT, Baltimore, Md.**

November 6, 1848.

Railroad Iron.**THE SUBSCRIBERS ARE PREPARED TO**
take orders for Railroad Iron to be made at their
Phoenix Iron Works, situated on the Schuylkill Riv-
er, near this city, and at their Safe Harbor Iron Works,
situated in Lancaster County, on the Susquehanna
river; which two establishments are now turning out
upwards of 1800 tons of finished rails per month.Companies desirous of contracting will be promptly
supplied with rails of any required pattern, and of the
very best quality.**REEVES, BUCK & CO.,**

46 North Water St., Philadelphia.

March 15, 1849.

Monument Foundry.

A. & W. DENMEAD & SON,
Corner of North and Monument Sts.,—Baltimore,
HAVING THEIR

IRON FOUNDRY AND MACHINE SHOP

In complete operation, are prepared to execute faithfully and promptly, orders for Locomotive or Stationary Steam Engines, Woolen, Cotton, Flour, Rice, Sugar Grist, or Saw Mills, Slide, Hand or Chuck Lathes, Machinery for cutting all kinds of Gearing, Hydraulic, Tobacco and other Presses, Car and Locomotive patent Ring Wheels, warranted, Bridge and Mill Castings of every description, Gas and Water Pipes of all sizes, warranted, Railroad Wheels with best faggotted axle, furnished and fitted up for use, complete.

Being provided with Heavy Lathes for Boring and Turning Screws, Cylinders, etc., we can furnish them of any pitch, length or pattern.

Old Machinery Renewed or Repaired—and Estimates for Work in any part of the United States furnished at short notice.

June 8, 1849.

Iron Wire.

REFINED IRON WIRE OF ALL KINDS,
Card, Reed, Cotton-flyer, Annealed, Broom, Buckle, and Spring Wire. Also all kinds of Round, Flat or Oval Wire, best adapted to various machine purposes, annealed and tempered, straightened and cut any length, manufactured and sold by

ICHABOD WASHBURN.

Worcester, Mass., May 25, 1849.

American and Foreign Iron.**FOR SALE,**

300 Tons A 1, Iron Dale Foundry Iron.
100 " 1, " " "
100 " 2, " " "
100 " " Forge " "
400 " Wilkesbarre " "
100 " "Roaring Run" Foundry Iron.
300 " Fort " "
50 " Catocin " "
250 " Chikiswalungo " "
50 " "Columbia" "chilling" iron, a very superior article for car wheels.
75 " "Columbia" refined boiler blooms.
30 " 1 x 1 Slit iron.
50 " Best Penna. boiler iron.
50 " "Puddled" "
50 " Bagnall & Sons refined bar iron.
50 " Common bar iron.

Locomotive and other boiler iron furnished to order.

GOODHUE & CO.,

New York. 64 South street

American Pig, Bloom and Boiler Iron.

HENRY THOMPSON & SON,
No 57 South Gay St., Baltimore, Md.,
Offer for sale. Hot Blast Charcoal Pig Iron made at the Catocin (Maryland), and Taylor (Virginia), Furnaces; Cold Blast Charcoal Pig Iron from the Cloverdale and Catawba, Va., Furnaces, suitable for Wheels or Machinery requiring extra strength; also Boiler and Fine Iron from the mills of Edge & Hilles in Delaware, and best quality Boiler Blooms made from Cold Blast Pig Iron at the Shavandoah Works, Va. The productions of the above establishments can always be had at the lowest market price for approved paper. American Pig Iron of other brands, and Rolled and Hammered Bar Iron furnished at lowest prices. Agents for Watson's Perth Amboy Fire Bricks, and Rich & Cos. New York Salamander Iron Chests.
Baltimore, June 14, 1849. 6 mos

Wheel, Forge and Foundry Iron.

LOCUST GROVE Wheel Iron of great strength and superior chilling property.
Balt. Charcoal Forge Iron, from Patuxent, Curtis Creek and Gunpowder furnaces.
Elkridge Foundry Iron, of superior strength and softness. Anthracite and Charcoal Iron from Pennsylvania and Virginia. Gas and Water Pipes, Lamp Posts from Elkridge furnace.

LEMMON & GLENN,
62 Buchanan's Wharf, Baltimore.

Iron.

THE SUBSCRIBERS having resumed the agency of the New-Jersey Iron Company, are prepared to execute orders for the different kinds and sizes of Iron usually made at the works of the company, and offer for sale on advantageous terms.—

150 tons No. 1 Boonton Foundry Pig Iron.
100 " No. 2 do. do. do.
300 " Nos. 2 & 3 Forge do. do.
100 " No. 2 Glendon do. do.
140 " Nos. 2 & 3 Lehigh Crane do. do.
100 " No. 1 Pompton Charcoal do.
100 " New-Jersey Blooms
50 " New-Jersey Faggoting Iron, for shafts
Best Bars, 1 to 4 inch by 1 to 1 inch thick.
Do do Rounds and Squares, 1 to 3 inch.
Rounds and Squares, 3-16 to 1 inch.
Half Rounds, 1 to 1 in. Ovals & Half Ovals 1 to 1 1/2 in.
Bands, 1 1/2 to 4 inch. Hoops, 1 to 2 inch.
Trunk Hoops, 1 to 1 1/2 in. Horse Shoes & Nut Iron.
Nail Plates, Railroad Spikes.

DUDLEY B. FULLER & Co., 139 Greenwich-st. and 85 Broad-st.

WILLIAM JESSOP & SONS' CELEBRATED CAST-STEEL.

The subscribers have on hand, and are constantly receiving from their manufactory.

PARK WORKS, SHEFFIELD,

Double Refined Cast Steel—square, flat and octagon.
Best warranted Cast Steel—square, flat and octagon.
Best double and single Shear Steel—warranted.
Machinery Steel—round.

Best and 2d gy. Sheet Steel—for saws and other purposes.

German Steel—flat and square, "W. I. & S." "Eagle" and "Goat" stamps.

Genuine "Sykes," L. Blister Steel.
Best English Blister Steel, etc., etc., etc.

All of which are offered for sale on the most favorable terms by **WM. JESSOP & SONS,**
91 John street, New York.

Also by their Agents—

Curtis & Hand, 47 Commerce street, Philadelphia.
Alex'r Fullerton & Co., 119 Milk street, Boston.
Stickney & Beatty, South Charles street, Baltimore.
May 6, 1849.

Ogden & Martin's ROSENDALE CEMENT.

WE are prepared to enter into arrangements for supplying our Cement for public works or other purposes. We warrant the cement equal in every respect to any manufactured in this country. It attains a great degree of hardness, sets immediately under water, and is a superior article for masonry coming in contact with water, or requiring great strength.

For sale in tight barrels, well papered, at their office by **OGDEN & MARTIN, 104 Wall st.**
February 16, 1850. 1y*

The above cement is used in most of the fortifications building by government.

JOHNSON, CAMMELL & Co's Celebrated Cast Steel,

AND
ENGINEERING AND MACHINE FILES,
which for quality and adaptation to mechanical uses, have been proved superior to any in the United States. Every description of square, octagon, flat and round cast steel, sheet, shovel and railway spring steel, best double and single shear steel, German steel, flat and square, goat stamps, etc. Saw and file steel, and steel to order for any purposes, manufactured at their Cyclops Steel Works Sheffield.

JOHNSON, CAMMELL & CO.,
100 William St., New York.

November 23 1849.

Railroad Iron.

1,500 Tons weighing 53 lbs. per lineal yard.
500 " " 57 " "
500 " " 56 " "
500 " " 60 & 61 lbs. "
Also 2 1/2 x 7 flat rails. All the above being of approved patterns. For sale by

DAVIS, BROOKS, & CO.,
68 Broad street.

N.B.—Rails imported on commission, or at a fixed price.

CUT NAILS OF BEST QUALITY, BAR IRON
(including Flat Rails) manufactured and for sale by **FISHER, MORGAN & CO.,**
75 N. Water St., Philadelphia.

American Cast Steel.

THE ADIRONDAC STEEL MANUFACTURING CO. is now producing, from American iron, at their works at Jersey City, N.J., Cast Steel of extraordinary quality, and is prepared to supply orders for the same at prices below that of the imported article of like quality. Consumers will find it to their interest to give this a trial. Orders for all sizes of hammered cast steel, directed as above, will meet with prompt attention.
May 23, 1849.

To Steam Engine Builders.

THE Undersigned offer for sale, at less than half its cost, the following new machinery, calculated for an engine of 62 inches cylinder and 10 feet stroke, viz.

- 2 Wrought Iron Cranks, 60 inches from centre to centre.
- 1 Do. do. Connecting Rod Strap.
- 2 Do. do. Crank Pins.
- 1 Eccentric Strap.
- 1 Diagonal Link with Brasses.
- 1 Cast Iron Lever Beam (forked).

The above machinery was made at the West Point Foundry for the U. S. Steamer Missouri, without regard to expense, is all finished complete for putting together, and has never been used. Drawings of the cranks can be seen on application to

HENRY THOMPSON & SON,
No. 57 South Gay St., Baltimore, Md.

Sept. 12, 1849.

Railroad Instruments.

THEODOLITES, TRANSIT COMPASSES,
and Levels, with Fraunhoffer's Munich Glasses, Surveyor's Compasses, Chains, Drawing Instruments, Barometers, etc., all of the best quality and workmanship, for sale at unusually low prices, by

E. & G. W. BLUNT,
No. 179 Water St., cor. Burling Slip.

New York, May 19, 1849.

Ballard's Improved JACK-SCREW.

PATENTED.

THE ADVANTAGES OF THIS
Screw for Stone Quarries, Railroads, Steam Boiler Builders, and for other purposes are superior to any other similar machine.

The improvement consists in being able to use either end of the screw, as occasion requires.

It is capable of raising the heaviest Locomotive with ease, being portable, strong and powerful, and not likely to get out of order.

Many Railroad Companies and Boiler Makers have them in use—by whom they are highly recommended.

JACK SCREWS,
of various sizes, power and price, constantly on hand at the manufactory.

No. 7 Eldridge Street,
near Division Street.
New York, Jan. 19, 1850.

**To Railroad Companies and Contractors.**

FOR SALE.—Two Locomotive Engines and Tenders, at present in use on the Beaver Meadow Railroad, being too light for their coal trains, but well calculated for either gravel or light passenger trains.

They weigh, in running order, about 8 tons each—having one pair of driving wheels 4 feet diameter, 4 truck wheels 30 inches diameter, with cylinders 10 in. diameter, and 18 inches stroke of piston. Tenders on 4 wheels. Address **JAMES ROWLAND,**

Pres't. Beaver Meadow Railroad & Coal Co.,
Philadelphia.

or, **L. CHAMBERLAIN, Sec'y,**
at Beaver Meadow, Pa.

May 19, 1849. 20ff

SPRING STEEL FOR LOCOMOTIVES, TENDERS AND CARS.—The subscriber is engaged in manufacturing spring steel from 1 1/2 to 6 inches in width, and of any thickness required: large quantities are yearly furnished for railroad purposes, and wherever used its quality has been approved of. The establishment being large, can execute orders with great promptitude, at reasonable prices, and the quality warranted. Address **J. F. WINSLOW, Agent,**
Albany Iron and Nail Works.

To Railroad Companies.

FOR SALE—A Second-hand Locomotive Engine and Tender, of about 10 tons weight, in good order and warranted to perform well. Any company wanting a cheap engine for a passenger or light burden train, will rarely meet with an opportunity so favorable as the present. The engine and tender are in perfect running order, and will be tested to the satisfaction of any one wishing to purchase. Price \$1,500.

Address J. B. MOORHEAD,
Frazer P.O., Chester county, Pa.

P.S.—The Engine can be seen by calling on H. Osmond & Co., Car-builders, Broad st., Philadelphia.
September 6, 1849.

India-rubber for Railroad Cos.

RUBBER SPRINGS—Bearing and Buffer—Fuller's Patent—Hose from 1 to 12 inches diameter. Suction Hose. Steam Packing—from 1-16 to 2 in. thick. Rubber and Gutta Percha Bands. These articles are all warranted to give satisfaction, made under Tyer & Helm's patent, issued January, 1849.—No lead used in the composition. Will stand much higher heat than that called "Goodyear's," and is in all respects better than any in use. Proprietors of railroads do not be overcharged by pretenders.

HORACE H. DAY,
Warehouse 23 Courtlandt street.
New York, May 21, 1849.

Fire Brick.

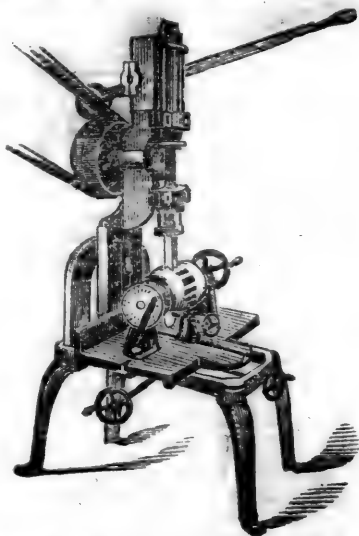
THE Subscribers have constantly on hand Rafford's Stourbridge, Oak Farms Stourbridge, Lister, Wortley, Red and White Welsh Fire Bricks, common and fancy shapes. Also,

ROOFING SLATES,

from the best Welch quarries, and of all sizes. Also, COAL, of all kinds—Liverpool Orrell and Cannel, Scotch, New Castle, Pictou, Sidney, Cumberland, Virginia, and all kinds of Anthracite coals. Also,

Pig Iron, Salt, etc., for sale at the lowest market price. Apply to

SAMUEL THOMPSON & NEPHEW,
275 Pearl and 43 Gold Sts., New York.
November, 23, 1849.

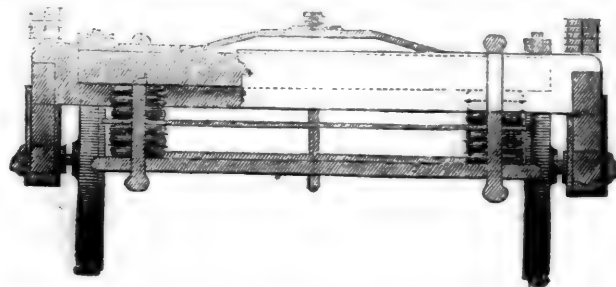
Capt. Alfred Swingle's PATENT BORING & MORTISING MACHINE.

The above Machine was invented by A. SWINGLE, of Texas, in 1846, and Letters Patent were taken out in July, 1848. As a labor saving Machine it stands unrivalled even in these days of improvements. Its uses are innumerable; it may be successfully applied to Doors, Sashes, Carriages, Wheel-Hubs, and in fact to all kinds of work where the Auger and Chisel can be brought to bear.

The only limit to the speed of the working of this machine is the heating of the tools used. It will perform at least the labor of twelve men, and in vastly better manner, and can be worked equally well by steam power or by hand. It has been used and has given universal satisfaction.

For further information apply to H. B. TEBBETTS, 40 Wall St., New York, to whom all orders are to be addressed.

New York, December 15, 1849.

FULLER'S PATENT INDIA RUBBER CAR SPRINGS.

RAILROAD COMPANIES are cautioned, before purchasing Springs, to examine the actual patents and judge for themselves.

Persons, under the Title of the New England Car Company, seeking fraudulently to invade Fuller's rights, have put forth so many statements for the purpose of misleading the public, that an enumeration of some facts is absolutely necessary, for the purpose of putting persons interested upon their guard.

Fuller's patent is for the application of Discs of India-rubber with Metal Plates, for forming Springs for Railway Cars and Carriages—either one disc and two plates, or ten discs and plates, or any other number, are equally covered by the patent. Fuller is not bound to the use of short discs—he may use long discs and plates.

Ray's patent is simply and wholly the forming of air tight rubber cylinders, with hoops or bands round the outside, and the combination of elasticity of India rubber, with the elasticity of atmospheric air confined in the cylinder, and in no part of his patent is he authorized to use the form of spring which he is now fraudulently supplying to Railroad Companies. Such springs are direct and positive infringements of the very letter of Fuller's patent.

Fuller's patent is dated October, 1845, Ray's patent, August, 1848.

The spring patented by Ray never has been put in operation, and never can be made useful for Railroad cars.

A mere experiment, even if made, it is well known does not prove an invention; and it is ridiculous for such parties to hope to mislead the Presidents and Superintendents of Railroad companies, by claiming the invention because Ray alleges he made an experiment—which Fuller had made before him—had actually brought into working order, and obtained a patent for—and this too before Mr. Ray states he made his experiment—and that experiment not claimed to have been applied to a car or carriage.

Besides, the invention could not have been developed until India rubber, properly Vulcanised, could be made of a sufficient thickness. In the United States the art of vulcanising rubber by steam heat, (by which

means only can a body of rubber having any considerable thickness be vulcanised,) was not introduced until after the grant by the American government of the patent for springs to Fuller—whereas the process of vulcanising rubber by steam heat was invented in England about three years previously, and was used by Fuller there. This fact refutes entirely the claim of invention put forth by Mr. Ray, and proves the impossibility of his pretensions being true.

Fuller was the first and only inventor of the spring. A Mr. Dorr, whose connection with Mr. Goodyear is well known in this country, applied in England to Mr. Fuller, after he had published and patented his invention, and introduced another party for the purpose of obtaining the agency for the United States. They were furnished with a complete set of drawings and models, and with instructions to make arrangements for the supply of material of American manufacture—from that hour to the present not a single communication has been received from them. Some of these identical models have been traced into the hands of parties now seeking to invade Fuller's rights, and who have exhibited them as specimens of their own invention.

After this, the conveyance was made by Goodyear to certain parties here for the use for railroad springs of what he calls his Metallic rubber. Comment is unnecessary.

There are 5 or 6 different processes for the manufacture of vulcanised rubber, patented by as many different parties, some here, some in England, either of which would probably make good springs.

A large and powerful company has been organized under Fuller's patent, the particulars of which shall be given very shortly.

An action has been commenced against three railroad companies for infringement; and all other parties will assuredly be prosecuted if they continue farther to infringe upon Fuller's patent.

W. C. FULLER,

The only persons authorised to supply the Springs are G. M. KNEVITT, 38 Broadway, N. York, General Agent for the U. S.; and JAS. LEE & Co., 18 India Wharf, Boston. JOHN THORNLEY, Chestnut st., Philad.

Patent India Rubber Steam Packing.

THIS article, made by the subscriber, who alone is authorised to make it, is warranted to stand as high a degree of heat as any that has been or can be made by any person—and is the article which has made the reputation of India Rubber Steam Packing and the demand therefor. A large assortment of all thickneses requisite for any description of engines, steam pipes, valves, etc., constantly on hand and for sale by the manufacturer and patentee, who will give every information regarding its properties, mode of use, etc. at the warehouse.

JOHN GREACHEN, JR.,
98 Broadway, opposite Trinity Church.
New York, October, 1849.

Ibbotson, Brothers & Co's CELEBRATED CAST STEEL

AND Best Cast Steel Royal Improved Files, well known as better adapted for Engineers' and Machinists' purposes than any now in use in the United States.

Every description of Square, Octagon, Flat and Round Cast Steel, Sheet, Shovel and Railway Spring Steel, etc., and Steel to order for any purposes—manufactured at their works in Sheffield—and universally known by the old stamp "Globe."

HENRY J. IBBOTSON, Agent,
218 Pearl st., New York.

February 25, 1850.

FAIRBANKS' RAILROAD SCALES.—THE subscribers are prepared to construct at short notice, Railroad and Depot Scales, of any desired length and capacity. Their long experience as manufacturers—their improvements in the construction of the various modifications, having reference to strength, durability, retention of adjustment, accuracy of weight and dispatch in weighing—and the long and severe tests to which their scales have been subjected—combine to ensure for these scales the universal confidence of the public.

No other scales are so extensively used upon railroads, either in the United States or Great Britain;—and the managers refer with confidence to the following in the United States.

Eastern Railroad.	Boston & Maine Railroad.
Providence Railroad.	Providence and Wor. Road.
Western Railroad.	Concord Railroad.
Old Colony Railroad.	Fitchburg Railroad.
Schenectady Railroad.	Syracuse and Utica Road.
Balt. and Ohio Railroad.	Baltimore and Susq. Road.
Phila. & Reading Road.	Schuykill Valley Road.
Central (Ga.) Railroad.	Macon and Western Road.
New York and Erie Railroad.	

And other principal Railroads in the Western, Middle and Southern States.

E. & F. FAIRBANKS & CO.

St. Johnsbury, Vt.

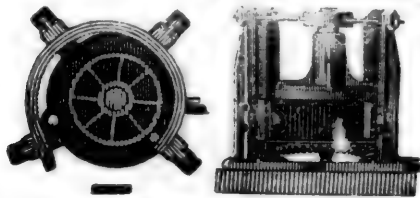
Agents, } FAIRBANKS & Co., 81 Water St., N. York.

April 22, 1849. } A. B. NORRIS, 196 Market St. Philadelphia.

1y*17

MACHINERY.

Henry Burden's Patent Revolving Shingling Machine.



THE Subscriber having recently purchased the right of this machine for the United States, now offers to make transfers of the right to run said machine, or sell to those who may be desirous to purchase the right for one or more of the States.

This machine is now in successful operation in ten or twelve iron works in and about the vicinity of Pittsburgh, also at Phoenixville and Reading, Pa., Covington Iron Works, Md., Troy Rolling Mills, and Troy Iron and Nail Factory, Troy, N. Y., where it has given universal satisfaction.

Its advantages over the ordinary Forge Hammer are numerous: considerable saving in first cost; saving in power; the entire saving of shingler's, or hammerman's wages, as no attendance whatever is necessary, it being entirely self-acting; saving in time from the quantity of work done, as one machine is capable of working the iron from sixty puddling furnaces; saving of waste, as nothing but the scoria is thrown off, and that most effectually; saving of staffs, as none are used or required. The time required to furnish a bloom being only about six seconds, the scoria has no time to set, consequently is got rid of much easier than when allowed to congeal as under the hammer. The iron being discharged from the machine so hot, rolls better and is much easier on the rollers and machinery. The bars roll sounder, and are much better finished. The subscriber feels confident that persons who will examine for themselves the machinery in operation, will find it possesses more advantages than have been enumerated. For further particulars address the subscriber at Troy, N. Y.

P. A. BURDEN.

Railroad Spikes and Wrought Iron Fastenings.

THE TROY IRON AND NAIL FACTORY, exclusive owner of all Henry Burden's Patented Machinery for making Spikes, have facilities for manufacturing large quantities upon short notice, and of a quality unsurpassed.

Wrought Iron Chairs, Clamps, Keys and Bolts for Railroad fastenings, also made to order. A full assortment of Ship and Boat Spikes always on hand.

All orders addressed to the Agent at the Factory will receive immediate attention.

P. A. BURDEN, Agent,
Troy Iron and Nail Factory, Troy, N. Y.

RAILROAD WHEELS.

CHILLED RAILROAD WHEELS.—THE UNDERSIGNED are now prepared to manufacture their Improved Corrugated Car Wheels, or Wheels with any form of spokes or discs, by a new process which prevents all strain on the metal, such as is produced in all other chilled wheels, by the manner of casting and cooling. By this new method of manufacture, the hubs of all kinds of wheels may be made whole—that is, without dividing them into sections—thus rendering the expense of banding unnecessary; and the wheels subjected to this process will be much stronger than those of the same size and weight, when made in the ordinary way.

A. WHITNEY & SON,
Willow St., below 13th,
Philadelphia, Pa.

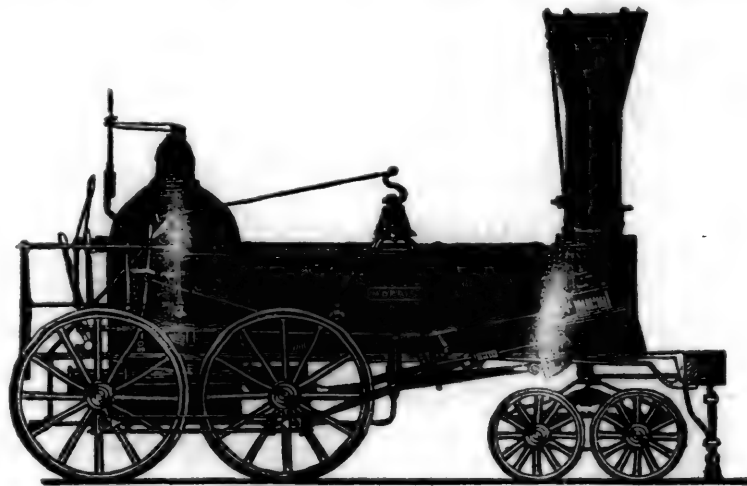
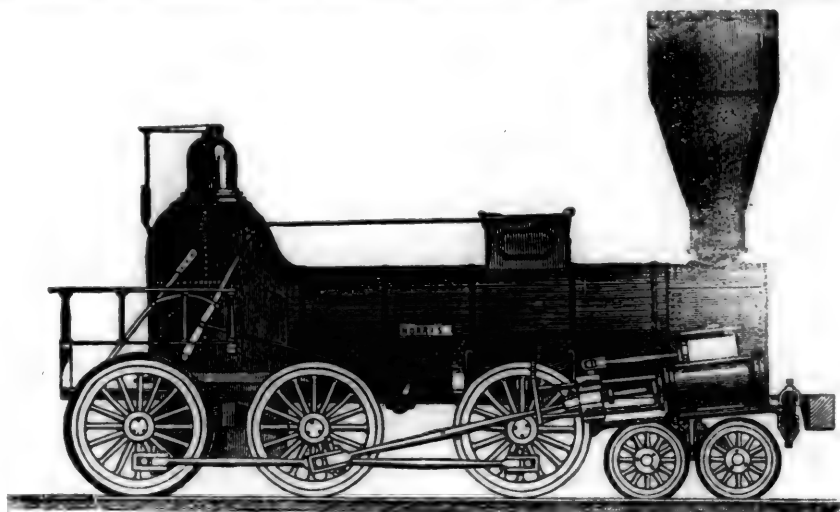
CHILLED RAILROAD WHEELS.—THE UNDERSIGNED, the Original Inventor of the Plate Wheel with solid hub, is prepared to execute all orders for the same, promptly and faithfully, and solicits a share of the patronage for those kind of wheels which are now so much preferred, and which he originally produced after a large expenditure of time and money.

A. TIERS,
Point Pleasant Foundry.

He also offers to furnish Rolling Mill Castings, and other Mill Gearing, with promptness, having, he believes, the largest stock of such patterns to be found in the country.

A. T.

Kensington, Philadelphia Co.,
March 12, 1848.

NORRIS' LOCOMOTIVE WORKS.
BUSHHILL, SCHUYLKILL SIXTH-ST., PHILADELPHIA.

THE UNDERSIGNED Manufacture to order Locomotive Steam Engines of any plan or size. Their shops being enlarged, and their arrangements considerably extended to facilitate the speedy execution of work in this branch, they can offer to Railway Companies unusual advantages for prompt delivery of Machinery of superior workmanship and finish.

Connected with the Locomotive business, they are also prepared to furnish, at short notice, Chilled Wheels for Cars of superior quality.

Wrought Iron Tyres made of any required size—the exact diameter of the Wheel Centre, being given, the Tyres are made to fit on same without the necessity of turning out inside.

Iron and Brass castings, Axles, etc., fitted up complete with Trucks or otherwise.

NORRIS, BROTHERS

COLUMBUS, OHIO,

Railroad Car Manufactory.
RIDGWAYS & KIMBALL,

HAVE established at this central point, the manufacture of Passenger, Freight, Gravel and Hand Cars for Railroads, and assure all Western Railroad Companies that it will be their constant aim to procure the best materials and workmen, and to turn out the best kind of work at fair prices. Specimens may be seen on the Columbus and Xenia Railroad. The patronage of Railroad Companies is respectfully solicited.

178

LAWRENCE'S ROSENDALE HYDRAULIC Cement. This Cement is warranted equal to any manufactured in this country, and has been pronounced superior to Francis' "Roman." Its value for Aqueducts, Locks, Bridges, Floors, and all Masonry exposed to dampness, is well known, as it sets immediately under water, and increases in solidity for years.

For sale in lots to suit purchasers, in tight papered barrels, by
JOHN W. LAWRENCE,
142 Front-street, New York.

Orders for the above will be received and promptly attended to at this office. 32 ly.

PATENT MACHINE MADE HORSE-SHOES.

The Troy Iron and Nail Factory have always on hand a general assortment of Horse Shoes, made from Refined American Iron.

Four sizes being made, it will be well for those ordering to remember that the size of the shoe increases as the numbers—No. 1 being the smallest.

P. A. BURDEN, Agent,
Troy Iron and Nail Factory, Troy, N. Y.

To Inventors and Patentees.

OWEN G. WARREN, ARCHITECT, Has had many years' experience as Agent for obtaining Patents, both in this country and Europe, and will transact such business promptly and reasonably. Persons at a distance can have their business done by correspondence—without the necessity of visiting this city or Washington. Office No. 94 Merchants Exchange, Wall st., corner of Hanover st., up stairs. 173

AMERICAN RAILROAD JOURNAL.

STEAM NAVIGATION, COMMERCE, MINING, MANUFACTURES.

HENRY V. POOR, Editor.

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SATURDAY, APRIL 6, 1850

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ASSISTANT EDITORS,

J. T. HODGE, *For Mining and Metallurgy.*

GEN. CHAS. T. JAMES, *For Manufactures and the Mechanic Arts.*

M. BUTT HEWSON, C. E., *For Civil Engineering.*

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American Railroad Journal.

PUBLISHED BY J. H. SCHULTZ & Co., 136 NASSAU ST.

Saturday, April 6, 1850.

Northwestern Lead Mines.

Continued from page 194.

The following are the estimates of the expense of working one of these furnaces. Being made at different furnaces they will be seen to differ somewhat.

Expenses of Blast Furnaces Two Shifts.

Two smelters, \$1 54 per day.....	\$3 08
Two back hands, 78 cents.....	1 56
Two assistants, 69 cents.....	1 38
Fuel, 20 bushels charcoal, 12½; wood, 50.....	3 00
Board six hands, 35 cts.....	2 10
Ore 6,000 lbs. at \$15.....	90 00
Hauling ore.....	3 00
Hauling 4,200 lbs. lead to Galena.....	12 60

Daily expense.....\$116 72
Transportation to Galena need not be more than 20 cents per hundred pounds, making a difference in this item of \$4 20. The charcoal may be made for less on one's own land, and one-fifth of the price of the ore might be saved if the whole were mined on land belonging to the furnace—four-fifths, if the discovery too was the proprietor's.

Product, 4200 lbs., worth \$126. Slag worth —.

Expenses of Blast Furnaces, One Shift.

Ore smelter.....	\$1 15
Two assistants, 57½ cents.....	1 15
Fuel, 8 bushels charcoal, 12½; wood 50.....	1 50
Board three hands, 50 cents.....	1 50
Ore, 3,000 lbs. \$15.....	45 00
Hauling ore nine miles to furnace, 75 cents. 2 25	
Hauling lead to Galena, 2,100 lbs.....	4 20

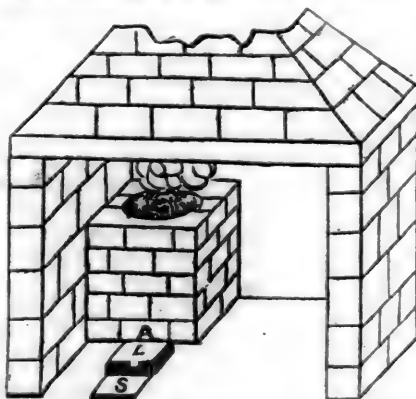
Daily expense.....\$56 75

One-fifth ore rent saves \$9. Hauling the ore and board may be much less. The wages as estimated are lower than workmen could generally be employed for.

Product 2100 lbs., worth \$63. Slag worth —.

The amount of lead obtained from the ore is usually estimated at seventy per cent. Ten to twelve per cent. then is lost, and remains in the slag.—The walls and front of the furnace are always covered with a thick incrustation of oxide and sulphur of lead, and much more goes off in the white smoke, all of which might be saved were it an object.

In estimating the importance of this business, it must be taken into account, that it is not always an easy matter to keep one furnace supplied with ore, much more several. And again, that the returns for the sale of the lead are at the price it brings at Galena with the merchants there, who make their profits by shipping it to the eastern market.



The slag furnace, represented in the accompanying figure, is often connected with a blast furnace or a reverberatory, particularly when the smelter can obtain any of the old slag from the now abandoned ash furnaces to mix with what he makes.—

At some furnaces the slag is beaten under stamps

and washed through a series of pits, but generally it is merely broken by hammer into small lumps and then thrown into the furnace. The size of this is about four feet in height, four feet in depth and five feet across the front. The twer is introduced from behind, opposite the hole for the exit of the lead and slag. In the figure, L is a vessel to catch the lead. The slag flows over into the hole S, thro' which runs a current of water. The fuel used is charcoal.

The principle of the slag furnace differs from that of the blast furnace, in which the ore is exposed to the greatest oxidizing action to be obtained—the object being thoroughly to melt the slag and keep it in a fluid state, until the metal separates, and both run out together through the hole in front. The blast furnishes a supply of oxygen for the complete reduction of the ore that had before escaped its action, and maintains the intensity of the fire. The lead sinks into the first vessel, the slag floats over it into the next, through which runs a stream of water. Here it is cooled, and then ladled out and thrown away. It is generally believed that this glassy slag is nearly free of metal. To determine this, I digested some of it in nitric acid, separated the silica, and threw down the lead as a sulphuret by hydro-sulphuric acid; after converting this into sulphate of lead and weighing I found it still contained 24.72 per cent. of oxide of lead, equal to 22.9 per cent. of lead.

The amount of lead produced by one of these furnaces varies of course with the quality of the slag. At O'Neill's slag furnace on the Peccatolica, near Mineral Point, where the charge consists of the rich reverberatory furnace slag, and that from the old ash furnaces, twenty-seven pigs of lead are frequently obtained at one shift or day's work, twenty-five are always considered a fair amount for one day. The hands employed are a smelter, back hand and assistant.

According to Dr. Owen the number of furnaces in the lead region in 1839 was fifty. Four of them were in Iowa, and about as many in Illinois.—About sixteen of the whole were reverberatory furnaces, the rest principally blast. These fifty furnaces were estimated to make 30,000,000 pounds of lead annually, which is 600,000 pounds of each on the average. But six of them are estimated to make 1,000,000 pounds each, four from 1,260,000 to 1,502,200 pounds each, while seven make only from 400,000 to 194,610 pounds each, the smallest quan-

tity made by any one furnace. The number of miners working at intervals, say half of each year, is estimated on the same authority at three thousand. By dividing the amount produced among those employed according to the established proportions, the business as a whole appears to be a paying business, but not a lucrative one. There are chances however in this, as in all other operations, by which miners and smelters have done much better than the average. There is a great want of capital in the country, by means of which the business might be conducted more independently of immediate returns, and ore or even lead be bought when the prices are the lowest. The possession of timber lands would be no small saving in a district where wood is worth \$5 per cord, as it is in the winter at Mineral Point, and where charcoal sells at the extravagant price of twelve and a half cents a bushel.

From the St. Louis Price Current and Commercial Record, published on the 5th January of the present year, we gather the following data as to the extent and progress of the business since the year 1840:

"Table of the Entire Product of the Upper Mines."

Year.	Pigs.	Year.	Pigs.
1841....	463,104	1846....	732,403
1842....	473,699	1847....	772,656
1843....	584,113	1848....	681,969
1844....	624,601	1849....	625,562
1845....	778,469		

It will be perceived that there has been considerable falling off in the production for the past two years; the total of this year being about equal to that of 1844.

We have no data by which to judge of the product of the lower mines; but from the best information we can get, the falling off has been equal to that of the upper mines. It is evident that the consumption of the article is rapidly on the increase. The following is the amount used by our city manufacturers:

	Pigs.
Kennett, Simonds & Co., shot manufacturers	70,000
Henry T. Blow, white lead	20,000
T. H. Warren & Co., "	9,000
J. W. Roberts, sheet and lead pipe	20,000

119,000"

The production of the lower mines (those of Missouri) is not given in this estimate. This may be from ten to fifteen per cent. of that of the upper mines. The diminution in the yield of the mines since the year 1847 we think is to be ascribed to causes entirely independent of their real productiveness. They are worked by a class of people of roaming habits, whom the rumor of a new discovery leads to abandon their temporary "diggings" for a chance elsewhere. They invest little capital in permanent operations, and are as free to go at any time to Lake Superior or California, as to the discoveries in an adjoining county. It is these new mineral regions that have drawn off large numbers of the lead miners—some of the most enterprising we know among them, and we look to a still greater falling off in the production of lead for this reason for years to come.

The deficiency in the supply of what is required for the country is so great, that, as we find by the Price Current above quoted, 300,000 pigs of foreign lead have been imported the past year. This importation is still largely going on, and is not likely soon to cease any more than that of iron; for though our mines of both these metals are as rich and extensive as any in the world, our vast country continues to open too many new resources to admit of

their being wrought to the extent necessary to supply our demand, in competition with the low prices of labor in foreign countries.

The transportation of lead from the furnaces of Wisconsin is usually conducted by teamsters from Illinois. They take loads from Mineral Point to Galena—forty miles—at twenty cents per hundred pounds, using oxen, which for six months in the year pick up their own feed in the road, when the drivers stop during the day, or at night to camp.

The most eastern mines—those on Sugar creek, are within one hundred miles of Racine, the nearest port on Lake Michigan. The produce of these must eventually find an outlet in this direction instead of going down the Mississippi river. At the usual rate of expenses of hauling lead by teams, two tons may be carried 100 miles for \$21 75, and what back loads could be procured would go to diminish this amount. But the railroad now rapidly progressing from Chicago towards Galena will soon change the course of transportation of the greater part of the lead from the upper mines, and it will be delivered in our northern cities by the lakes, instead of making the circuit of nearly the whole of the United States. At present the cost of transportation from Galena to St. Louis is from 15 to 30 cents per hundred pounds; the price varying with the stage of the water. From Galena direct to New York, the usual estimate for the transportation of 100 pounds is \$1 25; but this may be considerably reduced and much time saved by the owner going on himself with a large amount of lead.

From ports on Lake Michigan lead could be shipped to New York for something less than \$12 per ton—probably for fifty cents per 100 pounds. Allowing five dollars per ton transportation and charges to Chicago, there would be a large balance in favor of the lake route with due allowance for extra charges.

It must certainly hereafter be regarded as an extraordinary fact, that for so many years lead should have been transported such immense distances for the supply of localities so near its place of production. The great extent of populous country bordering the lakes, even the eastern part of Wisconsin itself, has received this article and the shot and white lead manufactured from it, after it was carried down the Mississippi river to New Orleans, and thence shipped to New York or Boston, and again transported back towards its original locality. It is yet we believe rather unusual for a load of lead to be sent across to the ports on Lake Michigan.

Few portions of the United States seem to offer greater inducements for settlers—to be better favored by nature than the northern lead region. Its mines afford a fair compensation to a considerable population, and insure to the farmer a home market for his produce; while he finds the lands highly productive and easy of cultivation. The seductive pursuit of mining, however, which here, as in the gold region, can be prosecuted temporarily and with the investment of little capital, too often leads to the neglect of agriculture; and less favorable results are attained in each pursuit, than if the division between them were more strictly observed.—As along the coast farmers are too often attracted to engage in fishing and navigation, and neglect their farms, so at the western mines, they are perhaps too much inclined to dig deeper into their lands than the point where they would find their greatest richness. In salubrity of climate no region exceeds that of the more elevated portions of the lead district. Fevers and agues contracted along the banks

of the larger streams, are soon cured in the pure air around Mineral Point. The winters, it is true, are rather severe, and the north winds blow cold over the open prairies. Still the climate is healthy, and conducive to industry. H.

[Foreign Correspondence of the Railroad Journal.]

H. V. POOR—Dear Sir—After sundry journeyings by land and sea, I find myself transported from the capital of France to Naples. This city I have been accustomed from my early years to regard as most nearly realizing my ideas of perfection, for all that is beautiful in scenery or delightful in climate. Its claims to the former have not been so much overrated. The well cultivated environs clad with the vine and the olive tree, bespotted with cottages, and bounded by picturesque mountains; its bay, opening into the broad sea, and crowned with islands, are beautiful indeed! But its climate disappointed me. The more distant mountains, and even Vesuvius, are covered with snow. The fountains are mounted with ice. Chill, damp winds blow in from the sea, often accompanied by rain and hail. Houses have only the most primitive conveniences for fire, with which it is impossible to expel the cold and humidity; to this add the half frozen aspect of the almost naked beggars that throng the streets, and crying with cold and hunger, huddle together like cattle in every sheltered and sunny place; and you have a picture of winter in Naples, somewhat different from that you have been used to associate with it if fancy, yet nevertheless, a true one. All this a person in good health can of course endure without serious inconvenience; but the invalid who leaves the comforts of a home in New York or in New England to pass the winter here, must be disappointed in the advantages for health, unless indeed he arrive in season to surround himself with those conveniences and comforts which Americans, better than any other people, know how to provide and appreciate.

Naples has been, in times past, distinguished by the appellation "noble" on account of the great number of nobility and gentry who resided here; but there is not much in her present condition to merit that title.

Neither her public nor private buildings are distinguished for architectural beauty or imposing appearance. The streets are for the most part narrow, dark and without sidewalks. The nobility though numerous, can boast little more than the name. They have an honest saying here, that the nobility sport a fine carriage with servants in liveries abroad, and live on macaroni at home. In point of population it ranks next to Paris and London among European cities having 400,000 inhabitants; but of these about 40,000 are beggars and lazzeroni, as many more are ecclesiastics, all of whom, together with the nobility, are a burden upon the producing classes, and of course render their condition anything but prosperous. This last fact, which applies as well to the whole kingdom as to Naples, is of itself a sufficient explanation of the recent political disturbances which had well nigh unseated the present king, Ferdinand II. from his throne. The movement commenced at Palermo, in Sicily, a short time before the Revolution of February, 1848, at Paris, and was at first quite successful. Messina next followed the example, and a general spirit of revolt throughout the kingdom soon manifested itself—some good fighting was done particularly at Messina, but for want of competent leaders, the people would have been entirely successful. It is all over now however. The king

and priests have triumphed, to exercise a more despotism than ever; but they are in the midst of volcanic elements, which like Vesuvius, even now manifest evidence of agitation, and are liable at any moment to be thrown into a state of commotion. That they are aware of this, is evident, from the fact that they have thrown some 6,000 persons into prison, (may say 10,000) since the people laid down their arms, and a quarantine has been established at every port in the kingdom to prevent the return of the thousands who were obliged to fly their country to escape imprisonment or death. The quarantine it is true was ordered under pretence of the cholera at Marseilles; but it was so well understood to be political rather than sanatory and was so vexatious withal, that strong intimations from the English and French governments caused its removal the first of the present month, much to the gratification of travellers who wished to visit the country, and of the people who are suffering excessively from the embarrassments of trade caused by the disturbances, and continued by this annoying embargo upon commerce.

The kingdom of the two Sicilies embraces the islands of that name, and enough of the boot of Italy to make altogether 31,616 Italian miles, or about 41,000 English miles, and is divided into 22 provinces, each of which is under the jurisdiction of a governor called Intendent, and these are again sub-divided into 76 districts, for each of which is a sub-intendent. These officers are the tools of the king, whose power before the late outbreak had scarcely any effectual check, and now may be said to have none save that occasioned by fears of the wail of an over oppressed people.

Three-tenths of the land is estimated to be occupied by towns, roads, water and mountains. Six-tenths are in tillage and orchards, and one-tenth in wood. Situated between 36° and 38½° N. latitude, this kingdom has an excellent climate for agricultural productions, and a soil almost unsurpassed for fertility, yet the oppressed condition of the people, and the narrow, monopolising policy of the government has so destroyed all energy and enterprise that it is miserably poor compared with what it might be. Grain could be raised in almost any quantity, yet hardly enough is raised for home consumption. Its waters abound in fish, yet large quantities are annually imported from Newfoundland. Wool is easily produced, yet little is exported. There are extensive iron mines in the Calabrian forest, but being worked by government monopoly, an annual product of only 22,900 cwts. is afforded. Nearly all the wrought iron used in the kingdom comes from abroad. Olive oil is the most valuable article of foreign trade produced in the kingdom, amounting to 36,000 tons of \$3,729,000 in value. Small quantities of manufactured silks are sent from Palermo, Calabria and Santa Leuse. Naples manufactures large quantities of gloves of an inferior quality. Sicily exports wine, sulphur, sumac, fruits and spirits. The sulphur mines are, I am told, entirely under the control of English manufacturers, to whom they are indispensable. An English merchant informed me that but for the supply of sulphur from these mines, the dyeing, printing and tanning establishments of Manchester could not be operated a single month, and that an adequate supply can be obtained from no other source. He spoke in no measured terms of indignation against his government because they did not improve the opportunity of the rebellion, to get possession of the islands and make sure of the mines; the possession of which by any other pow-

erful nation would enable it at once to ruin their manufactures. If these islands are really so important a key as represented, we may expect England will yet have some warm contests with her enemies about them.

The ports of Naples, Catania, Messina and Palermo in this kingdom are quite well situated for commerce, yet so far as I have been able to get statistics the same want of thrift and enterprise is indicated in this branch of business as in agriculture and manufactures. The statistics are very incomplete and unsatisfactory. Serristori estimates the exports of the mainland provinces in 1771 at \$6,216,000, and the imports at \$5,606,720, and in 1837 the exports of the same provinces are set down at only \$7,740,963, and the imports at \$10,501,256, being a very slight increase in a period of 66 years. The returns for the ports of Sicily are equally irregular and unreliable, yet from 1838 to 1839 I notice a very large increase of trade with the United States, and I regret that I have found no later returns upon this point. The exports from Sicily in 1838 were in value \$4,716,119, of which the United States received \$623,717. The imports for the same year amounted to \$2,691,434, of which \$71,910 were furnished by the United States. In 1839, the exports amounted to \$5,996,188, of which the United States received \$1,748,120. The imports are stated at \$3,526,251, of which the United States furnished \$319,227. The value of imports furnished the latter year by the United States being more than quadruple those furnished in the former, while the total amount of imports the latter year are put down as actually less than in the year previous. There is a corresponding falling off in the amount of imports furnished by England for this year, which would seem to indicate that the United States had been a successful competitor with her for the Sicilian trade. I would like exceedingly to see the result in subsequent years, but am not able to find sufficient data.

The Neapolitan and Sicilian registers of 1830 give 6943 as the whole number of vessels in the kingdom. Of these 1,485 were small fishing boats, and a larger portion of the remainder very small trading coasters. In 1833 they show in all 7,600 vessels, but as there is no registry of tonnage upon the main land I take the average of those of Sicily, (18 tons each) which makes the total tonnage of the kingdom 136,800, about one-third that of the city of Liverpool.

These data are not so recent as I would like, yet there having been no advance in any thing since 1830, when the present king, this impersonation of dullness and obstinacy, came to the throne, they will give a tolerably accurate idea of the present amount of tonnage and commerce.

The whole extent of railroads in this kingdom is less than 50 miles. That from Naples to Nocera, passing over Herculaneum and near Pompeii is about 18 English miles in length—was built by a French company and completed in 1840. The rails are from England and the machinery from France. The road is quite good. Trains move from 12 to 15 miles the hour. There are four classes of carriages. In the third class servants, and indeed any body may ride who clothes his head and feet. The fourth class is for the hatless and shoeless passengers, having no seats, and much resembling our cattle cars. This class of passengers was quite as numerous as any. This road has a branch that deviates to the right after passing Portici, passes through two or three villages and then joins the main track. The other road extends from Na-

ples to Caserta and Capua, is of about the same length, being 20 miles, and of the same character as the other. One acquainted with railroads will see nothing in either worthy of imitation.

Such a thing as a telegraph is not to be found here, and would be of very little use if constructed; for the chief point in the policy of this astute court is to prevent as much as possible all communication among the people, and to lay every restriction upon the dissemination of intelligence.

The population of the kingdom is 7,600,000 or there about, of which about 125,000 are ecclesiastics.

Railroads between the Hudson River and Buffalo.

The following resolutions were passed at a meeting of delegates from all the railroad companies between the Hudson river and Lake Erie on the central line of railway held at Albany, 6th March, 1850:

Resolved, That this line of railroad, being limited in the amount of freight which may be transported, by the state tolls which are required to be paid, cannot reduce the fare of passengers to the same rates that other lines are able to do, where tolls are not required.

Resolved, That there should be a difference in the fare between the express trains and those which are run at a lower rate of speed.

Resolved, That in order to meet the expectations of the public as far as practicable, having proper reference to the principles set forth in the foregoing resolutions, that the first class through fare on all other than the express trains, be fixed as near as may be at two and a half cents per mile for the whole distance between Buffalo and Albany.

Resolved, That the following trains be run during the ensuing season:

1st. Train leaving Albany at 7½ a.m. and Buffalo at 6½ a.m. running through in 12 hours, time to be distributed according to distance.

2d. Train leaving Albany and Buffalo at 9 a.m. and running through in 17 hours, time to be distributed according to distance.

3d. Train leaving Albany and Buffalo at 2 p.m. and running through in 24 hours, time to be distributed according to distance.

4th. Train leaving Albany and Buffalo at 7 p.m. and running through in 14 hours, time to be distributed according to distance.

RATES OF FARE.

On the 1st & 4th train express, \$9 75 Albany to Buffalo.

On the 2d trains, mail and accommodation \$8 00 do. do.

On the 3d trains, emigrant and 2d class, \$5 00 do. do.

Whereas it is indispensably necessary in order to make the day express trains perform uniformly, their trips in the time allowed—12 hours—and in order to preserve uniformity and perfect concert of action, without which it will be impossible to depend on each other for promptness on this line.

Resolved, That the day express train shall stop on the several roads, at the following and no other places, for watering, watering, and change of cars, namely: Schenectady, Fonda, Little Falls, Utica, Oneida, Syracuse, Auburn, Geneva, Canandaigua, Rochester, Batavia, and Attica.

Resolved, That in the event of the tolls being taken off from freight, transported on this line of railroad, between Buffalo and Albany, the charge for transportation will be reduced at least equal to the amount of the tolls, and the fare for first class passengers, on all except the express trains, in the judgment of this convention may be reduced to two cents per mile.

Resolved, That no other persons than those employed by the railroad companies, at the several stations, shall be allowed to take any charge of baggage or of the checks, except by the direction of the owner of such baggage.

Resolved, That a committee be appointed to mature a plan in regard to free passengers, and communicate the same to each company here represent-

ted, and solicit their action thereon, and an interchange of their conclusions in regard to the plan presented; and that the same committee prepare a circular on the subject of free passengers, and communicate the same to the various railroad companies in the Union. Messrs Wilkinson, Corning, Whiteley and How, were appointed this committee.

THOMAS Y. HOW, JR.
Secretary.

On the Construction of Roads.

Continued from page 194.

Friction.—The resistance of friction arises from the rubbing of the wheels against the surfaces with which they come in contact, and will always exist, however the surface may be improved. Its two extremes may be seen on a road of loose gravel, and on a railroad. It is greatly increased when the surface is covered with mud, or other loose material, into which the wheel may sink, and thus give a wider contact. The degree in which it is influenced by the surface, may be shown by rolling an ivory ball successively over a carpet, a fine cloth, a smooth floor, and a sheet of ice; the distances to which the same force will impel it over these surfaces increasing in the order in which they have been named.

The surface may be improved by the various methods of diminishing the friction, to be examined in chap. IV., such as "Macadamizing" the road or covering it with a layer of finely broken stones; paving with smooth stone blocks; covering with planks; or laying wheeltracks of stone, wood or iron.

The friction on all these surfaces is different, and can be determined only by experiment. The instrument used for measuring it is called a *Dynamometer*. It resembles in principle and general construction the "spring balances" in common use, in which the application of weight compresses a spiral spring, the shortening of which, as shown by a properly graduated scale, indicates the amount of weight applied. In the dynamometer the power takes the place of the weight of the spring balances, one end of the instrument being connected with the carriage, and the other with the horses, and the force which they exert to overcome the friction being shown by the index.

Sir John Macneil has greatly improved the instrument, by adapting to it a piston working in a cylinder full of oil, which lessens the vibrations of the index, and enables its indications to be read with more ease and precision. He has also added to it a contrivance for making the instrument itself record the degree of force exerted at each moment of motion. It likewise registers the distance passed over, and the rises and falls of the road.*

This valuable instrument affords a means of ascertaining the exact power required to draw a carriage over any line of road; it will thus enable one line of road to be compared with another, and their precise amount of difference in case of draught, to be determined; it will show the comparative value of the different methods of improving the surface; and it will enable a registry to be kept from year to year of the state of a road, showing where and how much it has improved or deteriorated, and therefore how judiciously, or the contrary, the funds expended on it have been applied.

The following are the results of experiments made with this instrument on various kinds of road.—The wagon employed weighed 21 cwt., and the resistance to draught was as follows:—

* On a gravel road, laid on earth—per 21 cwt.....	147 lbs. = 1.16
* On a broken-stone road, laid on earth per 21 cwt.....	65 = 1.36
* On a broken-stone road, on a paved foundation, per 21 cwt.,.....	46 = 1.51
* On a well made pavement, per 21 cwt.....	33 = 1.71
† On the best stone track-ways, per gross ton.....	12½ = 1.79
‡ On the best form of railroad per gross ton.....	8 = 1.286

* For a full description of this instrument, see *Parnell*, pp. 327-347.

* *Parnell*, pp. 43, 73.

† *Ibid.* p. 107.

‡ *Lecount*, p. 219.

From the above experiments we infer, in round numbers, taking the maximum load on a gravel road for the standard, that a horse can draw—

On the best broken-stone road 3 times as much.
On a well made pavement.... 4½ times as much.
On the best stone track-ways... 11 times as much.
On the best railways..... 18 times as much.

Poncelet gives the following relations of the friction to the pressure, for wheels with iron tires rolling on different surfaces:

On a road of sand and gravel..... 1-16
On a broken-stone road, in ordinary condition. 1-25
" " in perfect condition... 1-67
On a pavement in good order, at a walk..... 1-54
" " at a trot..... 1-42
On oak planks not dressed..... 1-98

The most complete series of experiments upon the friction of vehicles have been recently made by M. Morin. Some of the most important results are given below, in a tabular form. The fractions express the relation of the force of draught to the total load, vehicles included.

	Character of the vehicle.			
	Trucks of 2½ tons.	Diligences of 5 tons.	Carriages with seats hung on springs.	
New road, covered with gravel, five inches thick.....	1-12	1-9	1-8	1-8
Solid causeway of earth, covered with gravel 1½ inch thick.....	1-16	1-11	1-10	1-10
Causeway of earth in very good condition.....	1-41	1-29	1-26	1-26
Oaken platform.....	1-70	1-46	1-41	1-42
Broken-stone road.....	1-75	1-54	1-48	1-41
Very dry & smooth.....	1-53	1-38	1-34	1-27
Moist or dusty.....	1-53	1-38	1-34	1-27
With ruts and mud.....	1-33	1-24	1-21	1-16
Deep ruts and thick mud.....	1-19	1-14	1-12	1-10
Pavement, dry.....	1-90	1-65	1-57	1-38
" muddy.....	1-69	1-50	1-44	1-34

From the above table it is apparent how important is the condition in which the best made road is kept, and how greatly the labor of draught is increased by mud or dust on its surface. The character of the vehicle is also seen to have great influence on the degree of friction.

It is also found that on compressible roads, such as earth, sand, gravel, &c., the resistance is independent of the velocity. On roads of broken stones and on pavements, the resistance increases with the velocity; but the increase is less in proportion as the road is smoother and the vehicle is better suspended.

On roads of broken stones and on pavements, the resistance is sensibly proportional to the pressure, and inversely proportional to the radius of the wheels. It is independent of the number of the wheels, and nearly so of the breadth of the tire.—On compressible roads the resistance decreases when the breadth of the tire increases.

PLANK ROADS.

Plan and Cross Section of a Plank Road.

The most valuable improvement since McAdam's, and one superior to his in many localities, is the recent invention of covering roads with planks. Plank roads were introduced in Canada by the governor general, Lord Sydenham, who had seen their utility in Russia. In 1834, the first one was there constructed, (leading from Toronto eastward), and since then five hundred miles of them have been there built. In the United States, the one from Syracuse to Central Square, N. Y., led the way, being finished in July, 1846; and its great success has already caused the construction of four or five hundred miles in this state, and the projection of twice as many more in it, and in New Jersey, Ohio, Michigan, Wisconsin, etc.

In the most generally approved system, two parallel rows of small sticks of timber (called indifferently *sleeper*s, *stringers* or *sills*) are imbedded in the

road, three or four feet apart. Planks, eight feet long and three or four inches thick, are laid upon these sticks, across them, at right angles to their direction. A side track of earth to turn out upon, is carefully graded. Deep ditches are dug on each side, to ensure perfect drainage; and thus is formed a plank road.

The benefits of covering the earth with some better material has been indicated on page 188, and the peculiar advantages of this plank covering will be more fully made known, when we shall have discussed in order the various details of construction.*

LAYING THEM OUT.

The waste of labor caused by unnecessary ascents in a road, has already been pointed out. It was also shown that it is profitable to the traveller to go two or three thousand feet around to avoid ascending a hill a hundred feet high; though the cost of constructing the additional length of road partially counterbalances this consideration. It was also proved that the smoother the surface of the road was made, the more injurious proportionally were such ascents. They are therefore especially objectionable on plank roads which hold an intermediate place between common roads and railroads. Some distinguished engineers have been led astray on this point. Their arguments, if carried to their full extent, would lead to the construction of railroads also with similar steep grades. It is true, as they state, that a given load can be drawn up a much steeper hill on a plank road than on a common one, the friction on the former being so much less, but (as proven on pages 34 and 35, which see) this will lessen in an equally increased ratio the advantages of the level portions of the road. Let us assume the resistance of friction, or "sticktion," (as Professor Whewell calls it,) on a plank road to be one-third of that on a good earth road. It will therefore be one-sixtieth of the weight carried, if that of the earth be one-twentieth. If, now, a horse can draw one ton on the level earth road, the total resistance will be doubled when he comes to a hill which rises one foot in going twenty, (1 in 20,) and he will be able to draw only half a ton up this hill, and therefore his load on the level parts of the road would be but half a ton; for it would be useless for him to take more to the hill than he could drag up it. Now suppose the same road to be plank'd, and this hill to remain untouched. On the level portions the same horse can now draw three tons, by our hypothesis. But the hill, rising 1 in 20, will offer a resistance three times as great as does the "sticktion" of the plank road, and the whole resistance in going up it will therefore be four times as great as on a level. The horse can therefore draw only one-fourth of his former load, or only three-quarters of a ton, which is consequently the limit of his load on the level. Thus then this hill has brought down the gain of the plank road over the earth to only a quarter of a ton, instead of two tons, which it would be were the hill removed. Therefore, in laying out a plank road, it is indispensable, in order to secure all the benefits which can be derived from it, to avoid or cut down all steep ascents.

A very short rise, of even considerable steepness, may, however, be allowed to remain, to save expense; since a horse can, for a short time, put forth extra exertion to overcome such an increased resistance; and the danger of slipping is avoided by descending upon the earthen track.

A plank road, lately laid out, under the supervision of Mr. Geddes, between Cazenovia and Chittenango, N. Y., is an excellent exemplification of the true principles of roadmaking. Both these villages are situated on the "Chittenango creek," the former being 800 ft. higher than the latter. The most level common road between these villages rises more than 1,200 feet in going from Chittenango to Cazenovia, and rises more than 400 feet in

* Hon. Philo White's report to the Council of Wisconsin, February, 1848, embodies a very extended and systematic collection of information on this subject. To it, and to the valuable published and obliging private communications of Hon. Geo. Geddes, C.E., (who first introduced and naturalized this improvement in the United States) the author is much indebted, as also to many other recent sources.

§ *Mecanique Industrielle*, p. 507.

|| *Aide-Memoire de Mecanique*, p. 337.

going from Gazenovia to Chittenango, in spite of this latter place being 800 feet lower. It thus adds one half to the ascent and labor, going in one direction, and in the other direction it goes up hill one-half the height, which should have been a continuous descent. The line of the plank road, however, by following the creek (crossing it five times,) ascends only the necessary 800 feet in one direction, and has no ascents in the other, with two or three trifling exceptions of a few feet in all admitted in order to save expense. There is a nearly perpendicular fall in the creek of 140 feet. To overcome this, it was necessary to commence, far below the falls, to climb up the steep hill-side, following up the sides of the lateral ravines, until they were narrow enough to bridge, and then turning and following back the opposite sides till the main valley was again reached. The extreme rise is at the rate of one foot to the rod, (1 in 164;) and this only for short distances, and in only three instances, with a much less grade, or a level, intervening. The line passes through a dense forest, which supplied its material, being cut into plank by sawmills erected in a gulf never before approached by a wheeled carriage.

WIDTH.

A single track of plank, eight feet wide, with an earthen turn-out track beside it, of twelve feet, will in almost all cases be sufficient. This gives twenty feet for the least width necessary between the inside top lines of the ditches, the width of which is to be added, making about two rods on level ground. If extra cuttings or fillings be required, the width occupied by their slopes must be added to this.—An earthen road of eight feet wide on each side of the plank track, has sometimes been adopted. The New York general plank road law fixed four rods (66 feet) as the least permissible width that plank roads might be laid out. This provision has since been repealed.

Wider plank tracks were at first employed. In Canada single tracks were made from 9 to 12 feet wide. But it was found, on the 12-foot Toronto road, after seven years' use, that the planks were worn only in the middle seven or eight feet, and that the remaining four or five feet of the surface had not even lost the marks of the saw. One-third of the planking was therefore useless, and one-third of the expenditure wasted.

A double plank track will rarely be necessary.—No one without experience in the matter can credit the amount of travel which one such track can accommodate. Over a single track near Syracuse, 161,000 teams passed in two years, averaging over 220 teams per day, and during three days 720 passed daily. The earthen turn-out track must, however, be kept in good order, and this is easy, if it slope off properly to the ditch, for it is not cut with any continuous lengthwise ruts, but is only passed over by the wheels of the wagons which turn off from the track, and return to it. They thus move in curves, which would very rarely exactly hit each other, and this travel, being spread nearly uniformly over the earth, tends to keep it in shape rather than to disturb it.

If, however, there is so much travel that the earth track will not remain in good order, then this travel will pay for the double track which it requires. But this should be made in two separate eight-foot tracks, and not in one wide one of 16 or 24 feet, as was at first the practice. On a wide track the travel will generally be near its middle, and will thus wear out the planks very unequally, besides depressing them in their centre, and making the ends spring up, and when it passes near one end that will tilt up, and loosen the other. Besides, when a light vehicle wishes to pass a loaded one moving in the centre, as it naturally will, the former will be greatly delayed in waiting for the other to turn aside, or else will have one wheel crowded off into the ditch. But where there are two separate tracks, the whole width of one is at the service of the light vehicle. On a sixteen-foot track near Toronto, the planks having become loose and unsettled, were sawn in two in the centre, and this imperfect double track, even without any turn-out path between worked better than its original state. An experienced constructor states that if he were desired to build a road fifty feet wide, he would make it in separate eight-foot tracks.

A wide track of 16 feet plank has sometimes been

divided into two of eight feet, by spiking down scantling 20 feet long, and six inches square, along the middle of the road, at intervals of 100 feet in the clear, between each scantling. This, however, only partially remedies the objections adduced.

When the ground is of such a very unsettled and yielding nature, such as loose sand, marsh, &c., that a solid turn out track of earth cannot be made, planks, sixteen feet long, may be used, resting on three, four, or five sleepers, crowning in the middle three or four inches, and the ends sprung down, and pinned to the outer sleepers.

To be continued.

We commence below, the republication of a portion of an exceedingly interesting article which appeared in the Edinburgh Review, upon the subject of railways. The article was afterwards published by itself, with a preface, explanatory of the object of the article with which we commence our first extract. It goes on to show what railroads should be, to fulfil the mechanical, commercial, and moral condition, essential to their prosperity.

Mechanically.

1. That the drainage be efficient, and the substructure firm.
2. That the sleepers, whether of wood, or stone; or metal, should possess sufficient bearing surface to prevent their crushing into the ballast beneath the rolling loads.
3. That the surface-bearing of the rails on the sleepers should be as continued and extended as practicable.
4. That the rails should be of such a section in vertical depth, that the maximum load on them may not induce deflection.
5. That the rails should be of a width proportioned to the loads rolling over them, increasing the breadth as the load increases, on the same principle that a broad wheel is used with a heavy wagon on a highway. And that in case it be found advantageous to run very heavy engines, the upper surface of the rails should be steeled to resist abrasion.
6. That the joints of the rails should be so secured as to be immovable beneath the rolling loads, yet permitting free expansion, and contraction, so that there be no deflection, but an equable surface throughout.
7. That on curves the rails should be bent by a machine, so as to prevent the occurrence of tangential lines and sinuosities.
8. That the maximum weight on the wheel tyres of the engines and carriages should be considerably within the limit tending to produce deflection or abrasion of the rails, or crushing of the sleepers or substructure, or the treading out of the tyres. Neglect of this causes enormous waste of steam power.
9. That the construction of the engine should be so arranged as to keep the centre of gravity low, and the base extended, in order to prevent mischievous and dangerous oscillation.
10. That the carriages and the wagons should be made as long and as wide as the curves and the width of the railway will permit, in order to prevent oscillation, and to economise space, material, and labor in working.
11. That each carriage or wagon should maintain steadiness by its length, without trammeling the wheels, which should be free to move laterally, to suit the curves or inequalities of the rails, and avoid friction.
12. That the wheel tyres should be made of dense iron or of steel, so as not to be subject to wear, and that they should be kept as light as may be consistent with strength, in order to diminish centrifugal action. That the section of the tyres should be such as to permit their application to the wheels by pressure, without heating and cooling and that the fastenings should not require the piercing of holes through the tread of the tyre, which is a source of great risk. That the wheels should be solid discs of timber or of plate iron, in order at all times to preserve a true circular form, and prevent the fanning action produced by open spokes at high speed, which helps to waste steam power and retard the train.
13. That the wheels should be free to revolve on the axle, and the axle in the boxes, permitting four

movements, thus ensuring the minimum of friction, and diminishing the chance of heating. That the lubrication of the axles in the boxes should be ensured by their revolving in a bath of grease or oil, in constant contact with the lower side.

14. That the springs should be thoroughly flexible and elastic, to prevent all blows or shocks between the carriages and the rails; and that the wheels under each carriage should be sufficiently numerous to prevent any injurious oscillation from acting on a single spring.

15. That the breaks applied to retard the carriages and trains should not so act on the wheels, as to make the wheels sledge or slide on the rails, but that the retarding force necessary to absorb the momentum should be produced by friction between the breaks and the rails directly, thus to prevent the rails from being destroyed at the joints and driven out of the chairs or attachments. Stations should be on elevations, to facilitate starting with little steam pressure, and stopping with little use of the breaks.

16. That every separate carriage and wagon should be provided with traction and buffer springs to prevent snatches and concussions in starting and stopping.

17. That trains ought never to be increased in the number of carriages or wagons, so as to require enormous traction and buffer springs.

18. That the whole of the rolling structures should be as light as may be consistent with strength.

19. That no carriage or wagon should have a greater load on a pair of wheels than is placed on the driving wheels of the engine.

20. That Tank engines of very large size, used without Tenders for fuel and water, should not be permitted, being more mischievous to the road than the Tender engines. The tender was originally a contrivance to relieve small engines of their weight. To add the weight to engines already too heavy, is a most wasteful contrivance.

Commercially.

1. The more frequent the trains the better the public will be served.
2. Light engines and trains, i. e., small engines and large carriages, can be worked more economically than larger engines and long trains.
3. The same principle applies to light goods viz., frequent despatches and fast travelling, precisely as the town carriages now work their traffic.
4. A kind of man-handling of goods wagons is wasteful. Long and large wagons should be drawn by engine power into stations under sheds, with alternate lines of rails and ordinary highways, and discharged by cranes like canal boats. Short wagons, man-handled, are very expensive railway stock.
5. Short lines in the environs of towns, should be worked by small five minutes' trains, like omnibuses. Passengers do not object to wait for the next train when the trains are in quick succession.
6. That highways may, in many cases, be advantageously laid down with rails for horse transit on the same gauge, to communicate with branches or main lines of railway.
7. That landowners may, with great advantage, construct cheap lines through their own estates, on which to place their farms.
8. That in many cases it would be for their advantage to give the land needful to construct lines of railway.
9. That when the traffic of both goods and passengers is desired in maximum, the true mode is to make two lines for passengers and fast traffic, and a third line for goods and slow traffic, and to provide also a parallel line of highway close to it.—The North Woolwich Branch of the Eastern Counties line is a sample of this. Being obliged, by act of Parliament, to make a parallel highway, the directors are precluded from charging too high prices, and streets of houses are gradually accumulating. At no great distance of time this line will be a railway through a town on the same level. Future towns will be thus constructed.
- For the accommodation of the wealthier classes, willing to pay for speed and accommodation, it would be desirable to institute subscription trains of great lightness and speed, carrying, say seventy to one hundred first-class passengers, with light luggage, and accommodation for a few servants

A train of this kind, consisting of an engine and tender, break van, with accommodation for fourteen servants and luggage, and a light first-class for sixty-four passengers, would cost, as it appears by a document put into our hands, £2,200. It would travel at fifty miles per hour without stopping, and do one hundred miles per day. The total expense for 600 miles per week throughout the year would be less than £1,000, including interest at five per cent., coke, oil, grease, charges, repairs, and depreciation. This is about thirty shillings per train.—Take, for example, the Brighton line. There are many gentlemen who would travel backwards and forwards every day if they could do it in two hours, and employ the travelling time in reading or writing. Seventy-eight pounds per annum would be just two shillings and sixpence each journey. Now supposing each seat numbered, and an ivory ticket, transferable, issued to the taker of the seat, it is probable that in some cases three persons would club to take a ticket amongst them for two days per week each. The profit to the company by such an arrangement would be enormous.

Total revenue first year say.....£5,000
Total outlay for first year in capital and expenses.....3,200

Profit.....£1,800

Revenue second year.....5,000
Expenses.....1,000

Profit.....£4,000

This principle is used in what are called excursion trains, making the transaction a certainty to the company; and there is no doubt that it might be carried on extensively. A company of gentlemen might surely take their railway carriage on job, as an individual does his private carriage, or as a house is let by the year.

A train of this kind might be run from London to Liverpool, and *vice versa*, in five hours, starting at 7 A. M. and arriving at noon; starting again at 6 P. M. and arriving at 11, would leave six hours interval in London or Liverpool for business. This, with a carriage fitted for reading and writing, and with not more than five stoppages to water and coke and without loss of time in ticket collection, would surely be a great advantage to the higher order of the mercantile community.

Supposing the rent of a seat to be £250 per annum for two persons jointly, the annual revenue from 64 would be.....£16,000
First cost of two trains, say.....£5,000
First year's expenses, say.....1,000

9,000

Profit.....£7,000

Revenue, second year.....16,000
Expenses.....4,000

Profit.....£12,000

Maintenance of way with such light weights would be practically nil.

Large roomy seats with folding reading desks are contemplated in this arrangement. Eight separate bodies to the carriage.

The remaining problem is—are there sixty-four first class merchants in London and Liverpool who would set their hands and seals to such an agreement between themselves and the company? Or if not, how otherwise, and what annual sum would they give? Fast travelling can be had at a moderate price if the customers can be made permanent.

Morally.

1. That the public should never be regarded as a mere "oyster," or a paying machine, without claims to justice.

2. That the public should be used as a tradesman uses his permanent customers—fairly.

3. That the public should consider the welfare of the shareholder, who ought to have interest for his money.

4. That in the question of alteration of times and prices, faith should ever be kept with the public, and no advantage taken for the purpose of exorbitant gain.

5. That no exorbitant charges should be made, as tending to incite mischievous competition.

"*Vires acquirit cundo*"—gathering strength as it goes—onward marches the railway system, gradually sloughing off the old and effete—the practice proven defects—and replacing them with newer and more efficient appliances, some of a permanent and some of an ephemeral character, but always progressive. And, in truth, throughout all the arts of life we get very much of the knowledge of what will do, by successive trials of what will not do. And this truth even Mr. Watt frequently proclaimed of his own mechanical doings, when in the social circle. Of the waste of capital involved in railway making we do not care to speak much, save as a warning for the future. "Gone is gone;" but the real waste has in truth been small. Changing hands has been the chief phenomenon, and tho' it is pitiable to think that the trust property of the widow and the orphan should pass over to Hudson—who, after all, was but a mock King of Railways by the aid of juggling financiers—still they were to blame who purchased railway shares for them at absurd premiums. And as for those who took shares in lines with the idea of a firm and safe ten per cent. interest, without labor, and managed by unpaid directors, we can but wonder at the ignorance that imagined such a thing possible while public securities yielded but three-and-a-half, and iron and coal were lying side by side in unlimited quantities, and surplus laborers crying out for employment. It is written that man shall earn his living by the sweat of his brow—or of his brain; and although some few jugglers contrive to evade this law, and cheat themselves of happiness while cheating their neighbors of a livelihood, still this cannot be done in the mass. There is no ten per cent. on free capital to be had; it must be worked hard for, or a monopoly of some brain-work must be obtained to procure it as a tribute. Otherwise, why should mankind pay tribute?

In the civil engineering of railways, abridging distance between distant points is one main consideration: and the chief works of construction for this purpose are tunnels, viaducts, and bridges, the latter being a technical abbreviation from the verb to *abridge*. Tunnels are a comparatively simple affair, a mere question of time and work. Bridges and viaducts are works of structure, requiring skill and science of the highest kind to achieve perfection therein, bearing in mind two objects, the minimum cost of construction, with the maximum of durability.

Bridges can only be of seven kinds:—1. Arches self-contained, as in a semicircular form. 2. Arches segmental or elliptical, depending on abutments for support. Both these arches depend for support on their power of resisting compression of their particles. 3. Girders self-contained, the upper portion resisting compression with the tension of the lower portion for an abutment. 4. Counterbalanced girders or levers, resting on piers at their centres, in which case the compression is at the lower side, and the tension at the upper. 5. Girders of the lever form firmly fixed upon heavy abutments, with their lightest ends meeting together over the space. 6. Tension bars, tightly stretched between opposite heavy abutments. 7. Catenarian or suspension bridges, consisting of slack chains passing over lofty piers, and sustained by counterbalancing abutments.

The advent of railways, and the multitudinous circumstances with which they had to deal, in crossing over rivers, and under and over canals and roads of all kinds, requiring the minimum of headway, gave rise to the large adoption of the girder bridge, which, in its many ramifications, may almost be considered as the railway bridge, *par excellence*. Cast-iron girders, with their lower webs considerably larger than their upper, was the first arrangement for small spans. As knowledge grew, this imperfection was amended by wrought-iron tension rods below. Then came in the wrought-iron girders, the earliest sample of which was the lattice bridge. A bridge of this kind, by Sir John Macneil, the ends being counterbalanced by masses of cast-iron, may be seen spanning the canal on the line from Dublin to Drogheda. This lattice bridge, depending wholly on uncertain rivets, is the worst form of wrought-iron girder that could be devised.

The next step was the wrought-iron box girder formed of boiler plate riveted together as a rectangular tube. This has been followed up by the hollow tubular girders spanning the Conway and Menai. In all these girders the principle really involved is that of a roof truss—i. e., the tie-beam or plate below serves as a tension fulcrum for the rigid arch or rafters to abut on. For the essential principle is, that if the girder be parallel top and bottom, it should be of great depth to resist cracking, or that it should be arched to some extent, precisely as the roof, the rafters of which are the most vertical, has the greatest strength of resistance to the vertical load. The bridges of the most important forms may be thus classed:

To be Continued.

Delaware and Hudson Canal Co. Annual Report.

Below we give the substance of the last annual report of this company. The following is a statement of the business of the company for the past year, ending March 1, 1850.

To coal on hand March 1, 1849.....	\$210,339 65
Mining coal.....	276,220 36
Railroad transportation and repairs.....	216,154 21
Freight of coal to Rondout.....	441,632 31
Canal repair and superintendence.....	99,158 44
Labor and expense at Rondout.....	50,532 13
Interest on State stock.....	13,500 00
Rent, salaries, current expenses, etc., N. Y.....	16,599 72
Balance.....	843,476 01
	\$2,157,612 83

By sale of coal.....	\$1,817,819 14
Canal and railroad tolls.....	34,817 95
Interest received, profits of barges, real estate, etc.....	131,173 24
Coal on hand.....	173,803 50
	\$2,157,612 83

Balance.....\$843,476 01
which is over 16½ per cent. on the capital stock of the year.

The following is a statement of articles transported on the Delaware and Hudson canal during the year 1849.

Merchandise, 16,927; plaster, 820; cement, 18,596; tanner's bark, 659; leather and hides, 4,339; stone, brick and lime, 2,960; millstones, 200; lath, staves and hoop-poles, 550; manufactures of wood, 1,734; glass and glass ware, 799; charcoal, 1,583; sundries, posts, rails, pig iron, etc., 4,345; coal screenings up canal, 748—total tons, 54,260. Cords of wood, 328; number of shingles, pine 105,000; do. hemlock, 462,500; ship timber, in cubic feet, 49,900; hard wood lumber, in board measure, 2,226,691; pine, do. do., 783,380; hemlock, do. do., 5,435,833.

The following is a statement of tolls received on the Delaware and Hudson canal and railroad in each year since the completion of the works.

1830.....	\$16,422 44
1831.....	20,554 64
1832.....	28,717 51
1833.....	37,004 58
1834.....	36,946 07
1835.....	41,976 82
1836.....	45,154 73
1837.....	44,832 42
1838.....	40,328 38
1839.....	40,095 26
1840.....	35,450 46
1841.....	39,388 19
1842.....	33,894 93
1843.....	30,996 53
1844.....	33,525 61
1845.....	25,880 92
1846.....	26,068 65
1847.....	38,971 34
1848.....	46,548 54
1849.....	44,817 95

\$697,575 97

to half the consumption of the town of Newcastle.
To be continued.

AMERICAN RAILROAD JOURNAL.

Saturday, April 6, 1850.

FOWLER M. RAY'S Patent India-rubber Railroad CAR SPRING.

Troy, February 27, 1850.

We have been using your India-rubber Car Springs for nearly two years—and we take pleasure in saying that in our opinion the rubber has to a certain extent already, and may eventually entirely supersede all other Springs for Railroad Car purposes. We now use it entirely for Draw Springs and Bumpers, considering it better and lighter than steel.

During our two years' experience in the use of it, we have not known any to lose their elasticity, or fail in any way; and we cheerfully recommend the rubber for railroad car springs. Very respectfully,

EATON, GILBERT & CO.

Boston, March 5, 1850.

In answer to your enquiry about India-rubber Springs, I have to say that we have used them to a considerable extent on both freight and passenger cars, and also on several of our tenders; and I am very well satisfied that they answer all the purposes for which they are intended. I believe the India-rubber will soon supersede all other springs for cars and tenders. Yours truly,

S. M. FELTON,
Supt. Fitchburg Railroad.Office of the New Jersey Railroad Co.,
Jersey City, March 7, 1850.

This is to certify that we have had Mr. F. M. Ray's India-rubber Springs in constant use under our cars, and as Bumper Springs for upwards of two years, and they have in every way given perfect satisfaction.

The present form of spring we deem far superior to the form of Disk, having used both forms, although we have none of those made in Disks at present in use.

We take pleasure in recommending these springs to all railroad companies.

J. P. JACKSON, Vice Pres.,
New Jersey Railroad and Trans. Co.

Roxbury, February 28, 1850.

In compliance with your request, I take great pleasure in stating the result of my experience in the use of "Ray's Patented Vulcanised India-rubber Car and Engine Springs." We have used them nearly two years, and never had one fail in any way. The cold weather does not affect them, as it has other rubber springs we have used.

With sixteen years' experience as superintendent of machinery on the Boston and Providence railroad, I take pleasure in saying that your springs are the best we ever used, or I ever saw used elsewhere. We have 20 cars rigged with them, of which I can say that the springs are as good now as when first applied. I put 24 lbs. of the rubber under the forward end of one of our heaviest engines, taking off 250 lbs. of steel springs—it has been in use 18 months, and is in as good condition now as when first put under the engine.

Very respectfully yours,

GEO. S. GRIGGS,

Supt. of Machinery, Boston and Prov. R.R.

Supt. Office N.Y. & H. R.R.,
New York, March 8, 1850.

This is to certify that we have used the Rubber Springs manufactured by Mr. F. M. Ray for the past twenty months, "both for Passenger and Freight Car Springs and Bumpers, and of different sizes," and have in every case given entire satisfaction, and I consider them the best spring now in use.

M. SLOAT, Supt.

Jersey City, March 9, 1850.

This is to certify that the present form of Mr. F. M. Ray's India-rubber Car Spring I consider far superior to the form of Disk, having used both forms.

I take pleasure in recommending these springs to all railroad companies. DAVID H. BAKER,

Foreman of Car Shop of N.J. R.R. & Trans. Co.

Harlem R.R. Depot,
New York, March 7, 1850.

This is to certify that we have used Mr. F. M. Ray's India-rubber Springs for over eighteen months, and find them to be easy and durable, and recommend them to railroad companies as being superior to anything we have tried.

J. M. SMART,
Foreman at 43d St. Depot.

American Railway Guide, AND POCKET COMPANION FOR THE UNITED STATES;

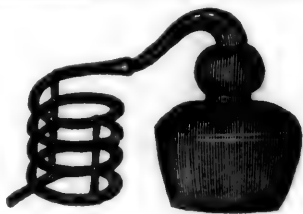
CONTAINING Correct Tables, showing the time for starting of trains from all stations, distances, fares, etc., on all the Railway lines in the U. States; also many of the principal Steamboat and Stage routes—accompanied by a complete RAILWAY MAP. Price, single copies 10 cts., or \$1 per annum. Published on the first of every month, corrected from returns furnished by the Railway Superintendents throughout the Union.

This book has been compiled somewhat on the plan of Bradshaw's Guide, with such improvements in size, form and arrangement as have seemed desirable; and the publisher confidently hopes it will not be found liable to the objections of incompleteness and incorrectness, which have been made, and justly too, against various other similar works heretofore issued.

The subscriber having had the management of the NEW YORK PATHFINDER almost from its commencement, has enjoyed superior facilities in obtaining information relating to the thoroughfares of travel, and is therefore well qualified to prosecute with success the arduous undertaking of furnishing a complete and correct national guide book.

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AN excellent opportunity now occurs to a practical Machinist, of WELL ESTABLISHED REPUTATION, and some capital, to engage extensively in the STEAM ENGINE, BOILER and FOUNDRY BUSINESS.

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Pacific Railroad.

PHILADELPHIA CONVENTION.

We have received the proceedings of this convention held on the 1st inst. We have not room for the proceedings this week, but shall give them in our next. W. B. Ogden, of Chicago, acted as President of the convention.

Connecticut.

A charter has been obtained and a company formed for the construction of a railroad from Williamantic to New-Boston. The charter requires \$200,000 to be subscribed before the organization of the company. This sum has been subscribed, and the company has been organized by the election of the following directors; Alfred Smith, Calvin Day, W. S. Lee, James M. Bunce, W. D. Ely, E. D. Amidon, H. N. Slater, W. Farnum, and Amasa Carpenter. Hartford subscribed \$15,000; North and South Woodstock subscribed \$20,000; liberal subscriptions were received from other pla-

ces on the route, and the Hartford, Providence and Fishkill railroad companies has subscribed \$190,000.

Columbus and Lake Erie Railroad Co.

At the annual meeting on the 21st ult, the following named persons were elected directors of this company:—J. Dille, A. J. Smith, Thomas Blanchard, S. M. Knowlton, S. Corning, James L. Birkey, James R. Stanbery, John D. Struble, Robert Graham, Daniel S. Norton, C. T. Sherman, Miller Moody, and Geo. W. Penney.

J. Dille, President.

A. J. Smith, Treasurer.

Geo. W. Penney, Secretary and Superintendent.

J. W. Webb, Chief Engineer.

A gentleman connected with the road writes us thus,— "we shall commence laying iron on our road the first week in April, and by the middle of May, if the weather is favorable, run trains to Belville, 14 miles south of Mansfield, on the first day of September expect to run trains to Newark, 116 miles from Sandusky city.

Annual of Scientific Discovery.

Messrs. Gould, Kendell and Linch, of Boston have published a work of about 400 pages, 13 mo., entitled the ANNUAL OF SCIENTIFIC DISCOVERY; or year book of facts in science and art, edited by David A. Wells and George Bliss, Jr. It is ornamented by a portrait of Prof. Agassiz, and the typographical execution does credit to the publishers.

With every disposition to speak favorably of any work got up for the purpose of recording the facts of science and art, we feel inclined to caution the editors against their too ready adoption for facts, in science, the hasty conclusions of interested parties. In fact, we cannot regard the work as any thing more than a scientific scrap book, in which are collected together the various statements put forth during the past year, in regard to science and art. These items, scattered through the columns of the newspapers and periodicals, have been very well arranged, and many of them abridged from their original dimensions. Probably a large portion of the articles have been published in all the leading newspapers of the great cities, many of them certainly in this Journal; but from the want of an index to the newspapers, the larger portion of the matter is practically lost.

Without a particle of knowledge as to the editors of this work in question, we see plainly, on every page of the book, evidence that they can claim very little acquaintance with the practical details of any department of science or art. Their book has been taken up and published as facts, the exaggerated statements of unskilled pretension and the inflated advertisements issued by the owners of new patents.

A book of this sort should be subjected to the severe tests of tried experience and the judgment of practical men. Instead of this, they are too ready to admit for truth whatever "has been printed in the newspapers!"

Take, for example, on page 259 the extracts from a letter, "on the quicksilver deposits of California," published in the *Merchant's Magazine*, written by Dr. Fenchwarger—"Rocks and mountains to the height of several thousand feet have already been found to consist of nothing but cinnabar and many more will be undoubtedly developed etc."

Statements of such an exaggerated character may be paraded in a periodical of the day, whose business it is to note the progress of discovery and call forth suggestions in every form;—but to see them finally recorded as settled conclusions in a

work claiming to give scientific results in an authoritative form, bespeaks too much the spirit of new book making.

The work entirely omits a vast number of most valuable inventions brought to public notice, or into use the past year. Dick's anti-friction press, Lightner's axle boxes, etc., are not named in the work, while the description of many patents of very little practical value, are introduced.

We might fairly pursue this topic further, but we forbear. The general aim and scope of the work is praiseworthy, and it may yet become in future years, a valuable record of the facts of science and the useful arts.

For the American Railroad Journal.

Modulus of Strength for Bridge Trusses.

Let l = length of truss, t = weight of truss, and w = the greatest distributed weight the truss can bear; then $\frac{t+w}{l} \times l$ = a number which is constant for all trusses of the same plan, same proportions and same materials, and which has the remarkable property of expressing the greatest length that such a truss could be built capable of sustaining its own weight.

This number I propose to call the *modulus of strength*, which will be very convenient, as affording a simple measure, or means of comparing the strength of different plans of trussing, by trials on models, or trusses of whatever size or length.

A bar of cast iron 1 inch square and 12 inches between supports, will bear a uniformly distributed load of about 4000 lbs., and will weigh about 3 lbs. Then, $\frac{3+4000}{3} \times 1 \text{ ft.} = 1334\frac{1}{3}$, the modulus of strength for rectangular cast iron girders having a length equal to 12 times the depth. In the same manner we find the modulus for a girder of a length equal to 10 times its depth to be about 1601. Hence, girders of this description would be liable to break with their own weights, if of greater lengths than 1334 ft. and 1601 ft. respectively, and could not be regarded as safe to bear their own weights at much over one-fourth of those lengths.

Mr. Fairbairn gives $\frac{80ad}{l}$ tons = the breaking weight for the wrought iron tubular bridge, where a = the cross-section of the bottom plates in square inches, d = the depth and l = the length of the tube between supports.

This I take to be the breaking weight when placed in the centre, and it must be doubled for the load uniformly distributed over the length.

The Conway tube is 400 ft. = l , 25 ft. = d , and $517 = a$. Hence, $2 \frac{80 \times 517 \times 25}{400} = 5170$ tons = to the breaking weight when distributed, including the weight of the tube, which is 1300 tons, or say 1250 tons for the part between supports.

Applying my formula $\frac{t+w}{l}$, in this case, it becomes $\frac{5170}{1250} \times 400 = 1654.4$ which is the modulus for the tubular bridge, and also for Mr Fairbairn's wrought iron girders, to which he applies the same formula for the breaking weight.

The modulus here determined shows that such tubes and girders could only sustain their own weight at 1654 ft., that they are a trifle stronger than rectangular cast iron girders of a length equal to ten times their depth, and that the Conway tube would sustain at the extreme, but little over four times its own weight, including its own weight.

I may hereafter give the results of further applications of the formula above given, for determining the moduli for different plans of bridges, and some of my own among the rest.

S. WHIPPLE.

Maine.

Railroad from Bangor to Oldtown.

A. C. Morton Esq., chief engineer of the Atlantic and St. Lawrence railroad, has just completed a survey for a road to connect the above places.

The following is a statement of the estimated cost of the work.

Grading, bridging, etc. as per statement A.	\$234,300
14.41 miles of main and side track, at \$6.-	
514, B.	93,867
Average cost of grading and track per mile.	
\$23,866, Cars and engines, as per statement.	
..... C.	67,600
Station buildings.	D. 18,500
Branches to accommodate mills.	E. 40,984
Turning tables.	5,000
Land and damages.	37,000

Total cost to Oldtown.....\$497,251
To carry the road to Milford requires a further expenditure of..... 43,691

Total cost to Oldtown and Milford.\$540,942

The whole length of line is 13.75 miles. It follows the bank of the Penobscot river so as to accommodate the numerous lumber manufacturing establishments on the route. The whole fall between the termini of the road is 96 feet, all of which, may easily, be made available to manufacturing purposes.

The grades are favorable, all being in the direction of the traffic. The annual estimated income of the road is \$118,000. Expenses \$71,000 leaving \$47,000 applicable to dividends: being 9 per cent on the cost.

We are somewhat familiar with the route of the proposed road, and the resources of the line, and we have no doubt that if the road could be built it would pay well, but we presume that the heavy cost of the work will be at present an insuperable objection to its construction. We think that this road is of much more consequence to Bangor and the adjoining towns, than the proposed road to Waterville, as it would bring into use and notice, the magnificent water power of the Penobscot and stimulate the growth of manufacturing towns along its line.

California.

T. BUTLER KING'S REPORT.

We give in another column, that portion of a very elaborate report recently made by Mr. King, descriptive of the mineral resources of California. Mr. King's statements are fully up to the most extravagant reports that have yet come from that quarter, and if correct, California is certainly the richest country in the world, in mineral wealth.

The report gives a very favorable view of the resources of that country in all respects; and great credit will be attached to it from the fact that Mr. King was sent to California for the purpose of presenting to government a correct and authentic statement of its resources, climate, etc. It will give a new impulse to the vast tide of emigration which is setting in that direction; and but two or three years will elapse before California will, in population, take a respectable position, not only in wealth but in population among the old States of the Union.

Mr. King estimates the value of gold collected up to January 1, 1850, at \$40,000,000, and the amount which will be obtained this year at \$50,000,000.—He thinks the supply, from all appearances, to be

inexhaustible. If he is correct in his calculations, the immense addition of gold from this quarter must affect its value as a medium of exchange.—History furnishes no other instance of so great an addition of the precious metal to the old stock in so short a time.

The result, thus far, must have convinced the most sceptical of the richness of California, in surface washings. But whether the vein mining is to be profitable remains to be proved. Opinion is worth but little here. Gold mining is proverbially delusive and uncertain in its results. And it by no means follows because surface washings are profitable, that after these are exhausted, working the vein stone is to be equally so. Mr. King says:

The gold region of California is between four and five hundred miles long, and from forty to fifty miles broad, following the line of the Sierra Nevada. Further discoveries may, and probably will, increase the area. It embraces within its limits those extensive ranges of hills which rise on the eastern border of the plain of the Sacramento and San Joaquin, and extending eastwardly from 50 to 60 miles, they attain an elevation of about 4000 feet, and terminate at the base of the main ridge of the Sierra Nevada. There are numerous streams which have their sources in the springs of the Sierra, and receive the water from its melting snows, and that which falls in rain during the wet season.

These streams form rivers, which have cut their channels through the ranges of foot-hills westwardly to the plain, and disembogue into the Sacramento and San Joaquin. These rivers are from ten to fifteen, and probably some of them twenty miles apart.

The principal formation, or substratum, in these hills, is talcose slate; the substratum, sometimes penetrating to a great depth, is quartz. This, however, does not cover the entire face of the country, but extends in large bodies in various directions—is found in masses and small fragments on the surface, and seen along the ravines, and in the mountains overhanging the rivers, and in the hill-sides in its original beds. It crops out in the valleys and on the tops of the hills, and forms a striking feature of the entire country over which it extends.—From innumerable evidences and indications, it has come to be the universally admitted opinion among the miners and intelligent men who have examined this region, that the gold, whether in detached particles and pieces, or in veins, was created in combination with the quartz. Gold is not found on the surface of the country, presenting the appearance of having been thrown up and scattered in all directions by volcanic action. It is only found in particular localities, and attended by peculiar circumstances and indications. It is found in the bars and shoals of the rivers—in ravines, and in what are called the dry diggings.

The rivers, in forming their channels, or breaking their way through the hills, have come in contact with the quartz containing the gold veins, and by constant attrition cut the gold into fine flakes and dust, and it is found among the sand and gravel of their beds at those places where the swiftness of the current reduces it, in the dry season, to the narrowest possible limits, and where a wide margin is, consequently, left on each side, over which the water rushes, during the wet season, with great force.

As the velocity of some streams is greater than others, so is the gold found in fine or coarse particles, apparent by corresponding to the degree of attrition to which it has been exposed. The water from the hills and upper valleys, in finding its way to the rivers, has cut deep ravines, and wherever it came in contact with the quartz, has dissolved or crumbled it to pieces.

In the dry season these channels are mostly without water, and gold is found in the beds and margins of many of them in large quantities, but in a much coarser state than in the rivers; owing, undoubtedly to the fact, that the flow and temporary continuance of the current, which has reduced it to smooth shapes, not unlike pebbles, but had not sufficient force to cut it into flakes or dust.

The dry diggings are places where quartz containing gold has cropped out, and been disintegrated, crumbled to fragments, pebbles, and dust, by the action of water and the atmosphere. The gold has been left as it was made, in all imaginable shapes; in pieces of all sizes, from one grain to several pounds in weight. The evidences that it was created in combination with quartz are too numerous and striking to admit of doubt or cavil. They are found in combination in great quantities.

A very large proportion of the pieces of gold found in these situations have more or less of these quartz adhering to them. In many specimens they are so combined they cannot be separated without reducing the whole mass to powder, and subjecting it to the action of quicksilver.

This gold, not having been exposed to the attrition of a strong current of water, retains, in a great degree, its original conformation.

These diggings, in some places, spread over valleys of considerable extent, which have the appearance of an alluvion, formed by washings from the adjoining hills, of decomposed quartz, and slate earth, and vegetable matter.

In addition to these facts it is beyond doubt true, that several vein mines have been discovered in the quartz, from which numerous specimens have been taken, showing the minute connection between the gold and the rock and indicating a value hitherto unknown in gold mining.

These veins do not present the appearance of places where gold may have been lodged by some violent eruption. It is combined with the quartz in all imaginable forms and degrees of richness.

The rivers present very striking, and, it would seem, conclusive evidence respecting the quantity of gold remaining undiscovered in the quartz veins. It is not probable that the gold in the dry diggings, and that in the rivers—the former in lumps, the latter in dust—was created by different processes. That which is found in the rivers has undoubtedly been cut or worn from the veins in the rock, with which their currents have come in contact. All of them appear to be equally rich. This is shown by the fact that a laboring man may collect nearly as much in one river as he can in another. They intersect and cut through the gold region, running from east to west, at irregular distances of fifteen to twenty, and perhaps some of them thirty miles apart.

Hence it appears that the gold veins are equally rich in all parts of the most remarkable section of country. Were it wanting, there are further proofs of this in the ravines and dry diggings which uniformly confirm what nature so plainly shows in the rivers.

For the purpose of forming some opinion respecting the probable amount of value of treasure in the gold region, it will be proper to state the estimates which have been made of the quantity collected since its discovery.

Gold was first discovered on the south fork of the American river, at a place called Sutter's mill, now Coloma—late in May or early in June, 1848. Information which could be relied on announcing this discovery, was not received in this city until late in the following autumn.

No immigration into the mines could, therefore have taken place from the old states in that year. The number of miners was, consequently, limited to the population of the territory—some five hundred men from Oregon—Mexicans and other foreigners who happened to be in the country, or came into it during the summer or autumn, and the Indians who were employed by, or sold their gold to the whites.

It is supposed there were not far from five thousand men employed in collecting gold during that season. If we suppose they obtained an average of one thousand dollars each—which is regarded by well informed persons as a low estimate—the aggregate amount will be \$5,000,000.

It is not probable that during the first part of the season there were more than five or six thousand Americans in the mines. This would swell the whole number, including foreigners, to about 20,000 the beginning of September. This period embraced about half of the season during which gold may be successfully collected in the rivers.

Very particular and extensive inquiries respecting the daily earnings and acquisitions of the miners lead to the opinion that they averaged an ounce per day. This is believed by many to be a low estimate; but from the best information I was able to procure, I am of opinion it approaches very near actual results. The half of the season, up to the 1st of September, would give sixty-five working days, and to each laborer, at \$16 per ounce, \$1,040. If, therefore, we assume \$1,000 as the average collected by each laborer, we shall probably not go beyond the mark.

This would give an aggregate of \$20,000,000 for the first half of the season—15,000,000 of which was probably collected by foreigners. During the last half of the season, the number of foreigners was very much diminished, and, perhaps, did not exceed 5,000. At this time, the American immigration had come in by land and sea, and the number of our fellow citizens in the mines had, as was estimated, increased to between forty and fifty thousand. They were most of them inexperienced in mining, and it is probable the results of their labors were not as great as has been estimated for the first part of the season, and experienced miners assuming that the average of half an ounce per day ought to be considered as reasonable, it would give an aggregate of about \$20,000,000. If from this we deduct one-fourth, on account of the early commencement of the wet season, we have an estimate of \$15,000,000; at least five of which was collected by foreigners, who possessed many advantages from their experience in mining and knowledge of the country.

These estimates give, as the result of the operations in the mines for 1848 and 1849, the round sum of \$40,000,000—one half of which was probably collected and carried out of the country by foreigners.

From the best information I could obtain, I am led to believe that at least \$20,000,000 of the \$40,000,000 were taken from the rivers, and that their richness has not been sensibly diminished, except in a few locations, which had early attracted large bodies of miners. This amount has principally been taken from the northern rivers, or those which empty into the Sacramento; the southern rivers, or those which flow into the San Joaquin, having been comparatively but little resorted to until near the close of the last season. These rivers are however believed, by those who have visited them, to be richer in the precious metal than those in the northern part of the gold region.

There is one river which, from reported recent discoveries, and not included in the description of those flowing into the great plain west of the Sierra Nevada, is as rich in gold as any of them. That is the Trinity, which rises north of the headwaters of the Sacramento, and discharges into the Pacific not far from the fortieth degree of north latitude.

There are as nearly as my recollection serves me, twelve principal rivers in which gold has been found; but most of the twenty millions in the above estimate was taken from six or seven of them, where it was first discovered and most accessible.

Adopting the hypothesis that the gold found in the beds of these streams has been cut or worn from the veins in the quartz through which they have forced their way, and considering the fact that they are all rich, and are said to be nearly equally productive, we may form some idea of the vast amount of treasure remaining undisturbed in the veins which run through the masses of rock in various directions over a space of forty or fifty miles wide, and near five hundred miles long.

If we may be allowed to form a conjecture respecting the richness of these veins from the quantity of lump or coarse gold found in the dry diggings, where it appears to occupy nearly the same superficies it did originally in the rock—its specific gravity being sufficient to resist ordinary moving causes—we shall be led to an estimate almost beyond human calculation and belief. Yet, as far as I can perceive, there is no plausible reason why the veins which remain in the quartz may not be as valuable as those which have become separated from the decomposed rock. This matter can only be satisfactorily decided by actual discoveries.

The quicksilver mines of California are believed to be numerous, extensive and very valuable.—

There is one near San Jose, which belongs to, or is claimed by Mr. Forbes, of Tepic, in Mexico. The cinnabar ore, which produces the quicksilver, lies near the surface, is easily procured, and believed to be remarkably productive.

Discoveries of other mines are reported, but no certain information respecting them has been made public. It is undoubtedly a fortunate circumstance that nature, in bestowing on California such vast metallic treasure, has provided, almost in its immediate neighborhood, inexhaustible stores of quicksilver, which is so essential in gold mining.

The policy of government with respect to these mines of cinnabar should, in my opinion, be quite different from that which I have felt it my duty to suggest for the management of the gold region.

As soon as the necessary explorations can be made, and proper information obtained, it will be well to offer these mines for sale, and commit their development to the hands of private enterprise.

It is believed that there are extensive beds of silver, iron and copper ores in the territory; but there is no information sufficiently accurate respecting them, to justify any statement of their existence or value.

Great American Engineering AND MECHANICAL WORK, just published in A medium folio, 75 cts.

Part III of "Specimens of the Stone, Iron and Timber Bridges, &c. &c. of the United States Railroads." By George Duggan, Architect and Civil Engineer.

The present part contains beautifully executed plans, elevations, sections and isometrical views of the elegant timber arch 275 feet span, at Cascade Creek, Pa. on the line of the N. Y. & Erie R. R., and of a plank bridge 100 feet span across the Mahawk River near Rome, on the line of the U. and S. R. R. with the specifications, estimates, bills of timber, iron, etc.

N. B.—This work is published by subscription of the most eminent in the engineering profession of the U. States, and will be completed in 12 parts, at 75 cents each to those who remit their names and subscriptions before the 1st May next, after which the price will be raised to \$1 per part.

To those making a present remittance of \$5, and the remainder \$4, when they have been supplied with the first six parts, the work will be forwarded regularly as published. Parties remitting \$9 shall receive it monthly post-free in any part of the United States.

"It is a work that was a great desideratum, and must prove of great benefit to the engineering profession generally; and especially to the tyro in practical engineering and mechanical knowledge; in truth it strikes us, that it would require years of labor and patient toil on the part of a young engineer to prepare the drawings, and collect the information that will be embodied in this work, and can now be secured for the trifling sum of \$9."—[Scientific Amer. March 16, 1850.]

In connection with this subject (Iron Railroad Structures) we take occasion to call attention again to Mr. Duggan's valuable and expensive publication, exhibiting drawings, with full descriptions of the various stone, iron and wooden bridges, viaducts, tunnels, culverts, etc., of all the Railroads in the United States. Mr. Duggan is an accomplished Architect and Civil Engineer, who came from Ireland to this country to exercise his profession; but finding Railroad construction here, in many respects, different from that he had been accustomed to in Europe, he applied himself to the study of our system; and the fruits of his researches and investigations embodied in this work, are well calculated to meet the exigencies of engineers, and to assist draughtsmen, bridge builders, mechanics and students. The work will be supplied to subscribers only, in 12 parts, at 75 cents each.—[N. Y. Journal of Commerce, Feb. 14, 1850.]

Published by GEORGE DUGGAN, 172 East Broadway, New York.

CAUTION.

RAILROAD COMPANIES and others are hereby cautioned against using or vending our improvement for easing the lateral motion as applied on Railroad Cars. Letters Patent having been granted to us in 1841, any party or parties so making or using said improvement without license from us will be proceeded against according to law.

DAVENPORT & BRIDGES.

Spikes, Spikes, Spikes.

ANY person wishing a simple and effective Spike Machine, or a number of them, may be supplied by addressing J. W. FLACK, Troy, N. Y. March 6, 1850.

WHISTLER MONUMENT Association.

MAJOR T. S. BROWN having, in leaving this country, resigned his office as Treasurer of this Association, the Committee appointed for that purpose have selected as his successor GEO. M. DEXTER, Esq., of Boston.

Those desiring to subscribe will therefore please direct their communications to Geo. M. Dexter, Civil Engineer, etc., Boston, Mass.

A. W. CRAVEN, Secretary, etc.
New York, February 22, 1850.

United States Railroad Guide and Steamboat Journal.

CONTAINING OFFICIAL TIME ADVERTISEMENTS, Tables of Stations, Distances, Fares, Time, etc., with much miscellaneous matter for the travelling public. Price 12 cents a copy. Yearly subscription \$1. Published at 43 Ann street, New York.

Henry J. Ibbotson,

IMPORTER of Sheffield and Birmingham Goods.
Also, Agent for the Manufacture of Telegraph Wire.
218 PEARL ST., NEW YORK.

F. M. Ray's India Rubber Spring.

New York and Erie Railroad Shops.
Piermont, March 26, 1850.

This will certify that from practical experience in the use of Fowler M. Ray's India rubber Car Springs, I believe them to be far superior to any others now in use.

I have never known them to be affected by any change of temperature, as other Rubber Springs have been affected on this road.

I am at the present time repairing a Passenger Car that Mr. Ray and myself mounted with his springs about two years and eight months since.

The springs are at the present time as perfect, to all appearances, as when first applied to the car.

Respectfully yours,

HORACE B. GARDNER,
Foreman of the Car Shops.

Old Colony Railroad Office,
Boston, March 6, 1850.

EDWARD CRANE, Esq.,

President New England Car Co.,

Dear Sir: In compliance with your request I would state that the Old Colony Railroad Company have had in use upon their road, India-rubber Springs furnished by your company, for more than eighteen months past, during which time they have been extensively used under Passenger and Freight Cars, Locomotive Tenders, and for Drawer and Buffing Springs, with the most perfect success. The elasticity and consistency of the Rubber has never been unfavorably affected by either extremes of heat or cold—and from the experience which we have had in the use of Rubber Springs, I think them well adapted for railroad purposes—and therefore we have for some months past used Rubber almost exclusively, in all places where springs are required.

Respectfully yours, etc.,

JAS. H. MOORE,
Supt. O. C. Road.

February 25, 1850.

From practical observation of the use of the India-rubber Car Springs, manufactured and sold by your company, we are entirely satisfied in their application, and do not hesitate to recommend them as elastic, durable, requiring no repairs for years, and retaining their consistency during all extremes of weather. We have applied them for the past two years, and consider them superior for all railroad purposes.

Yours truly,

OSGOOD BRADLEY, Car Builder, Worcester.
T. & C. WASON, do. Springfield.
DEAN, PACKARD & MILLS, do. do.
DAVENPORT & BRIDGES, do. Cambridgeport.

Fall River, February 2, 1850.

In answer to yours of the 20th ult. I would say that this company has for some 10 or 12 months past been using "Ray's India-rubber Springs." We have applied them to both passenger and freight cars with uniform success. They have invariably preserved their elasticity and consistency through all the extremes of weather; and we are now applying them whenever the steel spring fails. I am well satisfied that they are particularly adapted for railroad purposes.

Very respectfully yours,

GEO. HAVEN,
Supt. Fall River Railroad.

Office New Jersey Railroad Co.,
Jersey City, March 8, 1850.

FOWLER M. RAY, Esq.,

Dear Sir: In answer to your enquiries respecting the operation of the Vulcanized Rubber Springs, purchased by our company from you some two years since, I reply that they are superior to any spring in use, (that I have either seen or heard of).

The improved form of your spring, consisting of a solid piece of vulcanized rubber with bands on the outside, is far superior to your first form, consisting of disks of rubber with metallic plates interposed.

The last named form was tried, if you recollect, at a much earlier period; and then was replaced by your last form.

I have no hesitation in saying that your springs have given entire satisfaction, and most cheerfully recommend them to railroad companies throughout the country for the following reasons:

- 1st. The cost is 30 per cent. less.
- 2d. Saving of weight on each car of 8 wheels from 700 to 800 lbs.
- 3d. Less care and attention is required, as they are not liable to get out of repair.
- 4th. A great saving is secured in the wear and tear of the cars and rails from their great elasticity.
- 5th. The freedom from noise.
- 6th. There is greater safety in case of accident, as they cannot be broken.
- 7th. The comfort of passengers is enhanced sufficiently to pay the expense, waiving all the other reasons that I have given.

Should this fail to satisfy any person enquiring, you are at liberty to refer to me, No. 150 Washington St., Jersey City.

Yours respectfully,

T. L. SMITH, Supt.

New York, March 11, 1850.

I have used the Patent India-rubber Spring purchased of Mr. Ray, upon the cars of the New York and New Haven Railroad, and have found them efficient and economical; and when applied to the axles and draw springs, believe them to be quite equal to any in use. I have found a combination of these springs with a steel spring under the transom beam a very satisfactory arrangement, and am now using this plan in all new cars.

Yours respectfully,

ROBERT SCHUYLER.

Passenger Car Linings.

THE Advertiser continues to make to order the Enamelled Car Linings which have been so highly approved the last three years, and are now exclusively used by all the Northern Railroads. No pains are spared to get out new styles, and adapt them to the tastes of every consumer.

Orders addressed to CHARLES STODDER, No. 75 Kilby street, Boston, will have prompt attention.
March 23, 1850. 2m

To Contractors.

SEALED PROPOSALS will be received at the Office of the Nashville and Chattanooga Railroad Company in Chattanooga until the 20th day of May next, for the graduation and masonry of the Chattanooga Division of said Road—embracing a distance of 27 1/2 miles.

The graduation will be heavy for about 15 miles, (in crossing Raccoon Mountain, and passing around Lookout Mountain bluffs), the balance, average work. The masonry will consist chiefly of cut stone Piers for Tennessee River Bridge, (about 4,000 Perches), Piers for running Water Bridge, (about 2,000 Perches), and Pier for Lookout Creek Bridge, about 500 Perches.

Sealed proposals will also be received at the same time and place, for the graduation of 10 miles of the Eastern end of the Winchester Division—embracing some heavy work. Also the masonry of Elk River and Widow's Creek Bridges.

Plans and Profiles of the Work will be exhibited, specifications furnished, and all other desired information given, on application to Mr. James A. Corry, the Engineer in charge of the work, at the Company's Office in Chattanooga, from the 10th of May until the day of letting.

Before making bids the line should be thoroughly examined. The depths of the Cuts and Embankments can be ascertained from the center stakes. The work to be commenced immediately after the letting. And that portion from Chattanooga to Lookout Bluffs to be completed by the 1st of December next. The other sections to be finished successively on toward the West end of the Division—the last by the 1st of October, 1851.

The most satisfactory testimonials will be required. The payments will be made in cash—receiving the usual 20 per cent. until the completion of the work.

By order of the Board.

JAMES H. GRANT, Chief Eng.
Nashville, Tenn., March 14, 1850.

TO CONTRACTORS.

NOTICE is hereby given, that from 30 to 60 miles of the Orange and Alexandria Railroad will be ready for examination between 1st and 15th of April next. The road passes through a very healthy and fertile region, and embraces an amount of work every way worthy of the attention of able and experienced men.

The Company prefers to let the whole work of construction in contracts of not less than 30 miles, and for that purpose parties wishing further information are invited to call at the office in Alexandria.

The bids will be made on a basis of payments in cash to the amount of 85 per cent, and the remaining 15 per cent in the stock of the company. They must be sent to this office not later than the 16th day of April next, to be submitted to the meeting of the Board of Directors to be held on the 18th of the same. By order of the Board.

T. C. ATKINSON,
Chief Engineer.

For the information of parties at a distance, it is well to state that the Orange and Alexandria Railroad is about 90 miles long, and extends from Alexandria through Fairfax, Prince William, Fauquier, Culpeper and Orange counties to Gordonsville, a point on the completed portion of the Virginia Central Railroad, formerly called the Louisa railroad.

An inspection of the map will show that its connections promise to make it as valuable a thoroughfare as any in the Union.

To Contractors.

THE Election of Directors of the Queenston Suspension Bridge Company having taken place, the Company are now prepared to receive Plans for the Bridge and Tenders for its erection. All communications to be directed, GILBERT McMICKEN, 1ml1*
Queenston, Canada W.

To Miners and Mining Companies.

THE undersigned would respectfully call the attention of those persons engaged in mineral operations on Lake Superior to the following list of articles which will be sold on accommodating terms, viz:

- 600 bbls. Corn fed No. 1 Mess Pork.
 - 500 " Stall fed Mess Beef.
 - 25,000 lbs. " Sugar cured canvassed" Hams.
 - 2,200 " Dried Beef.
 - 60,000 " " Kiln dried" Corn Meal,
 - 500 bush. White "Field" Beans.
 - 300 " Canada" Peas.
 - 500 " Dried Apples.
 - 100 bbls. and half bbls. "cucumber" Pickles.
 - 50 " Sour Kroust.
 - 30 bush. Onions.
 - 1,000 Beefs' Tongues Smoked and in Pickle.
 - 10,000 lbs. " Mould" Candles.
 - 10,000 " "Hard" Soap.
- Also, a full and large supply of all articles that may be required by Mining Companies and those connected with them.
C. A. TROWBRIDGE,
127 Jefferson Avenue, Detroit, Michigan.

Gas Fixtures.

FIXTURES for Burning Gas for Lighting Public Buildings, Private Dwellings, Stores and Factories, manufactured by the subscriber in great variety. Orders by Mail, or left at the Factory on Causeway street, will be promptly attended to.

HENRY N. HOOPER & CO.

Boston, March 23, 1850. 6m13

Railroad Iron.

3,000 TONS C. L. MAKE 63 1/2 lbs. per yard, now landing and to arrive.

Also contracts made for future delivery of above superior make English Iron.

300 Tons Banks Best Iron, Round, Square and Flat.
200 " English Bar " " " "
10 " 9-15 Square Iron for Railroad Spikes.

For sale in lots to suit purchasers by

DAVID W. WETMORE.

New York, March 26, 1850. 3m

Pennsylvania Railroad.

PROPOSALS will be received at Blairsville, Indiana county, until the 18th of April next, for grading the Western Division of the Pennsylvania Railroad.

The work to be contracted for, embraces three short Tunnels, a number of Stone Bridges and Culverts, and some very heavy excavations and embankments.

For further information apply to EDWARD M. LEE, Esq., Associate Engineer, at Blairsville.

J. EDGAR THOMSON, Chief Eng.
Engineers' Department, Pennsylvania R.R.,
Philadelphia, March 23, 1850.

To the Proprietors of Rolling Mills and Iron Works.

THE Undersigned—Proprietors of Townsend's Furnace and Machine Shop, Albany—are extensively engaged in the manufacture of Machinery and fixtures for Iron, and Copper Rolling Mills, and Iron Works. Having paid particular attention to the manufacture of *Rolls* (Rollers), both *chilled and dry-sand*, they feel confident that they can execute orders for such castings in a satisfactory manner. And to give assurance of this, they beg leave to refer to the following named persons, proprietors and managers of some of the most extensive rolling mills in the country, viz: Jno. F. Winslow, J. Tuckerman, H. Burden, W. Burt, J. & J. Rogers, Saltus & Co., J. B. Bailey, L. G. B. Cannon, Hawkins & Atwater, etc., etc.

F. & T. TOWNSEND.

Albany, August 18, 1849.

Arch St. Machine Shop.

BIRKENBINE, MARTIN & TROTTER,
Makers of

STEAM ENGINES,

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HYDRAULIC MACHINERY, NO. 16 ARCH STREET, PHILADELPHIA.

Will construct Steam Engines, Pumps, for Draining Mines and Land; supplying Water to Towns, Factories, Farms, etc;

Also, Street Stops, Fire Plugs, Water Tanks, and Hydraulic Rams, with

(BIRKENBINE'S PATENT VALVES.)

B., M. & T. contract for Warming and Ventilating Buildings by Steam or Warm Water.

THE NEWCASTLE MANUFACTURING Co. continue to furnish at the Works, situated in the town of Newcastle, Del., Locomotive and other steam engines, Jack Screws, Wrought Iron Work and Brass and Iron Castings, of all kinds connected with Steamboats, Railroads, etc.; Mill Gearing of every description; Cast Wheels (chilled) of any pattern and size, with Axles fitted, also with wrought tires, Springs, Boxes and bolts for Cars; Driving and other wheels for Locomotives.

The works being on an extensive scale, all orders will be executed with promptness and despatch. Communications addressed to Mr. William H. Dobbs, Superintendent, will meet with immediate attention.

ANDREW C. GRAY,

President of the Newcastle Manuf. Co.

Brown's Old Established SCALE WARE HOUSE,

NO. 234 WATER ST., NEW YORK.

THE Subscriber, Practical Manufacturer of Scales of every description, respectfully asks the attention of Railroad Companies to his Improved Wrought Iron Railroad Track and Depot Scales which for strength, durability, accuracy, convenience in weighing, and beauty of workmanship, are not surpassed by any others in this country.

He is aware that this is rather a bold assertion for him to make, yet he can say with confidence that they have but to be tried to give them precedence over all others.

J. L. BROWN.

Bank Scales made to order, and all Scales of his make Warranted in every particular.

References given if required.

4tf

ENGINEERS.

Banks, C. W.,

Civil Engineer, Vicksburg, Miss.

Berrien, John M.,

Michigan Central Railroad, Marshall, Mich.

Buckland, George,

Troy and Greenbush Railroad.

Clement, Wm. H.,

Little Miami Railroad, Cincinnati, Ohio.

Cozzens, W. H.,

Engineer and Surveyor, St. Louis, Mo.

Davidson, M. O.,

Eckhart Mines, Allegheny Co., Maryland.

Fisk, Charles B.,

Cumberland and Ohio Canal, Washington, D. C.

Felton, S. M.,

Fitchburg Railroad, Boston, Mass.

Floyd-Jones, Charles,

South Oyster Bay, L. I.

Gzowski, Mr.,

St. Lawrence & Atlantic Railroad, Montreal, Canada.

Gilbert, Wm. B.,

Rutland and Burlington Railroad, Rutland, Vt.

Grant, James H.,

Nashville and Chattanooga R. R., Nashville, Tenn.

Harry, P.,

Binghamton, New York.

Holcomb, F. P.

Southwestern Railroad, Macon, Ga.

Johnson, Edwin F.

New York and Boston Railroad, Middletown Ct.

Latrobe, B. H.,

Baltimore and Ohio Railroad, Baltimore, Md.

Miller, J. F.,

Worcester and Nashua Railroad, Worcester, Mass.

Morris, Elwood,

Schuylkill Navigation, Schuylkill Haven, Pa.

Morton, A. C.,

Atlantic and St. Lawrence Railroad, Portland, Me.

McRae, John,

South Carolina Railroad, Charleston, S. C.

Nott, Samuel,

Lawrence and Manchester Railroad, Boston.

Prichard, M. B.,

East Tennessee and Georgia R. R., Cleveland, Tenn.

Roebbling, John A.,

Trenton, N. J.

Roberts, Solomon W.,

Ohio and Pennsylvania Railroad, Pittsburgh, Pa.

Sanford, C. O.,

South Side Railroad, Virginia.

Schlatter, Charles L.,

Northern Railroad (Ogdensburg), Malone, N. Y.

Sours, Peter,

Rahway, New Jersey.

Stark, George.,

Bost., Con. and Mont. R. R., Meredith Bridge, N. H.

Steele, J. Dutton,

Pottstown, Pa.

Trimble, Isaac R.,

Philad., Wil. & Baltimore Railroad, Wilmington, Del.

Tinkham, A. W.,

United States Fort, Bucksport, Me.

Thomson, J. Edgar.,

Pennsylvania (Central) Railroad, Philadelphia.

Whipple, S.,

Civil Engineer and Bridge Builder, Utica, N. Y.

Williams, E. P.,

Auburn and Schenectady Railroad, Auburn, N. Y.

Williams, Charles H.,

Milwaukee, Wisconsin.

Wormeley, Preble,

Central Ohio Railroad, Zanesville, Ohio.

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DUNLAP'S HOTEL,

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" E. Pratt & Brother, Baltimore.

John Barstow, Esq., Providence.

Lewis Bullard, Esq., Boston.

February 9, 1850.

6m*

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Sup't Transportation Providence and Worcester R.R., Providence, R.I. Has had 13 years' experience in Operating Railroads. Will go South or West if applied to.

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Of all Descriptions, Warranted Good.

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BAILEY-LANE WORKS, SHEFFIELD,

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A full Stock of Steel and Files at all times on hand.

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For Inclined Planes, Suspension Bridges, Standing Rigging, Mines, Cranes, Derrick, Tilters, &c., by

JOHN A. ROEBLING, Civil Engineer,

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Agents for Avalon Railroad Iron and Nail Works.
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**RAIL ROAD CAR &
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3-4 and 6-4 Damasks, Union and Worsted; Mo-
reens, Rattinets, Cloths, Silk and Cotton Velvets,
English Bunting**S. W. Hill,**Mining Engineer and Surveyor, Eagle River,
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Chief Engineer Croton Aqueduct, New York.

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Iron Railing, Bank and Vault Doors, Iron Shutters
Bridge and Roof Bolts, Heavy Jobbing and Forging
of all kinds.

For particulars see Adv. in another column.

To Engineers and Surveyors.E. BROWN AND SON Mathematical inst. mak-
ers No. 27 Fulton Slip, New York, make and keep
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Surveyors Compasses, and Chains, Cases of Mathe-
matical drawing insts. various qualities, together with
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A Pig Iron, Hammered Railroad Car and Locomo-
tive Axles, Force Pumps of the most approved con-
struction for Railroad Water Stations and Hydraulic
Rams, etc., etc.
July, 27, 1849.**James Herron, Civil Engineer,**[OF THE UNITED STATES NAVY YARD,
PENSACOLA, FLORIDA.,

PATENTEE OF THE

HERRON RAILWAY TRACK.Models of this Track, on the most improved plans,
may be seen at the Engineer's office of the New York
and Erie Railroad.**To Railroad Companies.****—WROUGHT IRON WHEELS—**

SAFETY AND ECONOMY.

**NORRIS' LOCOMOTIVE WORKS,
SCHENECTADY, NEW YORK,**Are Manufacturing Wrought Iron Driving, Truck,
Tender, and Car Wheels—made from the best Ameri-
can Iron. Address E. S. NORRIS.
May 16, 1849.**Machinery Warehouse.**S. C. HILLS, No. 43 Fulton street, New York, has
constantly for sale Steam Engines, Boilers, Lathes,
Chucks, Drills, Planers, Force and Suction Pumps;
Tonnage, Morticing and Boring Machines, Shingle
Machines, Bolt and Nut Machines, Belting, Oil, Iron
and Lead Pipe; Rubber, Percha and Leather Hose,
&c., &c.S. C. H.'s arrangements with several machine shops
are such that he can supply, at very short notice, large
quantities of machinery.

November 23, 1849.

Cruse & Burke,Civil Engineers, Architects and Surveyors,
Office, New York State Institution of Civil Engineers,
STATE HALL, ALBANY, N. Y.Drawings, specifications and surveys accurately ex-
ecuted. Pupils instructed theoretically and practical-
ly at a moderate premium.

May 26, 1849.

Eaton, Gilbert & Co.,Railroad Car, Coach and Omnibus Builders,
TROY, N. Y.**Hudson River Foundry,
THOMAS & COLLINS,**

130 Quay Street, Albany.

To Railroad & Navigation Cos.Mr. M. BUTT HEWSON, Civil Engineer, offers his
services to Companies about to carry out the surveys
or works of a line of Navigation or Railroad. He can
give satisfactory references in New York City as to his
professional qualifications; and will therefore merely
refer here to the fact of his having been engaged for
upwards of two years conducting important Public
Works for the British Government.Communications will find Mr. Hewson at the office
of the Railroad Journal, 54 Wall Street, New York.**Walter R. Johnson,**CIVIL AND MINING ENGINEER AND AT-
torney for Patents. Office and Laboratory, F St.,
opposite the Patent office, Washington, D. C.**Cop Waste.**CLEAN COP WASTE, suitable for cleaning Rail-
road, Steamboat and Stationary Engines, con-
stantly on hand and for sale byKENNEDY & GELSTON,
5½ Pine St., New York.

October 27, 1849,

3m

Ranstead, Dearborn & Co.,

MANUFACTURERS OF

LOCOMOTIVE CRANKS AND CAR AXLES,

ALSO

WROUGHT IRON SHAFTING,

And All Kinds of Hammered Shapes.

Forge at Commercial Point, Dorchester,
Office 25 Foster's Wharf, opposite No. 21½ Broad St.
BOSTON.**IRON.****Iron.**Pig Iron, Anthracite and Charcoal; Boiler and Flue
Iron, Spring and Blistered Steel, Nail Rods, Best Re-
fined Bar Iron, Railroad Iron, Car Axles, Nails, Stove
Castings, Cast Iron Pipes of all sizes, Railway Chairs
of approved patterns for sale byCOLEMAN, KELTON & CAMPBELL,
109 N. Water St., Philadelphia.**IRONDALE PIG METAL, MANUFACTURED**and for sale by the Bloomsburg Railroad Iron Co.
DUDLEY FISHER, Treasurer.
75 N. Water St., Philadelphia.**Railroad Iron.**500 Tons, afloat, weighing 57 pounds per lineal
yard, for sale by

COLLINS, VOSE & CO.,

159 South St.

New York, November 17, 1849.

1m46

Railroad Iron.1675 Tons, weighing about 61 lbs. per yard, 90
tons, weighing about 52 lbs. per yard, and
825 tons, weighing about 53½ lbs. per yard, of the lat-
est and most approved patterns of T rail, for sale by

BOORMAN, JOHNSTON & CO.,

119 Greenwich street.

New York, Feb. 25, 1850.

N.B.—B. J. & Co are also prepared to take con-
tracts for English rails, delivered in any of the Atlan-
tic ports of the United States.**Railroad Iron.**THE UNDERSIGNED, HAVING made arrange-
ments abroad, are prepared to contract for the de-
livery of Foreign rails, of approved brands upon the
most favorable terms.They will also make contracts for American rails,
made at their Trenton works, from Andover Iron, in
whole or in part, as may be agreed upon.They are prepared to furnish Telegraph, Spring and
Market Wire; Braziers and Wire Rods; Rivets and
Merchant Bars to order, all made exclusively from An-
dover Iron. The attention of parties who require iron
of the very best quality for special purposes, is respect-
fully invited.COOPER & HEWITT,
17 Burling Slip, New York.

February 15, 1850.

Glendon Refined Iron.Round Iron, Band Iron, Hoop Iron,
Square " Flat " Scroll "

Axles, Locomotive Tyres,

Manufactured at the Glendon Mills, East Boston, for
sale by **GEORGE GARDNER & CO.,**

5 Liberty Square, Boston, Mass.

Sept. 15, 1849.

3m37

**PATENT HAMMERED RAILROAD, SHIP &
BOAT SPIKES.**—The Albany Iron Works
have always on hand, of their own manufacture, a
large assortment of Railroad, Ship and Boat Spikes
from 2 to 12 inches in length, and of any form of head.
From the excellence of the material always used in
their manufacture, and their very general use for rail-
roads and other purposes in this country, the manu-
facturers have no hesitation in warranting them fully
equal to the best spikes in market, both as to quality
and appearance. All orders addressed to the subscrib-
ers at the works will be promptly executed.**JOHN F. WINSLOW, Agent.**

Albany Iron and Nail Works, Troy, N. Y.

The above Spikes may be had at factory prices, of
Erastus Corning & Co Albany; Meritt & Co., New
York; E. Pratt & Brother, Es. Annapolis, Md.**LAP—WELDED
WROUGHT IRON TUBES**

FOR

TUBULAR BOILERS,FROM ONE AND A QUARTER TO SEVEN
INCHES IN DIAMETER.THE ONLY Tubes of the same quality and man-
ufacture as those so extensively used in England,
Scotland, France and Germany, for Locomotive, Ma-
rine and other Steam Engine Boilers.**THOMAS PROSSER & SON, Patentees,**
28 Platt street, New York.**Railroad Iron.**THE UNDERSIGNED ARE PREPARED TO
contract for the delivery of English Railroad Iron
of favorite brands, during the Spring. They also re-
ceive orders for the importation of Pig, Bar, Sheet, etc.
Iron.**THOMAS B. SANDS & CO.,**

22 South William street,

February 3, 1849.

New York.

Iron Store.THE Subscribers, having the selling agency of the
following named Rolling Mills, viz: Norristown,
Rough and Ready, Kensington, Trindell, Potts-
grove and Thorndale, can supply Railroad Companies,
Merchants and others, at the wholesale mill prices for
bars of all sizes, sheets cut to order as large as 58 in.
diameter; Railroad Iron, domestic and foreign; Loco-
motive tire welded to given size; Chairs and Spikes;
Iron for shafting, locomotive and general machinery
purposes; Cast, Shear, Blister and Spring Steel; Boil-
er rivets; Copper; Pig iron, etc., etc.**MORRIS, JONES & CO.,**

Iron Merchants,

Schuylkill 7th and Market Sts., Philadelphia.

August 16, 1849.

1y33

Railroad Iron.THE MOUNT SAVAGE IRON WORKS, AL-
legany county, Maryland, having recently pass-
ed into the hands of new proprietors, are now prepar-
ed, with increased facilities, to execute orders for any
of the various patterns of Railroad Iron. Communi-
cations addressed to either of the subscribers will have
prompt attention. **J. F. WINSLOW, President**

Troy, N. Y.

ERASTUS CORNING, Albany**WARREN DELANO, Jr., N. Y.****JOHN M. FORBES, Boston.****ENOCH PRATT, Baltimore, Md.**

November 6, 1848.

Railroad Iron.THE SUBSCRIBERS ARE PREPARED TO
take orders for Railroad Iron to be made at their
Phoenix Iron Works, situated on the Schuylkill Riv-
er, near this city, and at their Safe Harbor Iron Works,
situated in Lancaster County, on the Susquehanna
river; which two establishments are now turning out
upwards of 1800 tons of finished rails per month.Companies desirous of contracting will be promptly
supplied with rails of any required pattern, and of the
very best quality.**REEVES, BUCK & CO.,**

45 North Water St., Philadelphia.

March 15, 1849.

Monument Foundry.

A. & W. DENMEAD & SON,
Corner of North and Monument Sts.,—Baltimore,

HAVING THEIR

IRON FOUNDRY AND MACHINE SHOP

In complete operation, are prepared to execute

carefully and promptly, orders for

Locomotive or Stationary Steam Engines,
Woolen, Cotton, Flour, Rice, Sugar Grist, or Saw

Mills,

Slide, Hand or Chuck Lathes,

Machinery for cutting all kinds of Gearing.

Hydraulic, Tobacco and other Presses,

Car and Locomotive patent Ring Wheels, war-

ranted,

Bridge and Mill Castings of every description,

Gas and Water Pipes of all sizes, warranted,

Railroad Wheels with best faggotted axle, fur-

nished and fitted up for use, complete

Being provided with Heavy Lathes for Bor-

ing and Turning Screws, Cylinders, etc., we can

furnish them of any pitch, length or pattern.

Old Machinery Renewed or Repaired—and

Estimates for Work in any part of the United States

furnished at short notice.

June 8, 1849.

Iron Wire.

REFINED IRON WIRE OF ALL KINDS,

Card, Reed, Cotton-flyer, Annealed, Broom,
Buckle, and Spring Wire. Also all kinds of Round,

Flat or Oval Wire, best adapted to various machine

purposes, annealed and tempered, straightened and

cut any length, manufactured and sold by

ICHABOD WASHBURN.

Worcester, Mass., May 25, 1849.

American and Foreign Iron.

FOR SALE,

300 Tons A 1, Iron Dale Foundry Iron.

100 " 1, " " " "

100 " 2, " " " "

100 " " Forge " "

400 " Wilkesbarre " "

100 " "Roaring Run" Foundry Iron.

300 " Fort " "

50 " Catoctin " "

250 " Chikiswalungo " "

50 " "Columbia" "chilling" iron, a very su-

perior article for car wheels.

75 " "Columbia" refined boiler blooms.

30 " 1 x 1/2 Slit iron.

50 " Best Penna. boiler iron.

50 " "Puddled" " "

50 " Bagnall & Sons refined bar iron.

50 " Common bar iron.

Locomotive and other boiler iron furnished to order.

GOODHUE & CO.,

New York.

64 South street

American Pig, Bloom and Boiler Iron.

HENRY THOMPSON & SON,
No 57 South Gay St., Baltimore, Md.,

Offer for sale. Hot Blast Charcoal Pig Iron made at

the Catoctin (Maryland), and Taylor (Virginia), Fur-

naces; Cold Blast Charcoal Pig Iron from the Clover-

dale and Catawba, Va., Furnaces, suitable for Wheels

or Machinery requiring extra strength; also Boiler

and Flue Iron from the mills of Edge & Hilles in Del-

aware, and best quality Boiler Blooms made from Cold

Blast Pig Iron at the Shenandoah Works, Va. The

productions of the above establishments can always be

had at the lowest market price, for approved paper.

American Pig Iron of other brands, and Rolled and

Hammered Bar Iron furnished at lowest prices. Agents

for Watson's Perth Amboy Fire Bricks, and

Rich & Cos. New York Salamander Iron Chests.

Baltimore, June 14, 1849. 6 mos

Wheel, Forge and Foundry Iron.

LOCUST GROVE Wheel Iron of great strength

and superior chilling property.
Balt. Charcoal Forge Iron, from Patuxent, Curtis

Creek and Gunpowder furnaces.

Elkridge Foundry Iron, of superior strength and

softness. Anthracite and Charcoal Iron from Penn-

sylvania and Virginia. Gas and Water Pipes, Lamp

Posts from Elkridge furnace.

LEMMON & GLENN,

6m9

62 Buchanan's Wharf, Baltimore.

Iron.

THE SUBSCRIBERS having resumed the agency
of the New-Jersey Iron Company, are prepared
to execute orders for the different kinds and sizes of
iron usually made at the works of the company, and
offer for sale on advantageous terms.—

150 tons No. 1 Boonton Foundry Pig Iron.

100 " No. 2 do. do. do.

300 " Nos. 2 & 3 Forge do. do.

100 " No. 2 Glendon do. do.

140 " Nos. 2 & 3 Lehigh Crane do. do.

100 " No. 1 Pompton Charcoal do.

100 " New-Jersey Blooms

50 " New-Jersey Faggoting Iron, for shafts

Best Bars, 1/2 to 4 inch by 1/2 to 1 inch thick.

Do do Rounds and Squares, 1/2 to 3 inch.

Rounds and Squares, 3-16 to 1 inch.

Half Rounds, 1/2 to 1 in. Ovals & Half Ovals 1/2 to 1 1/2 in.

Bands, 1 1/2 to 4 inch. Hoops, 1/2 to 2 inch.

Trunk Hoops, 1/2 to 1 1/2 in. Horse Shoe & Nut Iron.

Nail Plates. Railroad Spikes.

DUDLEY B. FULLER & Co., 139 Greenwich-

st. and 85 Broad-st.

WILLIAM JESSOP & SONS' CELEBRATED CAST-STEEL.

The subscribers have on hand, and are constantly re-

ceiving from their manufactory.

PARK WORKS, SHEFFIELD,

Double Refined Cast Steel—square, flat and octagon.

Best warranted Cast Steel—square, flat and octagon.

Best double and single Shear Steel—warranted.

Machinery Steel—round.

Best and 2d gy. Sheet Steel—for saws and other pur-

poses.

German Steel—flat and square, "W. I. & S." "Eagle"

and "Goat" stamps.

Genuine "Sykes," L Blister Steel.

Best English Blister Steel, etc., etc., etc.

All of which are offered for sale on the most favora-

ble terms by **WM. JESSOP & SONS,**

91 John street, New York.

Also by their Agents—

Curtis & Hand, 47 Commerce street, Philadelphia.

Alex'r Fullerton & Co., 119 Milk street, Boston.

Stickney & Beatty, South Charles street, Baltimore.

May 6, 1848.

Ogden & Martin's ROSENDALE CEMENT.

WE are prepared to enter into arrangements for

supplying our Cement for public works or other

purposes. We warrant the cement equal in every re-

spect to any manufactured in this country. It attains

a great degree of hardness, sets immediately under

water, and is a superior article for masonry coming in

contact with water, or requiring great strength.

For sale in tight barrels, well papered, at their office

by **OGDEN & MARTIN,** 104 Wall st.

February 16, 1850. 1y*

The above cement is used in most of the fortifica-

tions building by government.

JOHNSON, CAMMELL & Co's Celebrated Cast Steel,

AND

ENGINEERING AND MACHINE FILES,

which for quality and adaptation to mechanical uses,

have been proved superior to any in the United States.

Every description of square, octagon, flat and round

cast steel, sheet, shovel and railway spring steel, best

double and single shear steel, German steel, flat and

square, goat stamps, etc. Saw and file steel, and steel

to order for any purposes, manufactured at their Cy-

clops Steel Works Sheffield.

JOHNSON, CAMMELL & CO.,

100 William St., New York.

November 23 1849.

Railroad Iron.

1,500 Tons weighing 59 lbs. per lineal yard.

500 " " 57 " " "

500 " " 56 " " "

500 " " 60 & 61 lbs. " "

Also 2 1/2 x 7 flat rails. All the above being of approv-

ed patterns. For sale by

DAVIS, BROOKS, & CO.,

69 Broad street.

N.B.—Rails imported on commission, or at a fixed

price.

CUT NAILS OF BEST QUALITY, BAR IRON

(including Flat Rails) manufactured and for sale

by **FISHER, MORGAN & CO.,**

75 N. Water St., Philadelphia.

Railroad Iron.

OF ANY PATTERN AND WEIGHT,
Of a Favorite Brand,
And deliverable in Bond, or Duty paid, at any Port of
the U. S., contracted for on favorable terms, by

CHARLES ILLIUS,

20 Beaver St., New York.

Pig and other Iron also contracted for. Sole Agent
for "Baxter's Machine and Burning Oil"—particu-

larly adapted for "Railroads" and other Machinery—

Preferred to Sperr by the many now using it, and 25

per cent. cheaper.

Railroad Iron.

THE Undersigned, Agents for Manufacturers, are

prepared to contract to deliver Rails of superior

quality, and of any size or pattern, to any ports of dis-

charge in the United States.

COLLINS, VOSE & CO.,

158 South St.

New York, November 17, 1849.

To Steam Engine Builders.

THE Undersigned offer for sale, at less than half its

cost, the following new machinery, calculated for

an engine of 62 inches cylinder and 10 feet stroke, viz.

2 Wrought Iron Cranks, 60 inches from centre to

centre.

1 Do. do. Connecting Rod Strap.

2 Do. do. Crank Pins.

1 Eccentric Strap.

1 Diagonal Link with Brasses.

1 Cast Iron Lever Beam (forked).

The above machinery was made at the West Point

Foundry for the U. S. Steamer Missouri, without re-

gard to expense, is all finished complete for putting to-

gether, and has never been used. Drawings of the

cranks can be seen on application to

HENRY THOMPSON & SON,

No. 57 South Gay St., Baltimore, Md.

Sept. 12, 1849.

Ballard's Improved JACK-SCREW.

PATENTED.

THE ADVANTAGES OF THIS

Screw for Stone Quarries, Rail-

roads, Steam Boiler Builders, and

for other purposes are superior to

any other similar machine.

The improvement consists in be-

ing able to use either end of the

screw, as occasion requires.

It is capable of raising the heav-

iest Locomotive with ease, being

portable, strong and powerful, and

not likely to get out of order.

Many Railroad Companies and

Boiler Makers have them in use—

by whom they are highly recom-

mended.

JACK SCREWS,

of various sizes, power and price,

constantly on hand at the manufac-

tory.

No. 7 Eldridge Street,

near Division Street.

New York, Jan. 19, 1850.

To Railroad Companies and Contractors.

FOR SALE.—Two Locomotive Engines and Ten-

ders, at present in use on the Beaver Meadow

Railroad, being too light for their coal trains, but well

calculated for either gravel or light passenger trains.

They weigh, in running order, about 8 tons each—

having one pair of driving wheels 4 feet diameter, 4

truck wheels 30 inches diameter, with cylinders 10 in.

diameter, and 18 inches stroke of piston. Tenders on

4 wheels. Address **JAMES ROWLAND,**

Prest. Beaver Meadow Railroad & Coal Co.,

Philadelphia.

or, **L. CHAMBERLAIN, Sec'y,**

at Beaver Meadow, Pa.

May 19, 1849. 20tf

SPRING STEEL FOR LOCOMOTIVES, TEN-

DERERS AND CARS.—The subscriber is engaged

in manufacturing spring steel from 1 1/2 to 6 inches in

width, and of any thickness required: large quantities

are yearly furnished for railroad purposes, and wher-

ever used its quality has been approved of. The estab-

lishment being large, can execute orders with great

promptitude, at reasonable prices, and the quality war-

ranted. Address **J. F. WINSLOW, Agent,**

Albany Iron and Nail Works.

To Railroad Companies.

FOR SALE—A Second-hand Locomotive Engine and Tender, of about 10 tons weight, in good order, and warranted to perform well. Any company wanting a cheap engine for a passenger or light burden train, will rarely meet with an opportunity so favorable as the present. The engine and tender are in perfect running order, and will be tested to the satisfaction of any one wishing to purchase. Price \$1,500.

Address **J. B. MOORHEAD,**
Frazer P.O., Chester county, Pa.

P.S.—The Engine can be seen by calling on H. Osmond & Co., Car-builders, Broad st., Philadelphia.
September 6, 1849.

India-rubber for Railroad Cos.

RUBBER SPRINGS—Bearing and Buffer—Fuller's Patent—Hose from 1 to 12 inches diameter. Suction Hose. Steam Packing—from 1-16 to 2 in. thick. Rubber and Gutta Percha Bands. These articles are all warranted to give satisfaction, made under Tyer & Helm's patent, issued January, 1849.—No lead used in the composition. Will stand much higher heat than that called "Goodyear's," and is in all respects better than any in use. Proprietors of railroads do not be overcharged by pretenders.

HORACE H. DAY,

Warehouse 23 Courtlandt street.

New York, May 21, 1849.

Fire Brick.

THE Subscribers have constantly on hand Rafford's Stourbridge, Oak Farms Stourbridge, Lister, Wortley, Red and White Welsh Fire Bricks, common and fancy shapes. Also,

ROOFING SLATES,

from the best Welch quarries, and of all sizes. Also,

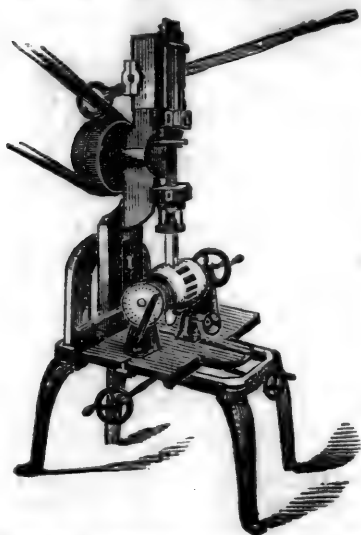
COAL,

of all kinds—Liverpool Orrell and Cannel, Scotch, New Castle, Pictou, Sidney, Cumberland, Virginia, and all kinds of Anthracite coals. Also,

Pig Iron, Salt, etc., etc., for sale at the lowest market price. Apply to

SAMUEL THOMPSON & NEPHEW,
275 Pearl and 43 Gold Sts., New York.

November, 23, 1849.

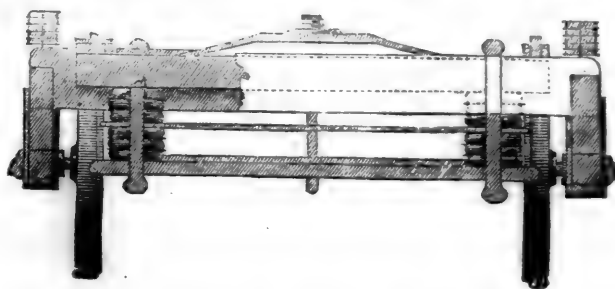
**Capt. Alfred Swingle's
PATENT BORING
& MORTISING MACHINE.**

The above Machine was invented by A. SWINGLE, of Texas, in 1846, and Letters Patent were taken out in July, 1848. As a labor saving Machine it stands unrivalled even in these days of improvements. Its uses are innumerable; it may be successfully applied to Doors, Sashes, Carriages, Wheel-Hubs, and in fact to all kinds of work where the Auger and Chisel can be brought to bear.

The only limit to the speed of the working of this machine is the heating of the tools used. It will perform at least the labor of twelve men, and in vastly better manner, and can be worked equally well by steam power or by hand. It has been used and has given universal satisfaction.

For further information apply to H. B. TERRY, 40 Wall St., New York, to whom all orders are to be addressed.

New York, December 15, 1849.

**FULLER'S PATENT
INDIA RUBBER CAR SPRINGS.**

RAILROAD COMPANIES are cautioned, before purchasing Springs, to examine the actual patents and judge for themselves.

Persons, under the Title of the New England Car Company, seeking fraudulently to invade Fuller's rights have put forth so many statements for the purpose of misleading the public, that an enumeration of some facts is absolutely necessary, for the purpose of putting persons interested upon their guard.

Fuller's patent is for the application of Discs of India-rubber with Metal Plates, for forming Springs for Railway Cars and Carriages—either one disc and two plates, or ten discs and plates, or any other number, are equally covered by the patent. Fuller is not bound to the use of short discs—he may use long discs and plates.

Ray's patent is simply and wholly the forming of air tight rubber cylinders, with hoops or bands round the outside, and the combination of elasticity of India rubber, with the elasticity of atmospheric air confined in the cylinder, and in no part of his patent is he authorized to use the form of spring which he is now fraudulently supplying to Railroad Companies. Such springs are direct and positive infringements of the very letter of Fuller's patent.

Fuller's patent is dated October, 1845, Ray's patent, August, 1848.

The spring patented by Ray never has been put in operation, and never can be made useful for Railroad cars.

A mere experiment, even if made, it is well known does not prove an invention; and it is ridiculous for such parties to hope to mislead the Presidents and Superintendents of Railroad companies, by claiming the invention because Ray alleges he made an experiment—which Fuller had made before him—had actually brought into working order, and obtained a patent for—and this too before Mr. Ray states he made his experiment—and that experiment not claimed to have been applied to a car or carriage.

Besides, the invention could not have been developed until India rubber, properly Vulcanised, could be made of a sufficient thickness. In the United States the art of vulcanising rubber by steam heat, (by which

means only can a body of rubber having any considerable thickness be vulcanised,) was not introduced until after the grant by the American government of the patent for springs to Fuller—whereas the process of vulcanising rubber by steam heat was invented in England about three years previously, and was used by Fuller there. This fact refutes entirely the claim of invention put forth by Mr. Ray, and proves the impossibility of his pretensions being true.

Fuller was the first and only inventor of the spring. A Mr. Dorr, whose connection with Mr. Goodyear is well known in this country, applied in England to Mr. Fuller, after he had published and patented his invention, and introduced another party for the purpose of obtaining the agency for the United States. They were furnished with a complete set of drawings and models, and with instructions to make arrangements for the supply of material of American manufacture—from that hour to the present not a single communication has been received from them. Some of these identical models have been traced into the hands of parties now seeking to invade Fuller's rights, and who have exhibited them as specimens of their own invention.

After this, the conveyance was made by Goodyear to certain parties here for the use for railroad springs of what he calls his Metallic rubber. Comment is unnecessary.

There are 5 or 6 different processes for the manufacture of vulcanised rubber, patented by as many different parties, some here, some in England, either of which would probably make good springs.

A large and powerful company has been organized under the name of the Rubber Company, the particulars of which shall be given hereafter.

An action has been commenced against three railroad companies for infringement; and all other parties will assuredly be prosecuted if they continue farther to infringe upon Fuller's patent.

W. C. FULLER,

The only persons authorized to supply the Springs are **G. M. KNEVITT**, 33 Broadway, N. York,
General Agent for the U. S.: and
JAS. LEE & Co., 18 India Wharf, Boston.
JOHN THORNLEY, Chestnut st., Philad.

**Patent India Rubber Steam
Packing.**

THIS article, made by the subscriber, who alone is authorized to make it, is warranted to stand as high a degree of heat as any that has been or can be made by any person—and is the article which has made the reputation of India Rubber Steam Packing and the demand therefor. A large assortment of all thicknesses requisite for any description of engines, steam pipes, valves, etc., constantly on hand and for sale by the manufacturer and patentee, who will give every information regarding its properties, mode of use, etc., at the warehouse. **JOHN GREACHEN, JR.**,
98 Broadway, opposite Trinity Church.
New York, October, 1849.

**Ibbotson, Brothers & Co's
CELEBRATED CAST STEEL**

AND

Best Cast Steel Royal Improved Files, well known as better adapted for Engineers' and Machinists' purposes than any now in use in the United States.

Every description of Square, Octagon, Flat and Round Cast Steel, Sheet, Shovel and Railway Spring Steel, etc., and Steel to order for any purposes—manufactured at their works in Sheffield—and universally known by the old stamp "Globe."

HENRY J. IBBOTSON, Agent,

218 Pearl st., New York.

February 25, 1850.

FAIRBANKS' RAILROAD SCALES.—THE subscribers are prepared to construct at short notice, *Railroad and Depot Scales*, of any desired length and capacity. Their long experience as manufacturers—their improvements in the construction of the various modifications, having reference to strength, durability, retention of adjustment, accuracy of weight and dispatch in weighing—and the long and severe tests to which their scales have been subjected—combine to ensure for these scales the universal confidence of the public.

No other scales are so extensively used upon railroads, either in the United States or Great Britain;—and the managers refer with confidence to the following in the United States.

Eastern Railroad.	Boston & Maine Railroad.
Providence Railroad.	Providence and Wor. Road.
Western Railroad.	Concord Railroad.
Old Colony Railroad.	Fitchburg Railroad.
Schenectady Railroad.	Syracuse and Utica Road.
Balt. and Offio Railroad.	Baltimore and Susq. Road.
Phila. & Reading Road.	Schuykill Valley Road.
Central (Ga.) Railroad.	Macon and Western Road.
	New York and Erie Railroad.

And other principal Railroads in the Western, Middle and Southern States.

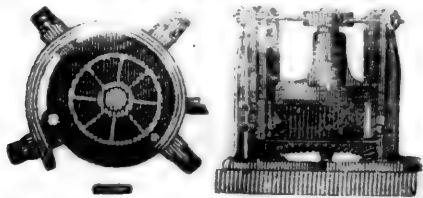
E. & F. FAIRBANKS & CO.

St. Johnsbury, Vt.

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April 22, 1849. 17

MACHINERY.

Henry Burden's Patent Revolving Shingling Machine.



THE Subscriber having recently purchased the right of this machine for the United States, now offers to make transfers of the right to run said machine, or sell to those who may be desirous to purchase the right for one or more of the States.

This machine is now in successful operation in ten or twelve iron works in and about the vicinity of Pittsburgh, also at Phoenixville and Reading, Pa., Covington Iron Works, Md., Troy Rolling Mills, and Troy Iron and Nail Factory, Troy, N. Y., where it has given universal satisfaction.

Its advantages over the ordinary Forge Hammer are numerous: considerable saving in first cost; saving in power; the entire saving of shingler's, or hammerman's wages, as no attendance whatever is necessary, it being entirely self-acting; saving in time from the quantity of work done, as one machine is capable of working the iron from sixty puddling furnaces; saving of waste, as nothing but the scoria is thrown off, and that most effectually; saving of staffs, as none are used or required. The time required to furnish a bloom being only about six seconds, the scoria has no time to set, consequently is got rid of much easier than when allowed to congeal as under the hammer. The iron being discharged from the machine so hot, rolls better and is much easier on the rollers and machinery. The bars roll sounder, and are much better finished. The subscriber feels confident that persons who will examine for themselves the machinery in operation, will find it possesses more advantages than have been enumerated. For further particulars address the subscriber at Troy, N. Y. P. A. BURDEN.

Railroad Spikes and Wrought Iron Fastenings.

THE TROY IRON AND NAIL FACTORY, exclusive owner of all Henry Burden's Patented Machinery for making Spikes, have facilities for manufacturing large quantities upon short notice, and of a quality unsurpassed.

Wrought Iron Chairs, Clamps, Keys and Bolts for Railroad fastenings, also made to order. A full assortment of Ship and Boat Spikes always on hand.

All orders addressed to the Agent at the Factory will receive immediate attention.

P. A. BURDEN, Agent,
Troy Iron and Nail Factory, Troy, N. Y.

RAILROAD WHEELS.

CHILLED RAILROAD WHEELS.—THE UNDERSIGNED are now prepared to manufacture their Improved Corrugated Car Wheels, or Wheels with any form of spokes or discs, by a new process which prevents all strain on the metal, such as is produced in all other chilled wheels, by the manner of casting and cooling. By this new method of manufacture, the hubs of all kinds of wheels may be made whole—that is, without dividing them into sections—thus rendering the expense of banding unnecessary; and the wheels subjected to this process will be much stronger than those of the same size and weight, when made in the ordinary way.

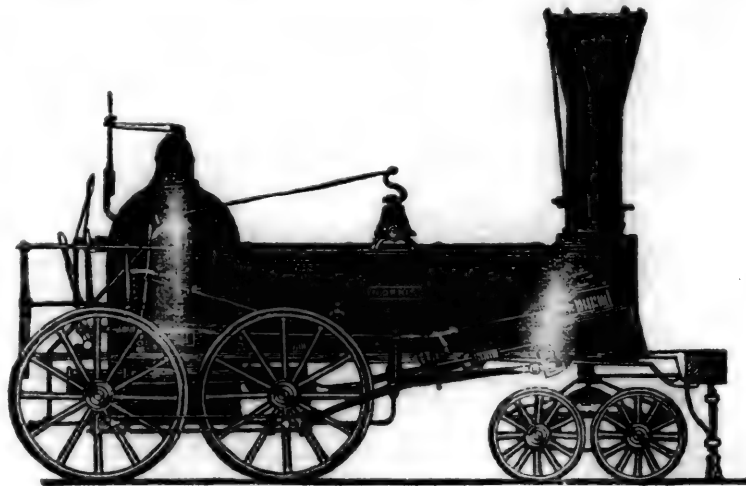
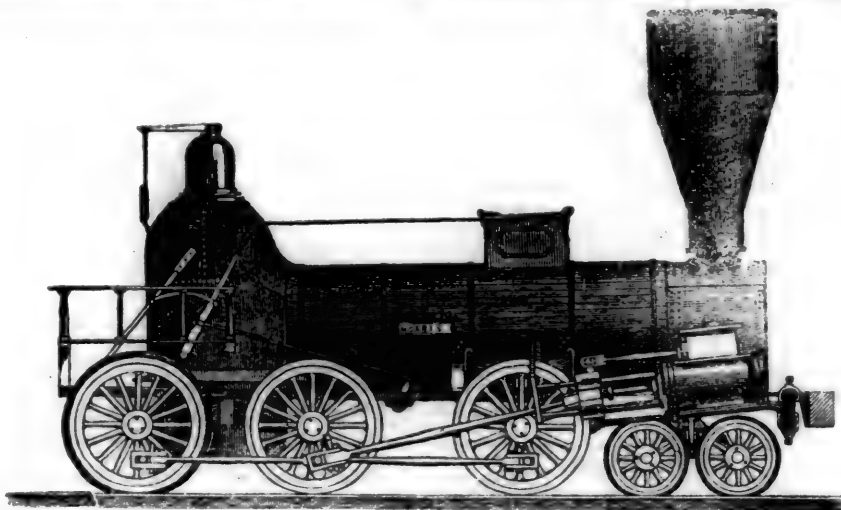
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Willow St., below 13th,
Philadelphia, Pa.

CHILLED RAILROAD WHEELS.—THE UNDERSIGNED, the Original Inventor of the Plate Wheel with solid hub, is prepared to execute all orders for the same, promptly and faithfully, and solicits a share of the patronage for those kind of wheels which are now so much preferred, and which he originally produced after a large expenditure of time and money.

A. TIERS,
Point Pleasant Foundry.

He also offers to furnish Rolling Mill Castings, and other Mill Gearing, with promptness, having, he believes, the largest stock of such patterns to be found in the country.

Kensington, Philadelphia Co.,
March 12, 1848.

NORRIS' LOCOMOTIVE WORKS.
BUSHHILL, SCHUYLKILL SIXTH-ST., PHILADELPHIA,

THE UNDERSIGNED Manufacture to order Locomotive Steam Engines of any plan or size. Their shops being enlarged, and their arrangements considerably extended to facilitate the speedy execution of work in this branch, they can offer to Railway Companies unusual advantages for prompt delivery of Machinery of superior workmanship and finish.

Connected with the Locomotive business, they are also prepared to furnish, at short notice, Chilled Wheels for Cars of superior quality.

Wrought Iron Tyres made of any required size—the exact diameter of the Wheel Centre, being given, the Tyres are made to fit on same without the necessity of turning out inside.

Iron and Brass castings, Axles, etc., fitted up complete with Trucks or otherwise.

NORRIS, BROTHERS

LAWRENCE'S ROSENDALE HYDRAULIC Cement. This Cement is warranted equal to any manufactured in this country, and has been pronounced superior to Francis' "Roman." Its value for Aqueducts, Locks, Bridges, Flooms, and all Masonry exposed to dampness, is well known, as it sets immediately under water, and increases in solidity for years. For sale in lots to suit purchasers, in tight papered barrels, by

JOHN W. LAWRENCE,
142 Front-street, New York.

Orders for the above will be received and promptly attended to at this office. 32 ly.

PATENT MACHINE MADE HORSE-SHOES.

The Troy Iron and Nail Factory have always on hand a general assortment of Horse Shoes, made from Refined American Iron.

Four sizes being made, it will be well for those ordering to remember that the size of the shoe increases as the numbers—No. 1 being the smallest.

P. A. BURDEN, Agent,
Troy Iron and Nail Factory, Troy, N. Y.

COLUMBUS, OHIO,
Railroad Car Manufactory.
RIDGWAYS & KIMBALL,

HAVE established at this central point, the manufacture of Passenger, Freight, Gravel and Hand Cars for Railroads, and assure all Western Railroad Companies that it will be their constant aim to procure the best materials and workmen, and to turn out the best kind of work at fair prices. Specimens may be seen on the Columbus and Xenia Railroad. The patronage of Railroad Companies is respectfully solicited. 1y8

To Inventors and Patentees.

OWEN G. WARREN, ARCHITECT, Has had many years' experience as Agent for obtaining Patents, both in this country and Europe, and will transact such business promptly and reasonably. Persons at a distance can have their business done by correspondence—without the necessity of visiting this city or Washington. Office No. 94 Merchants Exchange, Wall st., corner of Hanover st., up stairs. 1y3

AMERICAN RAILROAD JOURNAL.

STEAM NAVIGATION, COMMERCE, MINING, MANUFACTURES.

HENRY V. POOR, Editor.

ESTABLISHED 1831.

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M. BUTT HEWSON, C. E., *For Civil Engineering.*

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American Railroad Journal.

PUBLISHED BY J. H. SCHULTZ & Co., 136 NASSAU ST.

Saturday, April 13, 1850.

Forges and Iron Mines of Northern New York.

In the description of the Iron ores of the Lake Champlain district of New York State, commencing on page 544 of the last volume of the Railroad Journal, an account of the forges and the mines connected with them, of Clinton and Essex counties, was deferred until more data were obtained than those then at hand. Being now provided with enough* at least to give a tolerably complete view of the extent and character of the business in Clinton county and the northern part of Essex, including by far the greater part of the forges of the whole district, I have thought it as well not to defer the publication merely for the sake of including in it the names of the few forges in the southern and central parts of Essex county, with which I am not furnished.

For a long time this region has been celebrated for its great production of bar iron of excellent quality, particularly for the manufacture of nails, and of a variety of articles made from it. Its products have commanded a ready sale in New York and throughout New England, and are still in demand even on the remote shores of the western lakes. The abundant iron mines of the region,

* For these data I am principally indebted to the politeness of Gen. Skinner, Col. C. D. Barton and Hon. James Rogers.

and its extensive forest of excellent hard wood, together with the great facilities afforded for the establishment of small forges for the immediate conversion of its ores into malleable iron by the frequent falls of its numerous streams, have, in spite of the sterility of its soil and the severity of its climate, led to its becoming populated with a hardy and industrious people. For an extent of some 70 miles north and south by 35 in width, they are planted along the valleys of the streams in the vicinity of the mines. On the streams stand their forges and near by the prosperous towns, which have grown up from these beginnings. In front this region lies open to the lake on the east; behind it is bounded by the dreary waste of the Adirondac mountains, from the flanks of which its streams descend, and around which the Ausable alone has wound its way.

The general character of the ores and their geological position have already received some attention. They occur in veins,* inexhaustible in their nature, in the granite and gneiss rocks, and most frequently near the line of contact of the great formation of these rocks, which occupies the central mass of northern New York, with the lowest stratified rocks.

The Potsdam sandstone, which is the lowest member of the group of sedimentary rocks of New York, occupies a belt of country between the granite and the lake, the line of contact approaching the lake at Port Kent, and gradually passing from it towards the North. Up the Ausable the granite rocks are met with from six to eight miles from its mouth, and on the Saranac their distance from the lake at Plattsburg is no less than seventeen miles. It is on these streams and the Salmon river and the Little Ausable, all of which flow parallel to each other from the elevated granitic tract down to the lake, that the principal forges are established. The ores are obtained from the hills bordering these streams, and their branches.

* See on this subject my remarks on page 527 of the preceding volume of this Journal. The exact nature of these deposits is somewhat obscure. Professor Emmons, in the State Geological Report, p. 291, states decidedly "they are all distinctly veins;" and again on p. 301 of same report—"though I have spoken of this (Palmer mine) and many other instances of the mineral existing as an ordinary vein, yet the word has been adopted partly from convenience; for neither the term *vein* nor *bed* appears to express the true relation to the rock."

The veins tend generally to a north and south direction, and for the most part they are included between the planes of stratification of the gneiss, or what seem to correspond to these in the granite.—The ore is frequently scattered through the rocks in considerable quantity, particularly near the veins; but even at places remote from these it is found sufficient to strongly effect the magnetic needle. Several veins often occur nearly parallel to each other within a width of a few rods. Their dip is steep, but not the same in all the veins.

In following them they are sometimes found to dip in the direction of their course, the upper line of the ore passing beneath a *cap* of the granitic rock. I believe it is generally the case that the body of the vein is thus capped over, rarely appearing at the surface even though the rock which contains the vein beneath the surface is exposed to view. The veins are cut by dykes of greenstone, which cross them obliquely, sometimes heaving them slightly out of place. Few minerals accompany these iron ores. The common gangue is quartz or flint, from which the pure ore is separated by crushing and washing. It is rare to find the ore in the veins so pure as not to need this preparation for the forge. The Port Henry Cheever ore, the New Bed ore of the same vicinity, and the ore from the deep workings of the Arnold mine near Clintonville, are the only exceptions that I am aware of. The little quartz still adhering to the ore after the separating process is of no small service in facilitating as a flux, the reduction. The width of the vein is sometimes very great, even reaching thirty-five feet. These larger deposits are worked along their course open to the day, and the excavations form large chasms, which collect all the water flowing above them. At some of the mines serious difficulties have been met with in draining, as well as heavy losses from falling in of the walls occasioned by the injudicious mode of mining. The ores are combinations in various proportions of the two oxides of iron. The per oxide in some of them prevails to such an extent as to give its characteristic reddish color and powder to the mass, which then has but feeble magnetic action.

The reducing process is wholly conducted in forges similar to the Catalan forge. A particular description and plan of these will be given in the course of this article. It is probable that the small

Penfield's mine, a distance of four miles—transportation 87½ cents per ton.

1 Forge of 4 fires four miles farther up Schroon river in North Hudson, owned by Taber C. Imus, Esq.

1 Forge of 2 fires at Schroon River Falls, two miles above Paradox lake. The ores for this forge are hauled—a part 5 miles, and the rest 8 miles.

In Keenie and Jay, back in the interior on the head waters of the Ausable are several other establishments of this kind.

A large number of fires besides those in the table are thus added to that list. We may safely reckon 50 at least, and I think it not at all unlikely if the whole number were known it would be found to exceed 200—capable of making no less than 300,000 lbs. of iron a day or about 45,000 tons per annum. H.

On the Construction of Roads.

Continued from page 212.

GRADING.

The importance of elevating a road bed above the level of the adjoining fields, and digging deep ditches on each side, has been already urged, (pp. 53, 54,) and this is a fundamental requisite in making a good plank road. Employ the earth from the ditches, if good material, rejecting the sods, to raise the road bed. Give the ditches free outlets, cut their bottoms with true slopes, make under drains, of cobble stones and brush, across the road in wet places, and use every precaution to ensure thorough and complete drainage. This will be more difficult in a flat than in a hilly country. If it be effected, however, the plank will last much longer, and the road be always in better condition.*


The "cross-section" of the road bed, or its shape crosswise, between the ditches, must be carefully adjusted so as to freely carry off the rain which may fall on it. First decide on which side of the road the plank track is to be laid. It should generally be on the right hand side coming from the country into a town, so that the farmer's wagons may keep upon it when they bring in their heavy produce, and that the turning out may be done by those which are going back light.† The twelve feet width intended for the earth track should be heavily rolled or beaten, to make it firm and hard. It should slope down from the centre three-quarters of an inch to the foot, (1 in 16,) and the eight feet of plank should fall off three inches, or 1 in 32. From each side of the 20 feet thus graded, the bank should slope down to the bottom of the ditches at the rate of three inches to the foot, or 1 in 4.

The proper shape may be most easily and accurately given by the use of a common mason's level, having a tapering piece of wood under it, or having one leg so much longer than the other, as will give the slope required. If the plank be laid on an old road way, no more of it should be broken up than is absolutely necessary for imbedding the sleepers, as it is very desirable to preserve as solid a foundation as possible.

SLEEPERS, SILLS, OR STRINGERS.

Material.—Pine, hemlock, tamarack, oak, and walnut have been used in Canada. Hemlock has been mostly used in New York, from its abundance and cheapness. Pine would be more durable.

Number and size.—At first, five or six, each six inches square, were placed under 16 feet plank—

* The ditches and side slopes of the road bed, after being ploughed up, may be most rapidly shaped by the use of a scraper of this form,  composed of two planks hinged together in front, and kept apart in the rear by an adjustable cross-piece. The team is attached to the outer plank at such a distance from the point as to keep the inner plank in the direction of the road, so that it forms the straight edge of the bank, while the skew of the outer plank throws the earth to one side in the manner of a snow plough. A man with a long lever inserted in the outer side regulates this more exactly.

† But, in ascending a long hill in either direction, it should be on the right hand side.

The Canada board of works' specification, 1845, directs four to be put under a 16-foot road, and 3 under a 10-foot road; the outer ones to be 5 inches square, and the inner ones to be six inches wide, and two inches thick, laid flatwise. On the New York roads of eight feet planks, two sleepers, four inches square, have been generally employed.—They have, however, been found insufficient, and the experienced engineer of the original Syracuse road, strongly recommends sleepers 12 by 3, laid on their flat sides, and for an important road would make them 12 by 4, or even 12 by 6*. They should be large and strong enough to hold up the plank road in case of a soft place for a few feet. Others argue, however, that they should be small enough to sink down with the earth as it settles under the planks, so that these may continue to bear upon the ground; as otherwise the planks would be rapidly worn out by the springing thus caused, and would be soon rotted by the confined air under them. They also assert that the only use of the sleepers is to keep the road in shape when first laid down. Indeed, a road three miles long has been laid in Canada, without any sleepers at all under the planks, and it worked quite well. Its advocates say that sleepers form a trench in which water collects, and is by them prevented from running off. It therefore floats the planks, or washes out mud from under them, and thus forms a cavity, which produces the bad effects above mentioned. This consideration would make light sleepers appear to be worse than none. The conclusion seems to be that large sleepers should be used for an important road; and that for a poor one, which expects to receive only light loads, and which runs over a hard bottom, sleepers might perhaps be altogether dispensed with.

Length.—The sleepers used should be as straight and true as possible. On the Syracuse road none less than 13 feet long were admitted. On the Canada roads they are required to be not less than 16 feet, nor more than 20 feet long.

Laying.—Their distance apart, centre to centre, should be such that the wheels of loaded wagons may pass directly over their middle; or somewhat nearer to their outer than their inner sides. This distance will therefore vary in different sections of the country, according to the usual "track" of wagons.† If this principle be varied from, it should be by bringing the sleepers nearer the middle than the ends of the planks, to prevent any depression in the centre. The foot wide sleepers in the figure are drawn three feet apart in the clear, or four feet centre to centre.

They should be well bedded in the earth, in trenches cut to receive them, with their top surface barely in sight. They should bear firmly and evenly throughout their whole length, and the earth between them be well rammed down, and made firm, solid, and even.‡ The sleeper nearer the ditch is to be laid so much lower than the inner one, as to give the proper slope to the road, which is so important for carrying off the rainwater.

Joints.—At the joints, where two sleepers come together, end to end, they are liable to sink under passing loads. To prevent this, various means may be employed. The broad sleepers (12 by 3) may be sawn in two lengthwise, so as to be each 6 by 3, and laid side by side, so as to "break joints"; the joints of one set being opposite the middle of the adjoining pieces with which is formed the other set. The sawmills charge no more for the sleepers in two pieces, each 6 by 3, than in one 12 by 3. A second remedy is to lay a short board under the joints of the sleepers. A third is to connect the

* The lower sleeper may be 14 inches wide, and the other 10, as the former acts as a bridge over the channels made under it to let off the water.

† The common track of wagons, measured "from inside to outside" which is the same as from centre to centre, is four feet eight inches in the state of New York. In New Jersey and the Southern States, it is five feet. In Connecticut it varies from three feet eight inches for light wagons, to five feet two inches for heavy ones. In Wisconsin, it is five feet four inches.

‡ A wooden roller, weighing two tons, has been very successfully used for settling the sleepers and the earth between them, being drawn over them several times before they are planked.

ends by a mortise and tenon two inches long. A fourth is to unite them by a bevel scarfing, three inches in length, these to be reversed on each half, in which, for distinctness, the two sleepers are represented as separated. In every case the joint on one side of the road ought to be opposite the middle of the sleeper on the other side.

PLANK.

Material.—In Canada, pine, hemlock, tamarack, oak, and Walnut, have been employed. In this state, hemlock alone has been used, being the cheapest material to be obtained. Its defects are its perishable nature, and its numerous knots, which soon make the road rough, when the softer portions of the planks have worn away. Pine, oak, maple, or beach would be preferable. In Wisconsin, &c., white and burr oak are abundant, and would therefore be advantageously used. Oak would make the most permanent road from its superior capabilities of resisting both wear and decay. From its greater weight it would cost a little more for hauling and handling. The slipperiness of hardwood has been made an objection to it, but the sand with which the road should be covered, would obviate this. Whatever sort of timber is employed, it should be sound and free from sap, bad knots, shakes, wanes, or any other imperfections. The plank should be full on the edges, and not less than nine nor more than sixteen inches wide, if of soft wood, or not more than twelve, if of hard wood.

Thickness.—The planks are usually either three or four inches thick; but the builders of the latter roads prefer giving less strength to the plank, and more to the sleepers, which are more durable; and therefore recommend three-inch plank, with sleepers a foot wide. With hemlock plank, any thickness beyond three inches is wasted, for when two inches have been worn down, the projecting knots will make the road too rough to travel on, and it will require renewal. One inch more will be sufficient to hold the knots in, so that we get three inches as the proper thickness. With less knotty timber, thicker plank may be used, provided there will be travel enough to wear out the whole thickness from above, before it unprofitably rots out from below. When two tracks are laid, that which would be travelled by the loaded wagons going to market may be laid with four-inch plank, and the other track, for the light wagons, with three-inch plank.

Laying.—The planks should be laid directly across the road, at right angles, or "square," to its line, as shown in fig. 115, b, on page 230. The ends of the planks are not laid evenly to a line, but project three or four inches on each side alternately, so as to prevent a rut being formed by the side of the plank track, and to make it easier for loaded wagons to get upon it: as the wheels, instead of scraping along the ends of the planks, when coming towards the track obliquely after turning off, will, on coming square against the edge of one of these projecting planks, rise directly upon it. On the Canada roads, every three planks project three inches on each side of the road alternately, as shown in fig. 115, b.

The planks were laid lengthwise of the road, on the first one running from Quebec, it being supposed that they would wear better, and could be more easily taken up and replaced. But it was found that loaded horses slipped upon them, (the longitudinal direction of the grain giving no hold to the feet,) that ruts were soon worn in them, and that they did not keep their places. This arrangement is therefore now abandoned.

The planks have also been laid obliquely, diagonally, or "skewing," so as to make an angle of 45 degrees with the line of the road, twelve feet plank making an eight feet wide road. This plan is adopted on the Longueuil and Chambly road near Montreal. Its advantages are, that the edges of the plank are not worn down so soon as when the wheels strike them directly, (as shown in reference to pavements, on page 222;) that the zigzag ends of the plank facilitate the getting on the track; and that there is less loss on the rejected, or "cull" planks of 12 feet, than those of 8 feet. But when a wagon wheel comes upon one end of a plank laid thus obliquely, the other end, having no load to keep it down, will spring up, if not fastened to the sleeper; and if it is, the spikes or pins will finally be loosened. Each end of each plank undergoes

this action in turn, and thus the road is injured and broken up. The first method of laying the planks—at right angles to the direction of the road—is much to be preferred.

The planks must be laid so as to bear equally on the sleepers, and on the ground between them, depending chiefly on the latter for support. The earth must be well up to and touching the planks at every point, for if any space of confined air be left, dry rot soon follows. If any water be allowed to get under the planks, it forms a soft mud, which is pressed up between them, and deposited on their surface, thus excavating a cavity under them, and rendering them liable to move under passing loads, in a manner which soon wears them out. They must also be laid to close joints.

Fastening.—On the Canada roads the planks have generally been spiked or pinned down to the sleepers. The specification of the board of public works directs them to be spiked "with one spike at each end for planks 12 inches wide or less, and two at each end for planks of a greater width. The spikes are to be of a description called 'pressed' spikes, made of the best English or Canadian iron. They are to be 6½ inches long, 3-8 inch square with chisel-shaped edges, and good broad heads, and are to weigh five to a pound. They are to be driven with the chisel-edge across the fibres of the wood."

On the New York roads this has been considered an unnecessary expense, since the loads come equally upon both ends of the transverse planks, and thus tend to keep them down in their places, their own weight assisting in this. But in wet and badly drained places a new consideration intervenes. If the planks are not fastened down, they will float as soon as an inch of water gets under them. The wheels of a loaded wagon pressing down each plank in turn, drive the water before them, till it finally attains force enough to throw up a plank, and thus break up the road. On the other hand, when the planks are fastened down, the whole road is floated, and the vibrations produced by the passing loads drive the water out on the sides and top of the road, and excavate cavities, which ought to be immediately filled up, an operation which is made difficult by the fastening down of the planks to the sleepers. It is therefore thought better to leave the plank free, and allow them to be thrown out of place, and thus at once give free passage to the water, and prevent further mischief; a repairer being kept constantly at work upon the road, and required in rainy weather to pass over it once or twice a day. It might be well, as a compromise, to spike down planks at short intervals, say every fifth or tenth plank, the rest being well driven home against these.

Covering.—The planks having been properly laid, as has been directed, should be covered over one inch in thickness, with very fine gravel, or coarse sand, from which all stones or pebbles are to be raked, so as to leave nothing upon the surface of the road, that could be forced into and injure the fibres of the planks. The grit of the sand soon penetrates into the grain of the wood, and combines with the fibres, and the droppings upon the road, to form a hard and tough covering, like felt, which greatly protects the wood from the wheels and horses' shoes. Sawdust and tan bark have also been used.

The road is now ready for use.

To be continued.

New York.

Eric Railroad.—The receipts of the Eric railroad for the month of March, 1850, were:

From passengers and mail.....	\$55,349 88
" freight.....	75,218 80

Total.....	\$130,578 68
The receipts in March, 1849, were.....	50,073 07

Increase [260 per] cent..... \$80,505 61

Northern Railroad.—This work is progressing rapidly toward Ogdensburg. By the first of May the locomotive will be in operation to the village of Chateaugay, 45 miles from Lake Champlain. This will be good news to fishermen, who have been hitherto able to reach the trout streams of those regions, only after excessive fatigue.

Pacific Railroad.

Convention at Philadelphia.

This convention met on the 1st inst., and was finally organized by the choice of William B. Ogden, Esq., of Illinois as president.

VICE PRESIDENTS.

Pennsylvania—Edward C. Hubley.
 Delaware—C. J. Dupont, Judge Harrington.
 New Jersey—Benjamin W. Cooper.
 Virginia—Hall Neilson.
 Ohio—J. H. Godman.
 Illinois—H. K. Strong.
 Iowa—Hon. G. W. Jones.
 Missouri—J. Bowlen.
 New York—C. Colton.
 Michigan—J. Biddle.
 Rhode Island—Van Rensselaer Stevens.
 Massachusetts—P. P. F. Degrand.
 Arkansas—J. H. Storman.
 Indiana—Hon. John L. Robinson.
 Texas—W. R. Ochiltree.

SECRETARIES.

Pennsylvania—Thomas Birch, Jr.
 Missouri—A. B. Chambers.
 New Jersey—Philip J. Gray.
 Delaware—Dr. J. W. Thomson.

On motion it was resolved, that each state be entitled to the same vote, as her congressional representation.

Mr. A. B. Chamber, of Missouri, as one of the secretaries of the St. Louis convention, laid before the convention a series of resolutions adopted by that body at its last meeting. At his request they were read, and referred to the committee on resolutions. They are as follows:

Resolved, That in the opinion of this convention, it is the duty of the general government to provide, at an early period, for the construction of a central national railroad from the valley of the Mississippi to the Pacific ocean.

Resolved, That in the opinion of the convention, a grand trunk railroad, with branches to St. Louis, Memphis and Chicago, would be such a central and national one.

Resolved, That a committee be appointed to communicate to a convention to be held in Memphis, the foregoing resolutions, and to request a concurrence of said convention therein.

At another stage of the proceedings, the following resolutions were offered by the Hon. S. Treat, and unanimously adopted.

Resolved, That as an important means, as necessary and preliminary to the construction of such railroad, it is the first duty of the American Congress, immediately on its assembling together, to make provision for the establishment of military posts from the western confines of the Western States to the Pacific ocean; that these posts should be established numerously in all proper places, not far distant from each other, and that civilized and productive settlements should be encouraged around them by liberal sales or grants of public lands, and by ample protection to the settlers.

Resolved, That the Congress of the United States be memorialized to construct, or authorize the construction of a national line of telegraph along the line which may be determined upon by national authority for the great railway to the Pacific. Said line of telegraph to be constructed in connexion with the military posts named in the preceding resolution, and to be pushed to completion as early as practicable.

The convention was then addressed by Mr. Degrand of Boston, in favor of his plan, with which our readers are familiar.

Mr. Degrand spoke at much length concerning the greatness of the enterprise, and the absorbing influences connected with it. He was listened to with much interest, and concluded by moving that the pamphlet he held in his hand, containing the proceedings of a railroad convention at Boston, should be referred to the committee on resolutions: The motion was passed.

Mr. T. B. Florence then presented and read the

following preamble and resolutions, which he moved to refer to the committee on resolutions:

Resolved, That we believe a railroad from the States to the Pacific to be practicable, and ultimately calculated to be of immense benefit to the United States and to its citizens; that with these convictions we recommend an early survey of the entire line by the general government, and that its final construction and control be confided to sworn commissioners selected by the state legislatures, or elected by the people of the various States, whose equitable distribution of the benefits and patronage of the work among the citizens and laborers of the whole country, may prevent it from becoming a political engine or a speculating monster.

Resolved, That we further recommend that the said railroad may commence at some point on the line of the Missouri river, and from thence to run westward to the Pacific, over territories under the jurisdiction of the general government: and that one of the earliest measures in connection with the said work, be to guard the lands of the proposed route from falling into the hands of speculators, to the future exclusion of the superior rights, of the workmen on the road.

Resolved, That the said railroad, when finished, be open to all the world, and that its revenues be kept down at the lowest rates adequate to the current expenses of attendance and repairs. In this connection we heartily recommend the national project, (embracing and enforcing the above views) to the favorable consideration and report of the committees of Congress, to whose preliminary examination it now stands referred, and subsequently to the favorable action of the two branches of the national legislature, to whom the reports of those committees must be made.

The preamble and resolutions were referred in accordance with the motion.

Mr. Van Rensselaer Stevens, of Rhode Island, presented a paper, which according to his wish was read. It emanated from a railroad convention held in March last at Providence, R. I., and proposed a plan for a railroad to the Pacific, different from others.

On motion of Mr. Stevens, the paper was referred to the committee on resolutions.

The Chair announced the committee on resolutions to be composed of the following gentlemen:

Samuel R. Curtis, of Iowa; Hon. J. B. Bowlin, Miss.; H. K. Strong, Jr., Ill.; John Biddle, Mich.; David C. Wilson, Del.; Jas. H. Godman, O.; J. F. Johnson, Va.; Josh. Buffum, R. I.; Alfred Wallace, Ark.; John A. Roebling, N. J.; Asa Whitney, N. Y.; C. T. Laport, Mass.; W. B. Ochiltree, Texas; Thomas M. Pettit, Pa.

After some other unimportant proceedings Mr. Curtis, of Ohio, as chairman of the committee on resolutions, reported a series of resolutions, which had been agreed upon. The committee had not adopted any of the plans submitted to them, and indeed, had not had time to properly consider them. They had, therefore, adopted general resolutions, which he read, as follows:

Resolved, That in the opinion of this convention, a railroad communication connecting the navigable waters of the Mississippi with the navigable waters of the Pacific Ocean, is practicable, and its construction is desired immediately. It is, therefore, the duty of Congress in some way to apply the energies of our country, so as to secure the earliest possible completion of such a work.

Resolved, That the work is national in its character, and should, therefore, be constructed by national means; but to avoid state and local prejudices, the government should confine its operations to the country beyond the limits of the organized States, leaving the various branches within the States to be constructed by such means and on such routes as the States may prefer.

Resolved, That to aid the States in carrying forward their lines to the main trunk, liberal appropriations should be made of the public lands adjacent, to be applied as the States may consider expedient.

Resolved, That Congress be memorialized to take such steps, as in its wisdom may be deemed expedient to accomplish the great object contemplated in the foregoing resolutions—commencing with a thorough survey, by competent engineers, of all the routes that may be considered practicable.

S. V. Merrick, Esq., moved that they be adopted.—This elicited a discussion in which a number of gentlemen participated. Mr. C. T. Laporte, of Massachusetts spoke in opposition to them, and advocated the plan of Mr. Degrand. Mr. Carter, of Ohio, spoke in opposition to Mr. Degrand's plan, and also in opposition to that of Mr. Whitney. The first made the government pay an enormous disproportion of the cost, and the latter was simply impossible. Mr. Whitney could not, by any means obtain the strip of land which is essential to his plan. He wished the concentrated action of Congress to be brought upon the subject. He was desirous to avoid all sectional jealousies.

Mr. V. R. Stevens, of Rhode Island addressed the convention in favor of the "Rhode Island" plan, which has been published in the columns of our paper. He claimed in favor of his plan that it gives a national location, and gives the stamp of nationality as fully to the whole work as does Mr. Benton's.

It presents a compromise between Mr. Benton's and Mr. Degrand's, and combines the best features of both.

It shuns the great objection of indefinitely extending political patronage.

It reduces nearly half of the government expenditures, and combines both the power of the government and that of an efficient, powerful company.

It insures the continued exertion and early completion of the work; for government cannot stop the work without great damage to the company—nor can the company stop without a corresponding damage to the government.

It holds on to the public lands until, by the progressive advancement of the road, they can be sold at their advanced value.

It invites foreign capital to this country by presenting a prominent and profitable place for investment.

It provides for a transfer of the government part of the road without the expenditure of money by the company—only the perpetual performance of service as government carriers; the enhanced value of the lands being the profit to the government.

Government can afford to build a southern and northern route.

This plan divides the project where a real separation is found growing out of the character of the work and the men who do it.

As regards expenses and location.:—

Whatever is plausible in Mr. Benton's plan (and there is much) is embraced in this.

This plan embraces every good feature of Mr. Degrand's—but avoids the objectionable features.

The plan is offered as a compromise—as uniting the two in one, and is commended to the good sense of every statesman.

Some of the objections to Mr. Benton's plan may be thus stated:

It involves immense extended political patronage—we are sure that Mr. Benton does not mean this, for it can never chime with his democratic principles.

It throws the whole burden upon the government.

It does not place the immediate construction of the work beyond a doubt, because his expenditures depend upon moneys from the sale of lands—so that

should a law be made giving lands to actual settlers, beside the Mexican appropriation, his means would be cut off.

These objections tell with great force against Mr. Whitney's.

Government is not, nor cannot be in a position to build the substructure, and run the road as economically as a company. It may expend its whole energies and credit on the first grand division.

As regards Mr. Degrand's plan, the following objections were urged.

It does not insure a government location; neither does Mr. Whitney's.

It establishes a dangerous precedent, by making the government creditor to a corporation.

It involves the company in a huge debt, to meet the interest of which only, apart from the principal, a high rate of toll must be charged. He proved this by a variety of demonstrative calculations.

The Rhode Island plan asks that government shall make surveys, grade the road, complete the bridging, etc. That done, a powerful company to be organized to complete the substructure, and bring the work into operation.

Mr. Joel B. Sutherland was of the opinion that government only ought to be the means by which the road should be constructed. He was utterly opposed to all private schemes. It was a government matter solely. California is a country which we cannot keep except by a road to the Pacific.

He glanced rapidly at the circumstances under which she applies for admission into the Union, and of the prospects which open before her; and we regret that we cannot sketch his remarks. He concluded by an earnest appeal in favor of the passage of the resolutions of the committee.

Mr. Solomon W. Roberts opposed the resolutions of the committee, but wished the debate postponed in order to receive a letter from Col. Fremont relative to California, which was expected next day.

He also wished to have an opportunity to make a motion inviting Mr. Whitney, who is not a delegate, to address the convention.

After some other unimportant business the convention adjourned till the next morning, when the following letter was read:

COL. FREMONT'S LETTER.

To Messrs. B. Gerhard and others, Committee, &c.

Gentlemen—It would have given me great pleasure to have been able to accept your kind invitation, and to have met the Mississippi and Pacific railroad convention, on Monday, but the remains of a Chagres fever confine me to my room, and leave me no other mode of showing my sense of your attention, and manifesting the interest I take in the great object which assembles this convention, than to contribute, so far as I can, to the mass of the information which will be laid before it. In doing this, I regret that the state of my health does not permit even the labor necessary to give the distances and barometrical elevations along the route which I shall offer for your consideration, but I have caused a skeleton map rudely sketched, to be prepared to accompany this communication, and which in exhibiting the prominent features of the country and general direction of the line, will be found sufficiently full and accurate to illustrate what I have to say.

Many lines of exploration through the wilderness country from our inhabited frontier to the Pacific ocean, have conclusively satisfied me that the region or belt of country, lying between the 38th and 39th parallels of latitude offer singular facilities and extraordinary comparative advantages for the continuation of the proposed road.

I propose, therefore, to occupy your attention solely with this line for the clearer understanding of which, it will aid to keep under the eye the accom-

panying map, upon which the unbroken red lines are intended to show that the regions which they traverse have been already explored, while the broken red lines indicate what is known only from reliable information.

The country to be traversed by the proposed road exhibits but two great features—the prairies, reaching to about the 105th degree of longitude; and the mountains with which it is bristling from that point to the shores of the Pacific ocean. Some years of travel among these mountains, during which I was occupied principally in searching for convenient passes and good lines of communication, gradually led me to comprehend their structure and to understand that among this extended mass of mountains there is nowhere to be found a great continuous range having an unbroken crest, where passes are only to be found in the comparatively small depressions of the summit line.

Throughout this great extent of country—stretching in each way about 17 degrees—all these apparently continuous ranges are composed of lengthened blocks of mountains, separate and detached—of greater or less length according to the magnitude of the chain which they compose—each one possessing its separate, noted and prominent peaks, and lying parallel to each other, but not usually so to the general direction of the range, but in many cases lying diagonally across it, springing suddenly up from the general level of the country; sometimes rising into bare and rocky summits of great height, they leave openings through the range but little above this general level, and by which they can be passed without climbing a mountain. Generally these openings are wooded vallies, where the mountain springs from either side collect together, forming often the main branches of some mighty stream. Aggregated together in this way, they go on to form the great chains of the Rocky Mountains and Sierra Nevada, as well as the smaller and secondary ranges which occupy the intervening space. With the gradual discovery of this system, I became satisfied, not only of the entire practicability, but of the easy construction of a railroad across this rugged region. As this peculiarity in the country forms the basis of my information, I desire to state it clearly at the outset, in order that I might be more readily understood in proceeding to show that this continent can be crossed, from the Mississippi to the Pacific, without climbing a mountain, and on the very line which every national consideration would require to connect the great valley of the west with the Pacific ocean.

In describing the belt of country through which the road should pass, it will be found convenient to divide the entire line into three parts—the eastern reaching from the mouth of the Kansas to the head of the Del Norte; the middle from the head of the Del Norte to the rim of the Great Basin; and the western from the rim of the Great Basin to the ocean. Beginning near the 39th parallel of latitude, at the mouth of the Kansas, the road would extend along the valley of that river some three or four hundred miles, traversing a beautiful and wooded country of great fertility of soil, well adapted to settlement and cultivation. From the upper waters of the Kansas, falling easily over into the valley of the Arkansas, the road strikes that river about a hundred miles below the foot of the mountains, continuing it only to the mouth of the Huertano river. From this point the prairie plains sweep directly up to the mountains, which dominate them as highlands to the ocean. The Huertano is one of the upper branches of the Arkansas, and following the line of this stream the road would here enter a country magnificently beautiful—timbered, having many bays or vallies of great fertility;—having a mild and beautiful climate; having throughout the valley country short winters, which spend their force in the elevated regions of the mountains. The range of mountains in which this stream finds its head springs is distinguished by having its summits almost constantly enveloped in clouds of rain or snow, from which it obtains its name of Sierra Mojada, or Wet Mountain. This chain is remarkable among the Rocky Mountain ranges for the singular grandeur of its winter scenery, which has been characterised by travellers who have seen both, as unsurpassed either in the Alps or the Himalayas. Their naked rocky summits are grouped into numerous peaks,

which rise from the midst of black piney forests, whence issue many small streams to the valley below. Following by an open wagon way the valley of the Huerfano, the road reaches the immediate foot of the mountain at the entrance of a remarkable pass, almost every where surrounded by bold, rocky mountain masses. From one foot of the mountains to the other, the pass is about five miles long; a level valley from two to four hundred yards wide, the mountain rising abruptly on either side. With scarcely a distinguishable rise from the river plains, the road here passes directly through or between the mountains, emerging in the open valley of the Del Norte, here some forty or fifty miles broad, or more properly a continuation northward of the valley in which the Del Norte runs. Crossing this flat country, or opening between the mountains, and encountering no water course in its way the road would reach the entrance of a pass in the Colorado mountains, familiarly known to the New Mexicans and Indian traders who are accustomed to traverse it at all seasons of the year, and who represent it as conducting to the waters of the Colorado river though a handsome rolling grass-covered country, and affording practicable wagon routes.

This section of the route, so far as the entrance to this pass, covering twelve degrees of longitude, I am able to speak of from actual exploration, and to say that the line described is not only practicable, but affords many and singular facilities for the construction of a railway, and offers many advantages in the fertile and wooded country through which it lies in the greater part of its course.

In the whole distance there is not an elevation, worthy of the name, to be surmounted; and a level, of about 8000 feet, is gained almost without perceptible ascent. Up the Kansas and Huerfano river valleys, it is wooded and watered; the valley of the Del Norte is open, but wood is abundant in the neighboring mountains, and land fit for cultivation is found almost continuously along the water courses, from the mouth of Kansas to the head of the valley of the Del Norte.

A journey, undertaken in the winter of 1848-49, (and interrupted here by entering more to the southward, the rugged mountain of St. John's, one of the most impracticable on the continent,) was intended to make a correct examination of this pass and the country beyond to the rim of the Great Basin. The failure of this expedition, leaves only for this middle portion of our line such knowledge as we have been able to obtain from trappers and Indian traders. The information thus obtained had led me to attempt its exploration, as all accounts concurred in representing it practicable for a road;—and the information thus obtained was considered to be sufficiently reliable.

According to this information, the same structure of the country to which I have called your attention above, as forming a system among the mountains, holds good; and I accordingly found no difficulty in believing that the road would readily avoid any obstacles which might be presented in the shape of mountain ranges, and easily reach the Basin.

In pronouncing upon the practicability of a road through this section, I proceed upon my general knowledge of the face of the country, upon information received from hunters and residents in New Mexico, and upon the established fact, that it has not only been travelled, but at all seasons of the year, and is one of the travelling routes from New Mexico to California.

The third section of the map is from the Wahsatch Mountain to the Sierra Nevada, and thence to the Bay of San Francisco. This route traverses the Great Basin, presenting three different lines, which you will find indicated on the map. Repeated journeys have given me more or less knowledge of the country along these lines, and I consider all of them practicable, although the question of preference remains to be settled. The northern line is that of the Humboldt river, which, although deflecting from the direct course of the bay, commands in its approach to the mountains several practicable passes, the lowest of which is only 4500 feet above the sea.

The southern line, which in crossing the Basin, has not the same freedom from obstruction enjoyed by the open river line of the north, is still entirely

practicable, and possesses the advantage of crossing the Sierra Nevada at a remarkably low depression, called Walker's Pass, more commonly known as the *Point of the Mountains*, and being in fact a termination of one of the mountains which go from that chain.

This pass is near the 85th degree of latitude and near the head of the beautiful and fertile valley of the San Joaquin, which the road thence would follow down to its junction with the Sacramento or to some point on the bay. This route deflects to the south about as much as the other does to the north, but secures a good way, and finds no obstacle from the Sierra, turning that mountain where it has sunk down nearly to the level of the country. Among the recent proceedings of the California Legislature, resolutions were introduced in favor of bringing in the railway at this pass.

The third line, which is the middle and direct line, and that to which I gave a decided preference, is less known to me than either of the others, but I believe fully in its practicability, and only see, as the principal obstacle to be overcome, the Great Sierra itself, which it would strike near its centre. That obstacle is not considered insurmountable, nor, in the present state of railway science, sufficient to turn us from the direct route. A pass is known as indicated by the line upon the map, which labor would render practicable. Other passes are also known, to the north and south; and if tunnelling become necessary, the structure of the mountains is such as allow tunnels to be used with the greatest advantage. Narrow places are presented where opposite gorges approach each other, and a wall of some two or three thousand feet often separates points which may not be more than a quarter or half a mile apart at its base. It will also be remembered that the Great Basin, east of the Sierra Nevada, has a general elevation of over four thousand feet, so that the mountain would be approached on the east at that elevation, and on the west the slope is wide, though descending to near the level of tide water.

The foregoing remarks embody all the general information I am now able to give upon this line. The first section of it, from the Missouri frontier to the head of the Del Norte, is explored, and needs no further reconnaissance. It is ready for the location of the road by a practical engineer. The second and third sections require further explorations, to determine not upon practicability, but upon the preference due to one over the others.

A party of 300 men, skilfully directed, with the assistance of three or four practical road engineers, would be sufficient to lay out the whole routes, and clear and open a common road in the course of the next spring and summer, so as to be passable for wagons and carriages, and as rapidly traversed as any of the common roads in the U. States.

The obstacles which I have not mentioned are, the winter impediment of snows, and the temporary one from the hostility of Indians. The latter can be surmounted by military stations, sending out military patrols to clear and scour the line.—The snows are less formidable than would be supposed from the great elevation of the central part of the route.

They are dry and therefore more readily passed through, are thin in the valleys, and remain on them only during a very brief winter. The winter of my last expedition was one of unprecedentedly deep and early snows, yet in the valley of the Kansas and Arkansas, it was thin; in the valley of Huerfano, none; and in the valley of the Del Norte at the end of November, but a few inches deep.—Even in this severe winter, on the 5th of December, at the greatest elevation crossed by the eastern section of the line—being in the narrow pass between the Arkansas and Del Norte, the snow was only three feet deep; the thermometer at Zero near mid-day. The weather in these high mountains and deep valleys is of a character adapted to such localities—extremely cold on the mountains, while temperate in the valleys. I have seen it storming for days together on the mountains in a way to be destructive to all animal life exposed to it, while in the valley there would be pleasant sunshine, and the animals feeding on nutritious grass. Beyond the Rocky Mountains, the cold is less, and the snows become a less and more transient obstacle.

These are my views of a route for the road or

roads, (a common one is first wanted,) from the Mississippi to the Pacific. It fulfils, in my opinion, all the conditions of a route for a national thoroughfare.

1st. It is direct. The course is almost a straight line, from end to end. St. Louis is between 38-39; San Francisco is about the same; and the route is between these parallels, or nearly between them the whole way.

2d. It is central to territory. It is through the territorial centre west of the Mississippi, and its prolongation to the Atlantic ocean, would be central to the states east of that river. It is also central to business and population, and unites the greatest commercial point in the valley of the Mississippi, with the greatest commercial point on the coast of the Pacific.

3d. It combines the advantages for making and preserving the road, wood, water and soil, for habitation and cultivation.

4th. It is a healthy route. No diseases of any kind upon it; and the valetudinarian might travel it in his own vehicle, on horse, or even on foot, for the mere restoration of health and recovery of spirits.

It not only fulfils all the conditions of a national route, but is preferable to any other. It is preferable to the South Pass from being near four degrees further south, more free from open plains, and free from the rising of great rivers. Its course is parallel with the rivers, there being but one (the upper Colorado) directly crossing its line. There are passes at the head of Arkansas, in the Three Parks and north of them, but none equal to this by the Rio del Norte. There is no route north of it that is comparable to it; I believe there is no practicable route south of it within the United States. The disaster which turned me south from the head of the Del Norte and sent me down the valley of that river, and to the mountains around the Upper Gila, enabled me to satisfy myself on that point. I went a middle route—a new way—between the Gila river and the wagon road through the Mexican province of Sonora, and am satisfied that no route for a road can be had on that line, except going thro' Mexico, then crossing the great Colorado of the west, near its mouth, to cross the desert to arrive at San Diego, where there is no business, and still be six hundred miles by land, and three or four hundred by water, from the bay of San Francisco, which now is, and forever must be, the great centre of commerce, wealth and power on the American coast of the Pacific ocean.

In conclusion, I have to say, that I believe in the practicability of this work, and that every national consideration requires it to be done, and to be done at once, and as a national work, by the United States.

Your obliged fellow citizen,
J. C. FREMONT.

After the letter of Mr. Fremont's was read, Mr. Whitney was invited to address the convention.—Mr. Whitney declined the invitation on the ground that his project was not before it. The discussion then turned upon the resolutions of the committee, in which Messrs. Robinson of Indiana, Sutherland Morison of Pennsylvania, Biddle of Michigan, and Curtis of Iowa, took part, and they were almost unanimously passed.

A resolution was introduced by S. W. Roberts, Esq., and unanimously passed:

That it be recommended to the American people in all parts of our common country to urge upon Congress by numerous petitions to make an early and ample appropriation for surveys of the most feasible routes for the construction of a direct railroad to California and Oregon, from the valley of the Mississippi.

Mr. Roberts advocated his resolution by a speech of some length. In the course of his remarks he said:—

Some persons may say that this convention is a failure, because it does not recommend a plan. In my opinion, it would deserve to be considered a failure if it recommended any plan. The time for that has not yet come. Let us recommend in the strongest terms an immediate survey, and let us

urge upon the people throughout the country to petition Congress to make an appropriation for the purpose. If the people of the north and the south, the east and the west, will pour in upon Congress a flood of petitions urging this object, then it will be attained. If every town and every county, of the broad west alone, would petition for a survey, it would be sure to be granted. In this way a great and tangible good would be sure to be accomplished; the first step would be taken, and it would be a step in the right direction.

This great national railroad from the Mississippi valley to the Pacific ocean, is no chimera. It is an idea that has taken fast hold of the minds of the American people. They will never cease to think of it, to talk of it and to urge it, until it is done.—The ball has been started and no man can stop it. The power of attraction between our country on the Atlantic and our country on the Pacific, is stronger than that of the needle to the pole. It is strong enough to unite them, and it will unite them, with bands of iron, which will never be broken; and by means of which the people will be able to pass across the continent, from ocean to ocean, with a speed like that of the American eagle. Steam upon the land will beat steam upon the sea, as the wind flies faster than the wave.

Our four great eastern cities have no occasion to be jealous of each other in this matter. New York is but a degree and a half north of Baltimore, and Boston is not far north of New York. The four great railroads which they are pushing westward, all come together in the state of Ohio; and the grand trunk line which Philadelphia and Pittsburg are now constructing, for a distance of five hundred and thirty-five miles, is as much a trunk line to St. Louis as it is to Chicago, and as much a trunk line to Chicago as it is to St. Louis. Let the national Pacific railroad strike the navigable waters of the Mississippi valley where it may, it will be sure to connect with the whole net work of railroads throughout the present states, and add greatly to their value.

From Portland, in Maine, to Independence, Missouri, will be seventeen hundred and fifty miles, by the railroads already constructed or undertaken by incorporated companies. From that point to the Pacific ocean, will be about two thousand miles, so that we may say, that on that route, nearly one-half of the whole line is already begun.

Mr. Godman, of Ohio, moved the following:

Resolved, That a committee of five be appointed by the President, to draft the memorial provided for by the last resolution reported by the committee on resolutions, and that they cause the same, together with the proceedings of this convention, to be presented to the Congress of the United States, through such members of that body as they may deem advisable.

The chair appointed the following gentlemen as a committee for preparing a memorial:

John Biddle, of Michigan.
S. R. Curtis, of Iowa.
Samuel V. Merrick, of Pennsylvania.
J. A. Roelbing, of New Jersey.
Joel B. Sutherland, of Pennsylvania.

Some other unimportant motions were disposed of, and the convention after listening to a very eloquent address from its President, which we hope soon to be able to publish in full, adjourned *sine die*.

Worcester Railroad Meeting.

An adjourned meeting of the stockholders of the Worcester railroad was held on Wednesday, to hear the report of the committee on the subject of free passes; and at the same time a new meeting was called, to consider the expediency of accepting the late act of the Legislature, increasing the capital stock of the corporation.

On motion of Mr. Sturgis, the act was unanimously adopted, and the Directors were authorised to issue 5000 additional shares of capital stock, made payable on the conditions specified in the act, and at such times as they shall think proper.

Peter T. Homer, Esq., from the committee on the

subject of free passes, reported the following resolutions.

Resolved, That hereafter no persons shall be permitted to pass over the road without fare, excepting its President, Superintendent and Directors, with those of their immediate household, who would otherwise travel at the expense of said President, Superintendent and Directors; employees on the business of the road; Directors of railroads in immediate connection with the Boston and Worcester railroad; also President and Superintendent of each railroad terminating in Boston.

Resolved, That the President and superintendent of the Boston and Worcester railroad, have authority to grant free passes, by having the names of each person using such pass recorded in a book, with the number of times used. Such book shall always be accessible to the stockholders, also to authorise, under their supervision, the station agent at Worcester, to grant free passes, also to be entered in a book as before stated.

After some discussion the resolutions were adopted:—

On motion of Peter T. Homer, Esq.—

Resolved, That the directors, in their annual report, be requested to give the details of the expenditures for construction account since 1844.

On motion of Frederic Emerson, Esq.—

Resolved, That the directors be authorised to delay the construction of the Framingham Branch, at their discretion.

The following is the order of time in which the several States were admitted into the Union.

1. Delaware.....	7 Dec.,	1787
2. Pennsylvania.....	12 "	"
3. New Jersey.....	18 "	"
4. Georgia.....	2 Jan.,	1788
5. Connecticut.....	9 "	"
6. Massachusetts.....	6 Feb.,	"
7. Maryland.....	28 April	"
8. South Carolina.....	23 May,	"
9. New Hampshire.....	21 June,	"
10. Virginia.....	26 "	"
11. New York.....	26 July,	"
12. North Carolina.....	20 Nov.,	1789
13. Rhode Island.....	29 May,	1790
14. Vermont.....	4 March,	1791
15. Kentucky.....	1 June,	1792
16. Tennessee.....	1 "	1796
17. Ohio.....	29 Nov.,	1802
18. Louisiana.....	8 April,	1812
19. Indiana.....	11 Dec.,	1816
20. Mississippi.....	10 "	1817
21. Illinois.....	3 "	1818
22. Alabama.....	4 "	1819
23. Maine.....	15 March,	1820
24. Missouri.....	10 Aug.,	1821
25. Arkansas.....	15 June,	1836
26. Michigan.....	30 "	1837
27. Florida.....	7 March,	1844
28. Texas.....	20 Dec.,	1845
29. Wisconsin.....	29 "	1848
30. Iowa.....	—	1849

Henry Burden's Patent.

From the Troy Budget.

From the article published in our paper some time since, giving the result of a trial between the Troy and Iron and Nail Factory against Erastus Corning, John F. Winslow and others, before the U. S. District Court of the Northern District, Judge Nelson presiding, we see by our exchanges, it has been understood that that decision overruled Mr. Burden's claim as the first and original inventor of *hook headed spikes*. The article in question was handed us by a correspondent, and we neither examined nor understood anything of the subject matter of that suit.

Being satisfied since our attention has been called to it, that our exchanges are laboring under an error as to that decision, and have cited us as the authority to that error, it is due to Mr. Burden that we should correct it. The decision of Judge Nelson in that case, so far from overruling Mr. Bur-

den's claim to that patent, fully sustains it, and vindicates his claim to it as the original inventor.

Alabama.

Alabama and Tennessee Railroad.

The subscriptions to the stock of this company now amounts to about \$1,000,000, sufficient to warrant the immediate commencement and speedy prosecution of the work. This road is to connect Selma, on the Alabama river, and Gunter's Landing, on the Tennessee, by a line about 185 miles long. It is a very important work in every point of view. It will open a direct communication between the Gulf of Mexico and the great lines of Southern railroad, and consequently with all the railroads of the country. Its direction coincides with the course of trade. It practically unites the Tennessee river with the Gulf, and penetrates the great coal and iron fields of Alabama, and a region unsurpassed in the Union for its fertility. It will be the great road of Alabama, and exert a marked influence upon the progress of that State; and we are exceedingly gratified to find its early completion a matter past doubt.

North Carolina.

The Central Railroad.—This road is not yet quite out of the woods. After the whole amount (\$1,000,000) of individual subscription was supposed to be secured, it turned out that the subscription of \$40,000 by the Petersburg railroad could not legally be made. Upon \$47,000 also, of individual subscription, the cash payment of five per cent. was not made as is required, and of course this sum could not be counted as available. These failures leave \$76,000 yet to be raised, which will be done we have no doubt, with but little delay.

This whole movement in North Carolina has been in a few hands, and what has been accomplished has been the work of a few leading men in that State. Their efforts, we regret to say, have met with but a cold response from the great mass of the people. These men, embracing, among others, Messrs. Morehead, Graham, Saunders, Graves, Carter and Loré, fully appreciated the necessity of the proposed work, to enable North Carolina to maintain a respectful relative position in the great family of the States. Nature has favored her with a fine soil, without giving her those natural advantages in navigable rivers, for the transportation of her products, which most of the States possess. Having but limited means of forwarding her products to a market, she has but little commerce, and consequently possesses no commercial centre, where, as in other States, is collected a large amount of wealth to be returned to the country, to be expended in the further development of its resources. Her leading men saw that unless she availed herself of those agents which modern science has provided, and which are so potent in the production of wealth, and which other States are eagerly subjecting to their use, she must apparently retrograde, and present a most striking and humiliating contrast to the rapid progress of her neighbors. The few who saw and felt this, have found it almost impossible to infuse the great mass with any of the spirit and conviction which they felt.—The consequence has been that with the most energetic and persevering efforts of the first men of the State, and with a greater part of it as a field for their exertions, \$1,000,000 has not yet been raised. There is not a town in New England, of 15,000 inhabitants, but would, under similar inducements, have raised an equal sum in one week. This sum however will soon be forthcoming, and when it is

obtained, North Carolina will owe a debt of gratitude to those who have been instrumental in procuring it which she can but indifferently appreciate, and which she will never repay. If these men had known the task that was before them, we will be bound to say that they never would have undertaken it, and that they will never undertake a similar job.

AMERICAN RAILROAD JOURNAL.

Saturday, April 13, 1850.

Indiana.

We have been favored, by the politeness of John Brough, Esq., President of the Madison and Indianapolis railroad, with a map of that State, on which are laid down the various railroads now in process of construction, and which are to connect with the Madison and Indianapolis either at its northern terminus, Indianapolis, or at some point along its line. This map is accompanied with a brief description of the Madison and Indianapolis railroad, and also of the roads in which this road is to be connected, the following abstract of which we give to our readers:

1. *Madison and Indianapolis Railroad*.—This road is 86 miles long, and was completed in 1847; 26 miles being laid with a light T bar, and 60 miles with a flat rail. During the past two years, 30 miles of the plate rail reaching to Edinburgh have been replaced by a T rail of 60 lbs. to the yard. The heavy rail is also provided for the remainder of the track, and is to be laid as soon as the present track begins to decay. This road under the able management of its President is doing a very large business, and pays a large dividend upon its stock. It is the pioneer railway in Indiana, and is doing essential service to the other roads now building, in giving them an example of good management, and in extending to them important pecuniary aid, which its present flourishing condition and high credit in the money market, enables it to render. It is peculiarly fortunate for a State embarking as largely in railway construction as is Indiana, that her first and leading railroad is under the direction of a person who is so fully capable of giving to those engaged in these works advice and instruction, and who possesses both the means and disposition to give to others the benefit of his own experience.

2. *Shelbyville Lateral Branch Railroad*.—This road branches from the above road at Edinburgh, 56 miles from Madison. It is laid with a plate rail, and was put into operation July 1, 1849. It is 16 miles long.

3. *Rushville Lateral Branch Railroad*.—Extends from Shelbyville in an Easterly direction to Rushville, a distance of 20 miles. It has a plate rail. This road will be completed for the cars by the 1st of August next.

4. *Knightstown and Shelbyville Railroad*.—Extends from Shelbyville to Knightstown, a distance of 27 miles. It has the plate rail, and is to be completed by the first of August or September.

5. *Columbus, Nashville and Bloomington Railroad*.—This road forms a junction with the Madison and Indianapolis at Columbus, 45 miles north of Madison, and extends from thence in a westerly direction through Nashville to Bloomington, in Monroe county, a distance of 40 miles. This company was re-organised in January last, and about \$160,000 have been subscribed to its stock, and the company has an assurance that the iron for the

road can be obtained, if the road can be fitted to receive it without incurring any debt. This road will penetrate the coal and iron region of the State. A corps of engineers are now engaged in completing a survey of the route.

6. *Martinsville Railroad*.—Connects with the Madison road three miles north of Edinburgh, and extends in a northwesterly direction to Martinsville, a distance of 29 miles. Sufficient stock has been subscribed to fit this road for the iron. It is intended to complete this road by July 1, 1851.

7. *Indianapolis and Bellefontaine Railroad*.—This road extends from Indianapolis to the Ohio State Line, a distance of 83½ miles, where it connects with the Bellefontaine and Indiana railroad, and forms one of the links in the great line of railroad now in process of construction from Philadelphia to Terre Haute, and ultimately to St. Louis. Forty-three miles of this road is now ready for the iron, which we learn has been recently purchased for that extent. The amount now subscribed to the stock of this road has reached the sum of \$400,000. The portion of the line for which the iron has been purchased is to be completed for the fall business.

8. *Indianapolis and Peru Railroad*.—Connects the former place with Peru on the Erie and Wabash Canal, by a line 76 miles long. From Indianapolis to Noblesville, the road is prepared for the iron, which has been purchased for this extent. It is to have a plate rail 2½ by 7-8 inches, and the 20 miles is to be completed for the fall trade. The Madison company is to run both of the last named roads for the present.

9. *Indianapolis and Lafayette Railroad*.—connects Indianapolis and Lafayette on the Erie canal and Wabash river by a line 69 miles long. Thirty miles commencing at Lafayette are nearly prepared for the iron. The balance of the line is to be laid the present spring. This company has a sufficient home subscription to prepare the road for the iron which it proposes to purchase with its bonds.

10. *Lafayette and Crawfordville Railroad*.—Connects the above towns by a line 28 miles long. The grading and bridging of this road is under contract to be completed the present season.

11. *Terre Haute and Indianapolis Railroad*.—Connects these two places by a line of 72 miles. The whole line with the exception of 16 miles is now under contract, and will probably be ready for the iron in the spring of 1851. This company has sufficient subscription to prepare the road for the rails.

12. *New Albany and Salem Railroad*.—Commences at New Albany at the foot of the falls of the Ohio, and runs thence northward to Salem, thirty-five miles. This company is now authorised to extend its road through Bedford, Bloomington and Gosport, a distance of 120 miles to Crawfordville, to meet the road from Lafayette to that place. This road is now ready for the iron to Salem, and has a sufficient quantity prepared for 18 miles. The grading is also under contract to Bedford, 65 miles from New Albany.

13. *Jeffersonville and Columbus Railroad*.—Extends from Jeffersonville, opposite Louisville, to Columbus, on the Madison railroad, a distance of 65 miles. The grading of about half of the road is nearly completed, and iron for about 20 miles has been provided, and will be laid the present season.

14. *Lawrenceburgh and Greensburg Railroad*.—Extending from Lawrenceburgh, on the Ohio river, twenty-four miles below Cincinnati, northwest, a distance of forty-two miles to Greensburg. This

road is intended to be continued about twenty-four miles, to a junction with the Madison road at Edinburgh.

15. *Cincinnati, Hamilton and Dayton Railroad*.—This road lies entirely within the State of Ohio, and is in rapid process of completion. The first section of this road, from Cincinnati to Hamilton, is intended to form a link in the road projected from the former city to Indianapolis. The contemplated line runs from Hamilton to Oxford, in Ohio—which is designated on the map; thence to Connersville, Indiana; thence to Rushville; thence adopting the Rushville road to Shelbyville, and thence direct to Indianapolis.

The above list contains only those roads which connect, or propose to connect, with the Madison and Indianapolis. They make an aggregate length of line of over 800 miles. All are in rapid process of construction, and will be rapidly pushed towards their completion. From the favorable nature of the country, these roads will be constructed at an average cost of about \$12,000 per mile. All of them can be prepared for the iron by the people along their lines. For this, and their equipment, most if not all of them, will be obliged to resort to a sale of bonds of the companies and of the various municipal corporations through which they run.

The above by no means embraces all the railway projects of Indiana. The *Evansville and Mount Carmel railroad* is under contract to Princeton, a distance of 28 miles from the Ohio. This road it is proposed to extend to Vincennes, 28 miles from Princeton, and from thence by one branch, to Terre Haute, 65 miles, and by another to Indianapolis, 110 miles.

The *Michigan and Ohio railroad* is to extend from Logansport, on the Erie and Wabash canal, to Anderson, on the Indianapolis and Bellefontaine railroad, and thence to New Castle and Knightstown; thus opening a communication with the Ohio at Madison and Cincinnati. Another road will soon be commenced, to connect the Erie and Wabash canal, and the roads running north from Indianapolis, with the Michigan Central and Michigan Southern railroads. This road will open a direct railway communication between Chicago and the Ohio.

The *Michigan Southern Railroad*, which is now being extended west to Chicago; and is to run from Cold Water, through Constantine, Michigan; and Goshen, Laport, South Bend and Michigan City, Indiana. No part of this road in Indiana has yet been commenced upon. From Hillsdale to Cold Water in Michigan, a distance of about 22 miles, the road has recently been put under contract.

The *Michigan Central Railroad* is now extending its road from New Buffalo, its present western terminus, around Lake Michigan to Chicago.

The above embraces most of the railroads which are now being vigorously prosecuted in Indiana. A few years will double this extensive list in this State, till every farmer is within convenient distance of one. This State is not alone in the West in the construction of railroads. She is but an example of which every Western State is doing. In the east we have but a faint idea of the magnitude and extent of public works that are going on in that section of the country, or of the ardor and enthusiasm enlisted in their prosecution.

If the Chicago Democrat thinks that articles from our paper are worth copying, we will thank it to give credit for them, and not introduce them as editorials into its own columns.

Tennessee.

East Tennessee and Georgia Railroad.—A gentleman connected with this road writes that—

"A stockholders meeting was held on the 20th ult., to act upon the acceptance of a loan of \$350,000 in State bonds, recently granted by the Legislature of the State, to be expended in the purchase of iron; the act requiring the heavy T or bridge rail to be laid. The vote upon the acceptance was unanimous, and there is not a doubt, that the road will be immediately completed to the Tennessee river, a distance of 80 miles from Dalton, Georgia, and but 30 from Knoxville, and you may now set it down as a fixed fact, that this important link in the great southeastern chain of railroads from New Orleans, is to be finished ahead of any of the other connecting roads.

Ohio.

New Railroads Chartered.—The following is a list of the railroad companies chartered by the Legislature of Ohio at its last session, viz:—Springfield and Mansfield, Ohio and Indiana, West Liberty Central, Franklin Pickaway and Ross county, Bellefontaine and Columbus, Mohegan Valley, Toledo, Norwalk and Cleveland, Ripley and Leesburgh, Gallipolis, Jackson and Chillicothe, Muskingum Valley, Steubenville and Wellsville, Monroe and Findlay, Cleveland and Maumee, Owl Creek Valley, and the Bucyrus and Toledo railroad companies, 15 in all. Seventeen acts were passed authorising the subscription by counties, cities and towns to the stocks in railroads. The same Legislature also incorporated 50 companies for the purpose of building plank roads.

Pacific Railway.**Philadelphia Convention.**

We give in our present number a synopsis of the proceedings of the above convention held on the first instant. As far as its action was concerned it did but little, except to reiterate the positions taken by its predecessor at St. Louis, to declare the necessity of this work, and to urge upon Congress the adoption of the necessary steps preliminary to commencing actual operations. This is all that it could properly do. The adoption of any particular plan, or route, would be merely taking for granted what remains to be proved, and could only result in evil and delay. The tendency of the convention will be to give a renewed impetus to the popular sentiment which favors this work, to accelerate the action of Congress, and this is all we presume that its members had in view.

The great feature of the convention is the letter of Mr. Fremont. We give it entire to our readers. If it may be relied upon, it will do more to secure an immediate commencement of the work than anything which has yet appeared, or than any conviction which has existed in the public mind.—Those best fitted to appreciate the difficulties in the construction of a railroad to the Pacific, have been the most sceptical as to its practicability. If Mr. Fremont's observations and information are reliable, the feasibility of the work is certainly demonstrated, and should further surveys confirm his statements, Congress will find itself compelled by the unanimous voice of our whole people to commence its immediate construction. The explorations of Mr. Fremont show how important a knowledge of the country becomes in forming any plan or route for this great work. How perfectly it illustrates the folly of all Mr. Whitney's schemes. He claims to be the first person who presented a matured plan of a railroad to the Pacific. His plan

was matured with hardly the slightest knowledge of the facts upon which a feasible plan can be formed. His facts were summoned from his imagination to suit his theory, and when these are found to have no actual existence his whole plan vanishes into air. The great argument for an extreme northern route was the want of timber, on a more southern line. The exact reverse of this is the truth. We had always supposed that timber was much more abundant south of the line proposed by Mr. Whitney, than upon it.

The true course to be pursued by the friends of this work, is indicated in the resolution offered by Mr. Roberts. We hope to see it vigorously acted upon. Let such a demonstration be made, that Congress shall not dare to hesitate to act.

It will be seen that one of the resolutions offered by Mr. T. B. Florence, and referred to the committee on resolutions, adopts the plan of management of the road put forth by us in our paper of the 29th Sept. last.

OCEAN STEAM NAVIGATION.

In a few weeks we shall have a semi-weekly steam communication with Europe. The following steamers will run as regular packets:

Collins' Line.—Atlantic, Pacific, Arctic, Baltic, Adriatic.

Cunard's Line.—Asia, Africa, America, Caledonia, Cambria, Europa, Hibernia, Niagara, Canada.

Glasgow Line.—City of Glasgow.

Hanburgh Line.—Helena Slowman.

Bremen Line.—Washington, Hermann.

Havre Line.—Franklin.

The weekly trips of the Cunard steamers will commence on Saturday next, from Liverpool, and on the first of May from New York and Boston.—The Collins steamers will commence their semi-monthly trips on the 27th inst., and their weekly trips about the first of June. The Franklin will begin her trips to Havre next month, and her mate will be ready in the fall. The Bremen line now leaves Southampton and New York once a month. The City of Glasgow will leave Glasgow on the 16th inst. for New York, and thereafter leave each port in alternate months. The Helena Slowman is to leave Hamburg on the 10th instant, and her trips will be bi-monthly.

According to this arrangement, we shall, in about a month hence, receive news every three days from Europe.

NEW RAILROAD MAP.

Septimus Norris, Esq., of the Schenectady Locomotive Works, is about publishing a map containing all the railroads in operation in the United States, showing the route of each road, the towns passed through, distances from town to town, and the grades.

Mr. Norris wishes us to say that he would feel himself under great obligations to those having maps, showing plans of roads, if they would forward him a copy; if not, to give the names of the towns through which the road passes, and the distances from one to the other, also the grades, and any other information that may be of interest.

A large amount of matter is excluded this week by the proceedings of the Philadelphia Convention.

NOTICE TO SUBSCRIBERS.

Such of our Subscribers as wish for back numbers of our paper to complete their sets, or who may not have received the index of the past year, are requested to send for them without delay.

CONTRACTORS

Will find an unusually large amount of heavy work advertised in our paper, by very responsible companies.

RAILROAD IRON.

The attention of the iron interest is invited to the advertisement of the Virginia and Tennessee railroad for a large quantity of iron for this road.

The Railroad Journal.

The American Railroad Journal was the earliest work published in any part of the world devoted to the railway interest. In its pages is to be found the only full and complete history of railway progress, the only authentic record of the discoveries and improvements which the greatest of practical sciences has drawn forth and perfected.

The means of enhancing its value under its present proprietorship are far greater than when we assumed its charge about one year ago. It will continue to furnish the best practical results as to the construction and working of railroads, the details of progress in steam navigation, commerce, mining, manufactures, banking and the mechanic arts.

The best practical talent that can be enlisted in the country is engaged to supply its pages. The mining interest will find evidence of the first systematic attempt to give a full view of the iron, copper and lead ores of the country, with the results of practical working. In all the branches of mechanical industry we seek to discard the crude conceits of unskilled pretension, the thousand useless novelties issuing from the Patent Office, and to give encouragement to whatever can be made useful in relieving the wants, in ministering to the pleasures, or contributing to the advancement of the race.

We invite contributions to its pages from all who sympathize in our labors, information in any form from those most interested in the progress of mechanical invention, and substantial support from all who are willing to aid us in the arduous duties of our position.

Back Volumes of the RAILROAD JOURNAL

From its commencement can be had on application to this office.

Rosendale Cement.

THE NEWARK AND ROSENDALE LIME AND CEMENT CO. are now manufacturing at their works in NEWARK, N. J., and Ulster county, N. Y., a very superior article of *Hydraulic Cement*—also *Lime Calcine Plaster*, etc. Contractors and dealers will find it to their advantage to call or make application before purchasing elsewhere. All communications addressed to the subscriber, at Newark, N. J., will be punctually attended to.

1y*15

HENRY WILDE, Secretary.

Railroad Iron.

3,000 TONS C. L. MAKE 63½ lbs. per yard, now landing and to arrive.

Also contracts made for future delivery of above superior make English Iron.

300 Tons Banks Best Iron, Round, Square and Flat.

200 " English Bar "

10 " 9-16 Square Iron for Railroad Spikes.

For sale in lots to suit purchasers by

DAVID W. WETMORE.

New York, March 26, 1850.

3m

To Contractors.

THE Election of Directors of the Queenston Suspension Bridge Company having taken place, the Company are now prepared to receive Plans for the Bridge and Tenders for its erection. All communications to be directed, **GILBERT McMICKEN,** 1ml1*
Queenston, Canada W.

To Miners and Mining Companies.

THE undersigned would respectfully call the attention of those persons engaged in mineral operations on Lake Superior to the following list of articles which will be sold on accommodating terms, viz:

- 500 bbls. Corn fed No. 1 Mess Pork.
- 500 " Stall fed Mess Beef.
- 25,000 lbs. " Sugar cured canvassed" Hams.
- 2,200 " Dried Beef.
- 60,000 " " Kiln dried" Corn Meal,
- 500 bush. White "Field" Beans.
- 300 " Canada" Peas.
- 500 " Dried Apples.
- 100 bbls. and half bbls. "cucumber" Pickles.
- 50 " Sour Krout.
- 30 bush. Onions.
- 1,000 Beefs' Tongues Smoked and in Pickle.
- 10,000 lbs. "Mould" Candles.
- 10,000 " "Hard" Soap.

Also, a full and large supply of all articles that may be required by Mining Companies and those connected with them.

C. A. TROWBRIDGE,

127 Jefferson Avenue, Detroit, Michigan.

Pennsylvania Railroad.

PROPOSALS will be received at Blairsville, Indiana county, until the 18th of April next, for grading the Western Division of the Pennsylvania Railroad.

The work to be contracted for, embraces three short Tunnels, a number of Stone Bridges and Culverts, and some very heavy excavations and embankments.

For further information apply to EDWARD MILLER, Esq., Associate Engineer, at Blairsville.

J. EDGAR THOMSON, Chief Eng.
Engineers' Department, Pennsylvania R.R.,
Philadelphia, March 23, 1850.

Railroad Iron Wanted.

Virginia and Tennessee Railroad Office,
Lynchburg, Va., March 16, 1850.

PROPOSALS will be received at this Office until the 6th of May next, for the delivery in Lynchburg, of Iron Rails for the Virginia and Tennessee Railroad, to be manufactured in or near this town of Virginia.

The said Iron to be made of the best pig metal, and to be delivered at the following times, and in the following quantities, viz: Six thousand tons in the year 1851, and the remainder (about 15,000 tons) for the whole road, equally, in the years 1852 and 1853.

Separate proposals will also be received for the delivery in Lynchburg, of pig metal, at times and in quantities sufficient for the manufacture of the rails above mentioned, said delivery to commence as early as the first of November, 1850.

The rails and the pig metal will be subjected to strict inspection; the rails are to weigh about 60 lbs. per yard.

At the same time, proposals will be received for the above quantity of Iron, manufactured anywhere else in America or in England, to be delivered in Lynchburg or Richmond, under the same general conditions as those prescribed for Virginia Iron, manufactured at Lynchburg. Satisfactory security will be required.

Proposals for delivering any portion of the above mentioned quantity, and at periods varying from those specified above, will be considered.

By order of the Board of Directors.

151f

CHAS. F. M. GARNETT,
Chief Engineer.

Notice to Contractors.

Ohio and Pennsylvania Railroad.

PROPOSALS will be received at the office of the Ohio and Pennsylvania Railroad Co., in the city of Pittsburgh, until Wednesday, the 24th day of April, 1850, for the Grading and Masonry of the Railroad, from Allegheny city to the mouth of Big Beaver, a distance of twenty-four miles. Drawings and Specifications of the work to be let, may be seen at the office in Pittsburgh, for one week previous to the letting, on application to Solomon W. Roberts, Chief Engineer, and information may be obtained at any time at the office of Edward Warner, Resident Engineer of the Eastern Division, New Brighton, Beaver County, Pa. The work is well worthy of the attention of good contractors.

The Grading and Masonry of the line in Columbiana County, Ohio, will be let at Salem, on Wednesday, the 8th of May.

By order of the Board of Directors.

151f

WM. ROBINSON, Jr.

W. Milnor Roberts,

Bellefontaine and Indiana Railroad, Marion, Ohio.

Notice to Contractors.

Bellefontaine and Indiana Railroad.

SEALED PROPOSALS will be received at the Company's Office in Sidney, Shelby Co., Ohio, on and after Wednesday, May 5th, 1850, for doing the Grubbing, Clearing, Grading and Masonry, of such portions of the BELLEFONTAINE and INDIANA Railroad, as can be prepared for letting by the 15th.

The line extends from some point on the Cleveland, Columbus and Cincinnati Railroad, through MARION, BELLEFONTAINE and SIDNEY, to the STATE LINE, between Ohio and Indiana, a total distance of about 120 miles.

It is expected that the line from the eastern terminus to Marion, about 22 miles, and from Bellefontaine to Sidney, about 23 miles, will then be ready to let; and the remainder of the route as soon thereafter as it can be located and prepared.

Specifications and plans will be ready for inspection and all necessary information may be obtained on application at the Office of the Chief Engineer, in Marion, or to J. Pemberton, Resident Engineer, in Sidney, after the 5th of May.

By order of the Board of Directors.

W. MILNOR ROBERTS, Chief Eng.
Engineer's Office, Marion, Ohio,
March 13, 1850. 151f

To Contractors.

SEALED PROPOSALS will be received at the Office of the Nashville and Chattanooga Railroad Company in Chattanooga until the 20th day of May next, for the graduation and masonry of the Chattanooga Division of said Road—embracing a distance of 27½ miles.

The graduation will be heavy for about 15 miles, (in crossing Raccoon Mountain, and passing around Lookout Mountain bluffs), the balance, average work. The masonry will consist chiefly of cut stone Piers for Tennessee River Bridge, (about 4,000 Perches), Piers for running Water Bridge, (about 2,000 Perches), and Pier for Lookout Creek Bridge, about 500 Perches.

Sealed proposals will also be received at the same time and place, for the graduation of 10 miles of the Eastern end of the Winchester Division—embracing some heavy work. Also the masonry of Elk River and Widow's Creek Bridges.

Plans and Profiles of the Work will be exhibited, specifications furnished, and all other desired information given, on application to Mr. James A. Corry, the Engineer in charge of the work, at the Company's Office in Chattanooga, from the 10th of May until the day of letting.

Before making bids the line should be thoroughly examined. The depths of the Cuts and Embankments can be ascertained from the centre stakes. The work to be commenced immediately after the letting. And that portion from Chattanooga to Lookout Bluffs to be completed by the 1st of December next. The other sections to be finished successively on toward the West end of the Division—the last by the 1st of October, 1851.

The most satisfactory testimonials will be required. The payments will be made in cash—reserving the usual 20 per cent. until the completion of the work.

By order of the Board.

JAMES H. GRANT, Chief Eng.
Nashville, Tenn., March 14, 1850.

TO CONTRACTORS.

NOTICE is hereby given, that from 30 to 60 miles of the Orange and Alexandria Railroad will be ready for examination between 1st and 15th of April next. The road passes through a very healthy and fertile region, and embraces an amount of work every way worthy of the attention of able and experienced men.

The Company prefers to let the whole work of construction in contracts of not less than 30 miles, and for that purpose parties wishing further information are invited to call at the office in Alexandria.

The bids will be made on a basis of payments in cash to the amount of 85 per cent, and the remaining 15 per cent in the stock of the company. They must be sent to this office not later than the 16th day of April next, to be submitted to the meeting of the Board of Directors to be held on the 18th of the same. By order of the Board.

T. C. ATKINSON,
Chief Engineer.

For the information of parties at a distance, it is well to state that the Orange and Alexandria Railroad is about 90 miles long, and extends from Alexandria through Fairfax, Prince William, Fauquier, Culpeper and Orange counties to Gordonsville, a point on the completed portion of the Virginia Central Railroad, formerly called the Louisa railroad.

An inspection of the map will show that its connections promise to make it as valuable a thoroughfare as any in the Union.

American Railway Guide, AND POCKET COMPANION FOR THE UNITED STATES;

CONTAINING Correct Tables, showing the time for starting of trains from all stations, distances, fares, etc., on all the Railway lines in the U. States; also many of the principal Steamboat and Stage routes—accompanied by a complete RAILWAY MAP. Price, single copies 10 cts., or \$1 per annum. Published on the first of every month, corrected from returns furnished by the Railway Superintendents throughout the Union.

This book has been compiled somewhat on the plan of Bradshaw's Guide, with such improvements in size, form and arrangement as have seemed desirable; and the publisher confidently hopes it will not be found liable to the objections of incompleteness and incorrectness, which have been made, and justly too, against various other similar works heretofore issued.

The subscriber having had the management of the NEW YORK PATHFINDER almost from its commencement, has enjoyed superior facilities in obtaining information relating to the thoroughfares of travel, and is therefore well qualified to prosecute with success the arduous undertaking of furnishing a complete and correct national guide book.

STRINGER & TOWNSEND, General Agents,
222 Broadway: and sold also by Booksellers and Periodical Dealers generally throughout the country; also on all the Railways and Steamboats.

CURRAN DINSMORE, Publisher.

N. Y. Pathfinder Office,
123 Fulton St., New York City.

Great American Engineering AND MECHANICAL WORK, just published in medium folio, 75 cts.

Part III of "Specimens of the Stone, Iron and Timber Bridges, &c. &c. of the United States Railroads." By George Duggan, Architect and Civil Engineer.

The present part contains beautifully executed plans, elevations, sections and isometrical views of the elegant timber arch 275 feet span, at Cascade Creek, Pa. on the line of the N. Y. & Erie R. R., and of a plank bridge 100 feet span across the Mahawk River near Rome, on the line of the U. and S. R.R. with the specifications, estimates, bills of timber, iron, etc.

N.B.—This work is published by subscription of the most eminent in the engineering profession of the U. States, and will be completed in 12 parts, at 75 cents each to those who remit their names and subscriptions before the 1st May next, after which the price will be raised to \$1 per part.

To those making a present remittance of \$5, and the remainder \$4, when they have been supplied with the first six parts, the work will be forwarded regularly as published. Parties remitting \$9 shall receive it monthly post-free in any part of the United States.

"It is a work that was a great desideratum, and must prove of great benefit to the engineering profession generally, and especially to the tyro in practical engineering and mechanical knowledge; in truth it strikes us, that it would require years of labor and patient toil on the part of a young engineer to prepare the drawings, and collect the information that will be embodied in this work, and can now be secured for the trifling sum of \$9"—(Scientific Amer. March 16, 1850.)

In connection with this subject (Iron Railroad Structures) we take occasion to call attention again to Mr. Duggan's valuable and expensive publication, exhibiting drawings, with full descriptions of the various stone, iron and wooden bridges, viaducts, tunnels, culverts, etc., of all the Railroads in the United States. Mr. Duggan is an accomplished Architect and Civil Engineer, who came from Ireland to this country to exercise his profession; but finding railroad construction here, in many respects, different from that he had been accustomed to in Europe, he applied himself to the study of our system; and the fruits of his researches and investigations embodied in this work, are well calculated to meet the exigencies of engineers, and to assist draughtsmen, bridge builders, mechanics and students. The work will be supplied to subscribers only, in 12 parts, at 75 cents each.—[N. Y. Journal of Commerce, Feb. 14, 1850.]

Published by GEORGE DUGGAN,
172 East Broadway, New York.

CAUTION.

RAILROAD COMPANIES and others are hereby cautioned against using or vending our improvement for easing the lateral motion as applied on Railroad Cars. Letters Patent having been granted to us in 1841, any party or parties so making or using said improvement without license from us will be proceeded against according to law.

DAVENPORT & BRIDGES.

WHISTLER MONUMENT Association.

MAJOR T. S. BROWN having, in leaving this country, resigned his office as Treasurer of this Association, the Committee appointed for that purpose have selected as his successor GEO. M. DEXTER, Esq., of Boston.

Those desiring to subscribe will therefore please direct their communications to Geo. M. Dexter, Civil Engineer, etc., Boston, Mass.

A. W. CRAVEN, Secretary, etc.

New York, February 22, 1850.

United States Railroad Guide and Steamboat Journal.

CONTAINING OFFICIAL TIME ADVERTISEMENTS, Tables of Stations, Distances, Fares, Time, etc., with much miscellaneous matter for the travelling public. Price 12 cents a copy. Yearly subscription \$1. Published at 43 Ann street, New York.

Henry J. Ibbotson,

IMPORTER of Sheffield and Birmingham Goods. Also, Agent for the Manufacture of Telegraph Wire. 218 PEARL ST., NEW YORK.

FWLER M. RAY'S Patent India-rubber Railroad CAR SPRING.

New York and Erie Railroad Shops. Piermont, March 26, 1850.

This will certify that from practical experience in the use of Fowler M. Ray's India rubber Car Springs, I believe them to be far superior to any others now in use.

I have never known them to be affected by any change of temperature, as other Rubber Springs have been affected on this road.

I am at the present time repairing a Passenger Car that Mr. Ray and myself mounted with his springs about two years and eight months since.

The springs are at the present time as perfect, to all appearances, as when first applied to the car.

Respectfully yours,

HORACE B. GARDNER, Foreman of the Car Shops.

Old Colony Railroad Office, Boston, March 6, 1850.

EDWARD CRANE, Esq.,

President New England Car Co.,

Dear Sir: In compliance with your request I would state that the Old Colony Railroad Com'y have had in use upon their road, India-rubber Springs furnished by your company, for more than eighteen months past, during which time they have been extensively used under Passenger and Freight Cars, Locomotive Tenders, and for Drawer and Buffering Springs, with the most perfect success. The elasticity and consistency of the Rubber has never been unfavorably affected by either extremes of heat or cold—and from the experience which we have had in the use of Rubber Springs, I think them well adapted for railroad purposes—and therefore we have for some months past used Rubber almost exclusively, in all places where springs are required.

Respectfully yours, etc.,

JAS. H. MOORE, Supt. O. C. Road.

Troy, February 27, 1850.

We have been using your India-rubber Car Springs for nearly two years—and we take pleasure in saying that in our opinion the rubber has to a certain extent already, and may eventually entirely supersede all other Springs for Railroad Car purposes. We now use it entirely for Draw Springs and Bumpers, considering it better and lighter than steel.

During our two years' experience in the use of it, we have not known any to lose their elasticity, or fail in any way; and we cheerfully recommend the rubber for railroad car springs. Very respectfully,

EATON, GILBERT & CO.

Fall River, February 2, 1850.

In answer to yours of the 20th ult. I would say that this company has for some 10 or 12 months past been using "Ray's India-rubber Springs." We have applied them to both passenger and freight cars with uniform success. They have invariably preserved their elasticity and consistency through all the extremes of weather; and we are now applying them whenever the steel spring fails. I am well satisfied that they are particularly adapted for railroad purposes.

Very respectfully yours,

GEO. HAVEN, Supt. Fall River Railroad.

Supt. Office N.Y. & H. R.R., New York, March 8, 1850.

This is to certify that we have used the Rubber Springs manufactured by Mr. F. M. Ray for the past twenty months, "both for Passenger and Freight Car Springs and Bumpers, and of different sizes," and have in every case given entire satisfaction, and I consider them the best spring now in use.

M. SLOAT, Supt.

Jersey City, March 9, 1850.

This is to certify that the present form of Mr. F. M. Ray's India-rubber Car Spring I consider far superior to the form of Disk, having used both forms.

I take pleasure in recommending these springs to all railroad companies. DAVID H. BAKER, Foreman of Car Shop of N.J. R.R. & Trans. Co.

Harlem R.R. Depot, New York, March 7, 1850.

This is to certify that we have used Mr. F. M. Ray's India-rubber Springs for over eighteen months, and find them to be easy and durable, and recommend them to railroad companies as being superior to anything we have tried.

J. M. SMART, Foreman at 42d St. Depot.

Office of the New Jersey Railroad Co., Jersey City, March 7, 1850.

This is to certify that we have had Mr. F. M. Ray's India-rubber Springs in constant use under our cars, and as Bumper Springs for upwards of two years, and they have in every way given perfect satisfaction.

The present form of spring we deem far superior to the form of Disk, having used both forms, although we have none of those made in Disks at present in use.

We take pleasure in recommending these springs to all railroad companies.

J. P. JACKSON, Vice Prest. New Jersey Railroad and Trans. Co.

Roxbury, February 28, 1850.

In compliance with your request, I take great pleasure in stating the result of my experience in the use of "Ray's Patented Vulcanised India-rubber Car and Engine Springs." We have used them nearly two years, and never had one fail in any way. The cold weather does not affect them, as it has other rubber springs we have used.

With sixteen years' experience as superintendent of machinery on the Boston and Providence railroad, I take pleasure in saying that your springs are the best we ever used, or I ever saw used elsewhere. We have 20 cars rigged with them, of which I can say that the springs are as good now as when first applied. I put 24 lbs. of the rubber under the forward end of one of our heaviest engines, taking off 250 lbs. of steel springs—it has been in use 18 months, and is in as good condition now as when first put under the engine.

Very respectfully yours,

GEO. S. GRIGGS, Supt. of Machinery, Boston and Prov. R.R.

Boston, March 5, 1850.

In answer to your enquiry about India-rubber Springs, I have to say that we have used them to a considerable extent on both freight and passenger cars, and also on several of our tenders; and I am very well satisfied that they answer all the purposes for which they are intended. I believe the India-rubber will soon supersede all other springs for cars and tenders. Yours truly,

S. M. FELTON, Supt. Fitchburg Railroad.

New York, March 11, 1850.

I have used the Patent India-rubber Spring purchased of Mr. Ray, upon the cars of the New York and New Haven Railroad, and have found them efficient and economical; and when applied to the axles and draw springs, believe them to be quite equal to any in use. I have found a combination of these springs with a steel spring under the transom beam a very satisfactory arrangement, and am now using this plan in all new cars.

Yours respectfully,

ROBERT SCHUYLER.

February 25, 1850.

From practical observation of the use of the India-rubber Car Springs, manufactured and sold by your company, we are entirely satisfied in their application, and do not hesitate to recommend them as elastic, durable, requiring no repairs for years, and retaining their consistency during all extremes of weather. We have applied them for the past two years, and consider them superior for all railroad purposes.

Yours truly,

OSGOOD BRADLEY, Car Builder, Worcester.
T. & C. WASON, do. Springfield.
DEAN, PACKARD & MILLS, do. do.
DAVENPORT & BRIDGES, do. Cambridgeport.

Office New Jersey Railroad Co., Jersey City, March 8, 1850.

FOWLER M. RAY, Esq.,

Dear Sir: In answer to your enquiries respecting the operation of the Vulcanised Rubber Springs, purchased by our company from you some two years since, I reply that they are superior to any spring in use, (that I have either seen or heard of).

The improved form of your spring, consisting of a solid piece of vulcanised rubber with bands on the outside, is far superior to your first form, consisting of disks of rubber with metallic plates interposed.

The last named form was tried, if you recollect, at a much earlier period; and then was replaced by your last form.

I have no hesitation in saying that your springs have given entire satisfaction, and most cheerfully recommend them to railroad companies throughout the country for the following reasons:

- 1st. The cost is 30 per cent. less.
- 2d. Saving of weight on each car of 8 wheels from 700 to 800 lbs.
- 3d. Less care and attention is required, as they are not liable to get out of repair.
- 4th. A great saving is secured in the wear and tear of the cars and rails from their great elasticity.
- 5th. The freedom from noise.
- 6th. There is greater safety in case of accident, as they cannot be broken.
- 7th. The comfort of passengers is enhanced sufficiently to pay the expense, waiving all the other reasons that I have given.

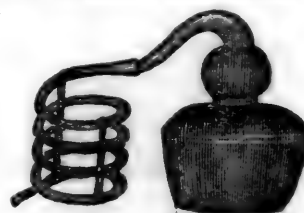
Should this fail to satisfy any person enquiring, you are at liberty to refer to me, No. 150 Washington St., Jersey City. Yours respectfully,

T. L. SMITH, Supt.

Passenger Car Linings.

THE Advertiser continues to make to order the Enamelled Car Linings which have been so highly approved the last three years, and are now exclusively used by all the Northern Railroads. No pains are spared to get out new styles, and adapt them to the tastes of every consumer.

Orders addressed to CHARLES STODDER, No. 75 Kilby street, Boston, will have prompt attention. March 23, 1850. 2m



P. H. Griffin,

Corner of Steuben and James Sts. Albany, N.Y. CONTINUES to manufacture copper flues for locomotive boilers, brewers' coppers, stills, tanner heaters, etc. Copper work in general, at the shortest notice. He has constantly on hand brass cocks, brass valves, copper pumps of every variety. Orders promptly attended to. 1y14

To Practical Machinists.

AN excellent opportunity now occurs to a practical Machinist, of WELL ESTABLISHED REPUTATION, and some capital, to engage extensively in the STEAM ENGINE, BOILER and FOUNDRY BUSINESS.

An establishment is now ready for business, ample in all its details, including extensive wharf room, for any sized steamboats, and from its position, if properly conducted, will doubtless command a large share of business.

A practical Machinist, as a partner is required, to conduct the whole establishment: and only those FULLY COMPETENT need apply. Address (post paid) "MACHINE CO.," Box No. 741, Philadelphia, Pa. 1m14

Spikes, Spikes, Spikes.

ANY person wishing a simple and effective Spike Machine, or a number of them, may be supplied by addressing J. W. FLACK, Troy, N.Y. March 6, 1850.

Gas Fixtures.

FIXTURES for Burning Gas for Lighting Public Buildings, Private Dwellings, Stores and Factories, manufactured by the subscriber in great variety. Orders by Mail, or left at the Factory on Causeway street, will be promptly attended to.

HENRY N. HOOPER & CO. Boston, March 23, 1850. 6m13

To the Proprietors of Rolling Mills and Iron Works.

THE Undersigned—Proprietors of Townsend's Furnace and Machine Shop, Albany—are extensively engaged in the manufacture of Machinery and fixtures for Iron, and Copper Rolling Mills, and Iron Works. Having paid particular attention to the manufacture of *Rolls* (Rollers), both *chilled* and *dry-sand*, they feel confident that they can execute orders for such castings in a satisfactory manner. And to give assurance of this, they beg leave to refer to the following named persons, proprietors and managers of some of the most extensive rolling mills in the country, viz: Jno. F. Winslow, J. Tuckerman, H. Burden, W. Buritt, J. & J. Rogers, Saltus & Co., J. B. Bailey, L. G. B. Cannon, Hawkins & Atwater, etc., etc.

F. & T. TOWNSEND.

Albany, August 18, 1849.

Arch St. Machine Shop.

BIRKENBINE, MARTIN & TROTTER,
Makers of

STEAM ENGINES,

and

HYDRAULIC MACHINERY,

NO. 16 ARCH STREET,

PHILADELPHIA.

Will construct Steam Engines, Pumps, for Draining Mines and Land; supplying Water to Towns, Factories, Farms, etc;

Also, Street Stops, Fire Plugs, Water Tanks, and Hydraulic Rams, with

(BIRKENBINE'S PATENT VALVES.)

B., M. & T. contract for Warming and Ventilating Buildings by Steam or Warm Water.

THE NEWCASTLE MANUFACTURING Co. continue to furnish at the Works, situated in the town of Newcastle, Del., Locomotive and other steam engines, Jack Screws, Wrought Iron Work and Brass and Iron Castings, of all kinds connected with Steamboats, Railroads, etc.; Mill Gearing of every description; Cast Wheels (chilled) of any pattern and size, with Axles fitted, also with wrought tires, Springs, Boxes and bolts for Cars; Driving and other wheels for Locomotives.

The works being on an extensive scale, all orders will be executed with promptness and despatch. Communications addressed to Mr. William H. Dobbs, Superintendent, will meet with immediate attention.

ANDREW C. GRAY,

President of the Newcastle Manuf. Co.

Brown's Old Established SCALE WARE HOUSE,

NO. 234 WATER ST., NEW YORK.

THE Subscriber, Practical Manufacturer of Scales of every description, respectfully asks the attention of Railroad Companies to his Improved Wrought Iron Railroad Track and Depot Scales which for strength, durability, accuracy, convenience in weighing, and beauty of workmanship, are not surpassed by any others in this country.

He is aware that this is rather a bold assertion for him to make, yet he can say with confidence that they have but to be tried to give them precedence over all others.

J. L. BROWN.

Bank Scales made to order, and all Scales of his make Warranted in every particular.

References given if required.

4tf

ENGINEERS.

Baneks, C. W.,

Civil Engineer, Vicksburg, Miss.

Berrien, John M.,

Michigan Central Railroad, Marshall, Mich.

Buckland, George,

Troy and Greenbush Railroad.

Clement, Wm. H.,

Little Miami Railroad, Cincinnati, Ohio.

Cozzens, W. H.,

Engineer and Surveyor, St. Louis, Mo.

Davidson, M. O.,

Eckhart Mines, Alleghany Co., Maryland.

Fisk, Charles B.,

Cumberland and Ohio Canal, Washington, D. C.

Felton, S. M.,

Fitchburg Railroad, Boston, Mass.

Floyd-Jones, Charles,
South Oyster Bay, L. I.

Gzowski, Mr.,

St. Lawrence & Atlantic Railroad, Montreal, Canada.

Gilbert, Wm. B.,

Rutland and Burlington Railroad, Rutland, Vt.

Grant, James H.,

Nashville and Chattanooga R. R., Nashville, Tenn.

Harry, P.,

Binghamton, New York.

Holcomb, F. P.

Southwestern Railroad, Macon, Ga.

Johnson, Edwin F.

New York and Boston Railroad, Middletown Ct.

Latrobe, B. H.,

Baltimore and Ohio Railroad, Baltimore, Md.

Miller, J. F.,

Worcester and Nashua Railroad, Worcester, Mass.

Morris, Elwood,

Schuylkill Navigation, Schuylkill Haven, Pa.

Morton, A. C.,

Atlantic and St. Lawrence Railroad, Portland, Me.

McRae, John,

South Carolina Railroad, Charleston, S. C.

Nott, Samuel,

Lawrence and Manchester Railroad, Boston,

Prichard, M. B.,

East Tennessee and Georgia R. R., Cleveland, Tenn.

Roebbling, John A.,

Trenton, N. J.

Roberts, Solomon W.,

Ohio and Pennsylvania Railroad, Pittsburgh, Pa.

Sanford, C. O.,

South Side Railroad, Virginia.

Schlatter, Charles L.,

Northern Railroad (Ogdensburg), Malone, N. Y.

Sours, Peter,

Rahway, New Jersey.

Stark, George.,

Bost., Con. and Mont. R. R., Meredith Bridge, N. H.

Steele, J. Dutton,

Pottstown, Pa.

Trimble, Isaac R.,

Philad., Wil. & Baltimore Railroad, Wilmington, Del.

Tinkham, A. W.,

United States Fort, Bucksport, Me.

Thomson, J. Edgar.,

Pennsylvania (Central) Railroad, Philadelphia.

Whipple, S.,

Civil Engineer and Bridge Builder, Utica, N. Y.

Williams, E. P.,

Auburn and Schenectady Railroad, Auburn, N. Y.

Williams, Charles H.,

Milwaukee, Wisconsin.

Wormeley, Preble,

Central Ohio Railroad, Zanesville, Ohio.

HOTELS.

JONES' HOTEL,

NO. 152 CHESTNUT STREET,
PHILADELPHIA.

BRIDGES & WEST, Proprietors.

DUNLAP'S HOTEL,

On the European Plan,
NO. 135 FULTON STREET,
Between Broadway and Nassau St.,
NEW YORK.

BUSINESS CARDS.

Nathan Caswell,

METAL BROKER, 69 WALL ST., N. Y.

For the Purchase and Sale of Railroad Iron (new and old,) Boiler Plates, Pig and Bar Iron, Lead, Tin, Copper, Spelter, etc. Refers to

Messrs. Boorman, Johnston, & Co., New York.

" Grinnell, Minturn & Co., "

" Barston, Pope & Co., "

" Earps & Brink, Philadelphia. "

" E. Pratt & Brother, Baltimore.

John Barstow, Esq., Providence.

Lewis Bullard, Esq., Boston.

February 9, 1850.

6m*

VanRensselaer Stevens,

Sup't Transportation Providence and Worcester R.R., Providence, R.I. Has had 13 years' experience in Operating Railroads. Will go South or West if applied to.

J. & Riley Carr,

Manufacturers of Cast, Shear, German and Blister

STEEL,

Of all Descriptions, Warranted Good.
BAILEY-LANE WORKS, SHEFFIELD.

R. S. DENTON, Agent,

NO. 20 CLIFF ST., NEW YORK.

STEEL AND FILES.

R. S. Denton,

20 CLIFF STREET, NEW YORK,

AGENT FOR

J. & Riley Carr's

BAILEY-LANE WORKS, SHEFFIELD,
Manufacturers of Cast, Shear, German and Blister

STEEL

Of all descriptions. Warranted Good

FILES.

Manufacturers of Machinists' Warranted Best Cast Steel Files, expressly for working upon Iron and Steel, made very heavy for recutting.

A full Stock of Steel and Files at all times on hand.

6m4

Cumberland, (Md.) Coals for Steaming, etc.

ORDERS RECEIVED FOR AND FILLED
by J. COWLES, 37 Wall St., N. Y.

George O. Robertson,

BROKER IN SCOTCH AND AMERICAN PIG IRON;

Bar Iron, Lead, Spelter, Tin, Copper, etc.,

No. 4 Liberty Place, MAIDEN LANE,

(Near Broadway.)

NEW YORK

Manufacture of Patent Wire ROPE AND CABLES,

For Inclined Planes, Suspension Bridges, Standing Rigging, Mines, Cranes, Derrick, Tilters, &c., by

JOHN A. ROEBLING, Civil Engineer,

TRENTON, N. J.

Samuel D. Willmott,

MERCHANT, AND MANUFACTURER OF
CAST STEEL WARRANTED SAWS,

IMPORTER OF THE

GENUINE WICKESLY GRINDSTONES

NO. 8 LIBERTY STREET,

NEW YORK.

Doremus & Harris,

ANALYTICAL & CONSULTING CHEMISTS,
179 BROADWAY, NEW YORK.

SCHOOL OF CHEMISTRY.

Dudley B. Fuller & Co.,

IRON COMMISSION MERCHANTS,
No. 139 GREENWICH STREET,

NEW YORK.

Manning & Lee,

GENERAL COMMISSION MERCHANTS,
NO. 51 EXCHANGE PLACE,

BALTIMORE.

Agents for Avalon Railroad Iron and Nail Works;
Maryland Mining Company's Cumberland Coal 'CED'
—Potomac' and other good brands of Pig Iron.

Railroad Car Manufacturer's Furnishing Store. F. S. & S. A. MARTINE, IMPORTERS AND MANUFACTURERS OF RAILROAD CAR & CARRIAGE LININGS, PLUSHES, CURTAIN MATERIALS, ETC., 112 WILLIAM ST., NEAR JOHN.

3-4 and 6-4 Damasks, Union and Worsted; Moireens, Rattinetta, Cloths, Silk and Cotton Velvets, English Buntinges

S. W. Hill,

Mining Engineer and Surveyor, Eagle River, Lake Superior.

Alfred W. Craven,

Chief Engineer Croton Aqueduct, New York.

Starks & Pruyn,

MANUFACTURERS OF ALL KINDS OF
STEAM BOILERS,

52 and 54 Liberty, corner of Pruyn street

Nathan Starks, Special Partner
Wm. F. Pruyn, R. H. Pruyn,
Iron Railing, Bank and Vault Doors, Iron Shutters
Bridge and Roof Bolts, Heavy Jobbing and Forging
of all kinds.

For particulars see Adv. in another column.

To Engineers and Surveyors.

E. BROWN AND SON Mathematical Inst. makers No. 27 Fulton Slip, New York, make and keep for sale, Theodolites, Levelling inst., Levelling rods, Surveyors Compasses, and Chains, Cases of Mathematical drawing Insts. various qualities, together with a general assortment of Ivory Scales and small Insts. generally used by Engineers.

Samuel Kimber & Co., COMMISSION MERCHANTS WILLOW ST. WHARVES, PHILADELPHIA.

AGENTS for the sale of Charcoal and Anthracite
A Pig Iron, Hammered Railroad Car and Locomotive Axles, Force Pumps of the most approved construction for Railroad Water Stations and Hydraulic Rams, etc., etc.
July, 27, 1849.

James Herron, Civil Engineer,

OF THE UNITED STATES NAVY YARD,
PENSACOLA, FLORIDA.

PATENTEE OF THE

HERRON RAILWAY TRACK.
Models of this Track, on the most improved plans, may be seen at the Engineer's office of the New York and Erie Railroad.

To Railroad Companies.

—WROUGHT IRON WHEELS—
SAFETY AND ECONOMY.

**NORRIS' LOCOMOTIVE WORKS,
SCHENECTADY, NEW YORK,**

Are Manufacturing Wrought Iron Driving, Truck, Tender, and Car Wheels—made from the best American Iron. Address E. S. NORRIS.
May 16, 1849.

Machinery Warehouse.

S. C. HILLS, No. 43 Fulton street, New York, has constantly for sale Steam Engines, Boilers, Lathes, Chucks, Drills, Planers, Force and Suction Pumps; Tenoning, Morticing and Boring Machines, Shingle Machines, Bolt and Nut Machines, Belting, Oil, Iron and Lead Pipe; Rubber, Percha and Leather Hose, &c., &c.

S. C. H.'s arrangements with several machine shops are such that he can supply, at very short notice, large quantities of machinery.

November 23, 1849.

Cruse & Burke,

Civil Engineers, Architects and Surveyors,
Office, New York State Institution of Civil Engineers,
STATE HALL, ALBANY, N. Y.

Drawings, specifications and surveys accurately executed. Pupils instructed theoretically and practically at a moderate premium.
May 26, 1849.

Eaton, Gilbert & Co.,
Railroad Car, Coach and Omnibus Builders,
TROY, N. Y.

**Hudson River Foundry,
THOMAS & COLLINS,**
130 Quay Street, Albany.

To Railroad & Navigation Cos.

Mr. M. Butt Hewson, Civil Engineer, offers his services to Companies about to carry out the surveys or works of a line of Navigation or Railroad. He can give satisfactory references in New York City as to his professional qualifications; and will therefore merely refer here to the fact of his having been engaged for upwards of two years conducting important Public Works for the British Government.

Communications will find Mr. Hewson at the office of the Railroad Journal, 54 Wall Street, New York.

Walter R. Johnson,

CIVIL AND MINING ENGINEER AND ATTORNEY for Patents. Office and Laboratory, F St., opposite the Patent office, Washington, D. C.

Cop Waste.

CLEAN COP WASTE, suitable for cleaning Railroad, Steamboat and Stationary Engines, constantly on hand and for sale by

KENNEDY & GELSTON,
54 Pine St., New York.

October 27, 1849,

3m

Ranstead, Dearborn & Co.,

MANUFACTURERS OF

LOCOMOTIVE CRANKS AND CAR AXLES.

ALSO

WROUGHT IRON SHAFTING,
And All Kinds of Hammered Shapes.

Forge at Commercial Point, Dorchester,
Office 25 Foster's Wharf, opposite No. 211 Broad St.
BOSTON.

IRON.

Iron.

Pig Iron, Anthracite and Charcoal; Boiler and Flue Iron, Spring and Blistered Steel, Nail Rods, Best Refined Bar Iron, Railroad Iron, Car Axles, Nails, Stove Castings, Cast Iron Pipes of all sizes, Railway Chairs of approved patterns for sale by
COLEMAN, KELTON & CAMPBELL,
109 N. Water St., Philadelphia.

IRONDALE PIG METAL, MANUFACTURED
and for sale by the Bloomsburg Railroad Iron Co.
DUDLEY FISHER, Treasurer.
75 N. Water St., Philadelphia.

Railroad Iron.

500 Tons, afloat, weighing 57 pounds per lineal yard, for sale by

COLLINS, VOSE & CO.,
159 South St.

New York, November 17, 1849.

1m46

Railroad Iron.

1675 Tons, weighing about 61 lbs. per yard, 90 tons, weighing about 52 lbs. per yard, and 825 tons, weighing about 54 lbs. per yard, of the latest and most approved patterns of T rail, for sale by
BOORMAN, JOHNSTON & CO.,
119 Greenwich street.

New York, Feb. 25, 1850.

N. B.—B. J. & Co are also prepared to take contracts for English rails, delivered in any of the Atlantic ports of the United States.

Railroad Iron.

THE UNDERSIGNED, HAVING made arrangements abroad, are prepared to contract for the delivery of Foreign rails, of approved brands upon the most favorable terms.

They will also make contracts for American rails, made at their Trenton works, from Andover Iron, in whole or in part, as may be agreed upon.

They are prepared to furnish Telegraph, Spring and Market Wire; Braziers and Wire Rods; Rivets and Merchant Bars to order, all made exclusively from Andover Iron. The attention of parties who require iron of the very best quality for special purposes, is respectfully invited.

COOPER & HEWITT,
17 Burling Slip, New York.

February 15, 1850.

Glendon Refined Iron.

Round Iron, Band Iron, Hoop Iron,
Square " Flat " Scroll "

Axles, Locomotive Tyres,

Manufactured at the Glendon Mills, East Boston, for sale by

GEORGE GARDNER & CO.,
5 Liberty Square, Boston, Mass.

Sept. 15, 1849.

3m37

PATENT HAMMERED RAILROAD, SHIP & BOAT SPIKES.—The Albany Iron Works have always on hand, of their own manufacture, a large assortment of Railroad, Ship and Boat Spikes from 2 to 12 inches in length, and of any form of head; From the excellence of the material always used in their manufacture, and their very general use for railroads and other purposes in this country, the manufacturers have no hesitation in warranting them fully equal to the best spikes in market, both as to quality and appearance. All orders addressed to the subscribers at the works will be promptly executed.

JOHN F. WINSLOW, Agent.

Albany Iron and Nail Works, Troy, N. Y.
The above Spikes may be had at factory prices, of Erastus Corning & Co Albany; Merrill & Co., New York; E. Pratt & Br. 1st, Eastmore Md

LAP—WELDED WROUGHT IRON TUBES

FOR

TUBULAR BOILERS,

FROM ONE AND A QUARTER TO SEVEN INCHES IN DIAMETER.

THE ONLY Tubes of the same quality and manufacture as those so extensively used in England, Scotland, France and Germany, for Locomotive, Marine and other Steam Engine Boilers.

THOMAS PROSSER & SON, Patentees,
28 Platt street, New York.

Railroad Iron.

THE UNDERSIGNED ARE PREPARED TO contract for the delivery of English Railroad Iron of favorite brands, during the Spring. They also receive orders for the importation of Pig, Bar, Sheet, etc. Iron.

THOMAS B. SANDS & CO.,
22 South William street,
New York.

February 3, 1849.

New York.

Iron Store.

THE Subscribers, having the selling agency of the following named Rolling Mills, viz: Norristown, Rough and Ready, Kensington, Triadelphia, Pottsgrove and Thorndale, can supply Railroad Companies, Merchants and others, at the wholesale mill prices for bars of all sizes, sheets cut to order as large as 58 in. diameter; Railroad Iron, domestic and foreign; Locomotive tire welded to given size; Chairs and Spikes; Iron for shafting, locomotive and general machinery purposes; Cast, Shear, Blister and Spring Steel; Boiler rivets; Copper; Pig iron, etc., etc.

MORRIS, JONES & CO.,

Iron Merchants,

Schuylkill 7th and Market Sts., Philadelphia.
August 16, 1849.

1y33

Railroad Iron.

THE MOUNT SAVAGE IRON WORKS, Alleghany county, Maryland, having recently passed into the hands of new proprietors, are now prepared, with increased facilities, to execute orders for any of the various patterns of Railroad Iron. Communications addressed to either of the subscribers will have prompt attention. J. F. WINSLOW, President

Troy, N. Y.

ERASTUS CORNING, Albany

WARREN DELANO, Jr., N. Y.

JOHN M. FORBES, Boston.

ENOCH PRATT, Baltimore, Md.

November 6, 1848.

Railroad Iron.

THE SUBSCRIBERS ARE PREPARED TO take orders for Railroad Iron to be made at their Phoenix Iron Works, situated on the Schuylkill River, near this city, and at their Safe Harbor Iron Works, situated in Lancaster County, on the Susquehanna river; which two establishments are now turning out upwards of 1800 tons of finished rails per month.

Companies desirous of contracting will be promptly supplied with rails of any required pattern, and of the very best quality.

REEVES, BUCK & CO.,

45 North Water St., Philadelphia.

March 15, 1849.

Monument Foundry.

A. & W. DENMAD & SON,
Corner of North and Monument Sts.,—Baltimore,
HAVING THEIR

IRON FOUNDRY AND MACHINE SHOP

In complete operation, are prepared to execute faithfully and promptly, orders for Locomotive or Stationary Steam Engines, Woolen, Cotton, Flour, Rice, Sugar Grist, or Saw Mills, Slide, Hand or Chuck Lathes, Machinery for cutting all kinds of Gearing, Hydraulic, Tobacco and other Presses, Car and Locomotive patent Ring Wheels, warranted, Bridge and Mill Castings of every description, Gas and Water Pipes of all sizes, warranted, Railroad Wheels with best fagotted axle, furnished and fitted up for use, complete. Being provided with Heavy Lathes for Boring and Turning Screws, Cylinders, etc., we can furnish them of any pitch, length or pattern.

Old Machinery Renewed or Repaired—and Estimates for Work in any part of the United States furnished at short notice.
June 8, 1849.

Iron Wire.

REFINED IRON WIRE OF ALL KINDS,
Card, Reed, Cotton-flyer, Annealed, Broom, Buckle, and Spring Wire. Also all kinds of Round, Flat or Oval Wire, best adapted to various machine purposes, annealed and tempered, straightened and cut any length, manufactured and sold by

ICHABOD WASHBURN.

Worcester, Mass., May 25, 1849.

American and Foreign Iron.**FOR SALE,**

300 Tons A-1, Iron Dale Foundry Iron.

100 "	1, "	"	"
100 "	2, "	"	"
100 "	"	"	"
100 "	"	Forge	"
400 "	"	Wilkesbarre	"
100 "	"	"Roaring Run" Foundry Iron.	"
300 "	"	Fort	"
50 "	"	Catoctin	"
250 "	"	Chikiswalungo	"
50 "	"	"Columbia" "chilling" iron, a very superior article for car wheels.	"
75 "	"	"Columbia" refined boiler blooms.	"
30 "	"	1 x 1/2 Slit Iron.	"
50 "	"	Best Penna. boiler iron.	"
50 "	"	"Puddled" "	"
50 "	"	Bagnall & Sons refined bar iron.	"
50 "	"	Common bar iron.	"

Locomotive and other boiler iron furnished to order.

GOODHUE & CO.,
64 South street

New York.

American Pig, Bloom and Boiler Iron.

HENRY THOMPSON & SON,
No 57 South Gay St., Baltimore, Md.

Offer for sale *Hot Blast* Charcoal Pig Iron made at the *Catoctin* (Maryland), and *Taylor* (Virginia), *Furnaces*; *Cold Blast* Charcoal Pig Iron from the *Cloverdale* and *Catauba*, Va., *Furnaces*, suitable for *Wheels* or *Machinery* requiring extra strength; also *Boiler* and *Flue* Iron from the mills of *Edge & Hilles* in Delaware, and best quality *Boiler Blooms* made from *Cold Blast* Pig Iron at the *Shenandoah Works*, Va. The productions of the above establishments can always be had at the lowest market prices for approved paper.

American Pig Iron of other brands, and *Rolled* and *Hammered* Bar Iron furnished at lowest prices. Agents for *Watson's* *Perth Amboy Fire Bricks*, and *Rich & Cos.* New York *Salamander* Iron Chests.
Baltimore, June 14, 1849. 6 mos

Wheel, Forge and Foundry Iron.

LOCUST GROVE Wheel Iron of great strength and superior chilling property.
Balt. Charcoal Forge Iron, from Patuxent, Curtis Creek and Gunpowder furnaces.

Elkridge Foundry Iron, of superior strength and softness. Anthracite and Charcoal Iron from Pennsylvania and Virginia. Gas and Water Pipes, Lamp Posts from Elkridge furnace.

LEMMON & GLENN,
62 Buchanan's Wharf, Baltimore.

6m9

Iron.

THE SUBSCRIBERS having resumed the agency of the New-Jersey Iron Company, are prepared to execute orders for the different kinds and sizes of Iron usually made at the works of the company, and offer for sale on advantageous terms.—

150 tons	No. 1 Boonton Foundry Pig Iron.
100 "	No. 2 do. do. do.
300 "	Nos. 2 & 3 Forge do. do.
100 "	No. 2 Glendon do. do.
140 "	Nos. 2 & 3 Lehigh Crane do do.
100 "	No. 1 Pompton Charcoal do.
100 "	New-Jersey Blooms
50 "	New-Jersey Fagotted Iron, for shafts
Best Bars,	1/2 to 4 inch by 1/2 to 1 inch thick.
Do do	Rounds and Squares, 1/2 to 3 inch.
Rounds and Squares,	3-16 to 1 inch.
Half Rounds,	1/2 to 1 in. Ovals & Half Ovals 1/2 to 1 1/2 in.
Bands,	1/2 to 4 inch. Hoops, 1/2 to 2 inch.
Trunk Hoops,	1/2 to 1 1/2 in. Horse Shoe & Nut Iron.
Nail Plates.	Railroad Spikes.

DUDLEY B. FULLER & Co., 139 Greenwich-st. and 65 Broad-st.

WILLIAM JESSOP & SONS' CELEBRATED CAST-STEEL.

The subscribers have on hand, and are constantly receiving from their manufactory,

PARK WORKS, SHEFFIELD,

Double Refined Cast Steel—square, flat and octagon. Best warranted Cast Steel—square, flat and octagon. Best double and single Shear Steel—warranted. Machinery Steel—round.

Best and 2d gy. Sheet Steel—for saws and other purposes.

German Steel—flat and square, "W. I. & S." "Eagle" and "Goat" stamps.

Genuine "Sykes," L. Blister Steel.

Best English Blister Steel, etc., etc., etc.

All of which are offered for sale on the most favorable terms by

WM. JESSOP & SONS,

91 John street, New York.

Also by their Agents—
Curtis & Hand, 47 Commerce street, Philadelphia.
Alex'r Fullerton & Co., 119 Milk street, Boston.
Stickney & Beatty, South Charles street, Baltimore.
May 6, 1848.

Ogden & Martin's ROSENDALE CEMENT.

WE are prepared to enter into arrangements for supplying our Cement for public works or other purposes. We warrant the cement equal in every respect to any manufactured in this country. It attains a great degree of hardness, sets immediately under water, and is a superior article for masonry coming in contact with water, or requiring great strength.

For sale in tight barrels, well papered, at their office by

OGDEN & MARTIN, 104 Wall st.

February 16, 1850. ly*

The above cement is used in most of the fortifications building by government.

JOHNSON, CAMMELL & Co's Celebrated Cast Steel,

AND

ENGINEERING AND MACHINE FILES,
which for quality and adaptation to mechanical uses, have been proved superior to any in the United States. Every description of square, octagon, flat and round cast steel, sheet, shovel and railway spring steel, best double and single shear steel, German steel, flat and square, goat stamps, etc. Saw and file steel, and steel to order for any purposes, manufactured at their Cyclops Steel Works Sheffield.

JOHNSON, CAMMELL & CO.,
100 William St., New York.

November 23 1849.

Railroad Iron.

1,500 Tons weighing 52 lbs. per lineal yard.

500 "	"	57 "	"
500 "	"	56 "	"
500 "	"	60 & 61 lbs.	"

Also 2 1/2 x 1/2 flat rails. All the above being of approved patterns. For sale by

DAVIS, BROOKS & CO.,
68 Broad street.

N.B.—Rails imported on commission, or at a fixed price.

CUT NAILS OF BEST QUALITY, BAR IRON
(including Flat Rails) manufactured and for sale by
FISHER, MORGAN & CO.,
76 N. Water St., Philadelphia.

Railroad Iron.

OF ANY PATTERN AND WEIGHT,
Of a Favorite Brand,
And deliverable in Bond, or Duty paid, at any Port of the U. S., contracted for on favorable terms, by
CHARLES ILLIUS,
20 Beaver St., New York.

Pig and other Iron also contracted for. Sole Agent for "Baxter's Machine and Burning Oil"—particularly adapted for "Railroads" and other Machinery. Preferred to Sperm by the many now using it, and 25 per cent. cheaper.

Railroad Iron.

THE Undersigned, Agents for Manufacturers, are prepared to contract to deliver Rails of superior quality, and of any size or pattern, to any ports of discharge in the United States.

COLLINS, VOSE & CO.,
158 South St.

New York, November 17, 1849.

To Steam Engine Builders.

THE Undersigned offer for sale, at less than half its cost, the following new machinery, calculated for an engine of 62 inches cylinder and 10 feet stroke, viz. 2 Wrought Iron Cranks, 60 inches from centre to centre.

1 Do. do.	Connecting Rod Strap.
2 Do. do.	Crank Pins.
1 Eccentric	Strap.
1 Diagonal Link	with Brasses.
1 Cast Iron Lever Beam	(forked).

The above machinery was made at the West Point Foundry for the U. S. Steamer Missouri, without regard to expense, is all finished complete for putting together, and has never been used. Drawings of the cranks can be seen on application to

HENRY THOMPSON & SON,
No. 57 South Gay St., Baltimore, Md.

Sept. 12, 1849.

Ballard's Improved JACK-SCREW.

PATENTED.

THE ADVANTAGES OF THIS Screw for Stone Quarries, Railroads, Steam Boiler Builders, and for other purposes are superior to any other similar machine.

The improvement consists in being able to use either end of the screw, as occasion requires.

It is capable of raising the heaviest Locomotive with ease, being portable, strong and powerful, and not likely to get out of order.

Many Railroad Companies and Boiler Makers have them in use—by whom they are highly recommended.

JACK SCREWS,
of various sizes, power and price, constantly on hand at the manufactory.

No. 7 Eldridge Street,
near Division Street.
New York, Jan. 19, 1850.

To Railroad Companies and Contractors.

FOR SALE.—Two Locomotive Engines and Tenders, at present in use on the Beaver Meadow Railroad, being too light for their coal trains, but well calculated for either gravel or light passenger trains.

They weigh, in running order, about 8 tons each—having one pair of driving wheels 4 feet diameter, 4 truck wheels 30 inches diameter, with cylinders 10 in. diameter, and 18 inches stroke of piston. Tenders on 4 wheels. Address

JAMES ROWLAND,
Pres't. Beaver Meadow Railroad & Coal Co.,
Philadelphia.

or, **L. CHAMBERLAIN, Sec'y,**
at Beaver Meadow, Pa.

May 19, 1849. 20tf

SPRING STEEL FOR LOCOMOTIVES, TENDERS AND CARS.—The subscriber is engaged in manufacturing spring steel from 1 1/2 to 6 inches in width, and of any thickness required: large quantities are yearly furnished for railroad purposes, and wherever used its quality has been approved of. The establishment being large, can execute orders with great promptitude, at reasonable prices, and the quality warranted. Address **J. F. WINSLOW, Agent,**
Albany Iron and Nail Works.



To Railroad Companies.

FOR SALE—A Second-hand Locomotive Engine and Tender, of about 10 tons weight, in good order, and warranted to perform well. Any company wanting a cheap engine for a passenger or light burden train, will rarely meet with an opportunity so favorable as the present. The engine and tender are in perfect running order, and will be tested to the satisfaction of any one wishing to purchase. Price \$1,500.

Address **J. B. MOORHEAD,**
Frazer P.O., Chester county, Pa.

P.S.—The Engine can be seen by calling on H. Osmond & Co., Car-builders, Broad st., Philadelphia.
September 6, 1849.

India-rubber for Railroad Cos.

RUBBER SPRINGS—Bearing and Buffer—Fuller's Patent—Hose from 1 to 12 inches diameter. Suction Hose. Steam Packing—from 1-16 to 2 in. thick. Rubber and Gutta Percha Bands. These articles are all warranted to give satisfaction, made under Tyer & Helm's patent, issued January, 1849.—No lead used in the composition. Will stand much higher heat than that called "Goodyear's," and is in all respects better than any in use. Proprietors of railroads do not be overcharged by pretenders.

HORACE H. DAY,

Warehouse 23 Courtlandt street.

New York, May 21, 1849.

Fire Brick.

THE Subscribers have constantly on hand Rufford's Stourbridge, Oak Farms Stourbridge, Lister, Wortley, Red and White Welsh Fire Bricks, common and fancy shapes. Also,

ROOFING SLATES,

from the best Welsh quarries, and of all sizes. Also,

COAL,

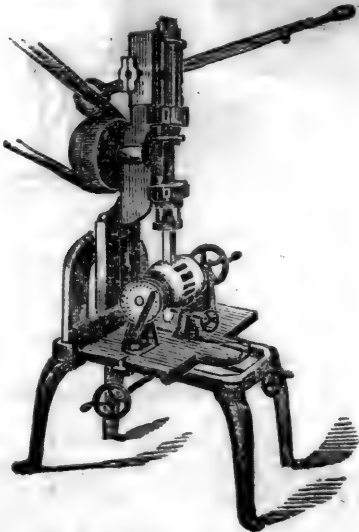
of all kinds—Liverpool Orrell and Cannel, Scotch, New Castle, Pictou, Sidney, Cumberland, Virginia, and all kinds of Anthracite coals. Also, Pig Iron, Salt, etc., etc., for sale at the lowest market price. Apply to

SAMUEL THOMPSON & NEPHEW,

275 Pearl and 43 Gold Sts., New York.

November, 23, 1849.

Capt. Alfred Swingle's PATENT BORING & MORTISING MACHINE.



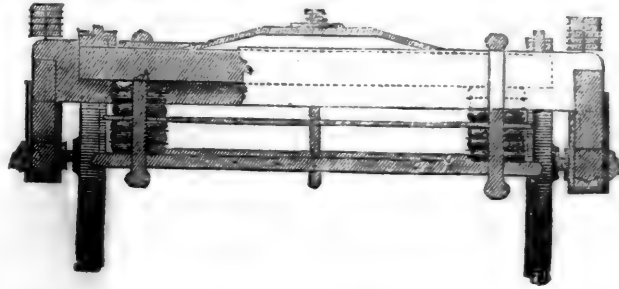
The above Machine was invented by A. SWINGLE, of Texas, in 1846, and Letters Patent were taken out in July, 1849. As a labor saving Machine it stands unrivalled even in these days of improvements. Its uses are innumerable; it may be successfully applied to Doors, Sashes, Carriages, Wheel-Hubs, and in fact to all kinds of work where the Auger and Chisel can be brought to bear.

The only limit to the speed of the working of this machine is the heating of the tools used. It will perform at least the labor of twelve men, and in vastly better manner, and can be worked equally well by steam power or by hand. It has been used and has given universal satisfaction.

For further information apply to H. B. THOMPSON, 40 Wall St., New York, to whom all orders are to be addressed.

New York, December 15, 1849.

FULLER'S PATENT INDIA RUBBER CAR SPRINGS.



RAILROAD COMPANIES are cautioned, before purchasing Springs, to examine the actual patents (and judge for themselves.)

Persons, under the Title of the New England Car Company, seeking fraudulently to invade Fuller's rights have put forth so many statements for the purpose of misleading the public, that an enumeration of some of them is absolutely necessary, for the purpose of putting persons interested upon their guard.

Fuller's patent is for the application of Discs of India-rubber with Metal Plates, for forming Springs for Railway Cars and Carriages—either one disc and two plates, or ten discs and plates, or any other number, are equally covered by the patent. Fuller is not bound to the use of short discs—he may use long discs and plates.

Ray's patent is simply and wholly the forming of air-tight rubber cylinders, with hoops or bands round the outside, and the combination of elasticity of India rubber, with the elasticity of atmospheric air confined in the cylinder, and in no part of his patent is he authorized to use the form of spring which he is now fraudulently supplying to Railroad Companies. Such springs are direct and positive infringements of the very letter of Fuller's patent.

Fuller's patent is dated October, 1845, Ray's patent, August, 1848.

The spring patented by Ray never has been put in operation, and never can be made useful for Railroad cars.

A mere experiment, even if made, it is well known does not prove an invention; and it is ridiculous for such parties to hope to mislead the Presidents and Superintendents of Railroad companies, by claiming the invention because Ray alleges he made an experiment—which Fuller had made before him—had actually brought into working order, and obtained a patent for—and this too before Mr. Ray states he made his experiment—and that experiment not claimed to have been applied to a car or carriage.

Besides, the invention could not have been developed until India rubber, properly Vulcanised, could be made of a sufficient thickness. In the United States the art of vulcanising rubber by steam heat, (by which

means only can a body of rubber having any considerable thickness be vulcanised,) was not introduced until after the grant by the American government of the patent for springs to Fuller—whereas the process of vulcanising rubber by steam heat was invented in England about three years previously, and was used by Fuller there. This fact refutes entirely the claim of invention put forth by Mr. Ray, and proves the impossibility of his pretensions being true.

Fuller was the first and only inventor of the spring. A Mr. Dorr, whose connection with Mr. Goodyear is well known in this country, applied in England to Mr. Fuller, after he had published and patented his invention, and introduced another party for the purpose of obtaining the agency for the United States. They were furnished with a complete set of drawings and models, and with instructions to make arrangements for the supply of material of American manufacture—from that hour to the present not a single communication has been received from them. Some of these identical models have been traced into the hands of parties now seeking to invade Fuller's rights, and who have exhibited them as specimens of their own invention.

After this, the conveyance was made by Goodyear to certain parties here for the use for railroad springs of what he calls his Metallic rubber. Comment is unnecessary.

There are 5 or 6 different processes for the manufacture of vulcanised rubber, patented by as many different parties, some here, some in England, either of which would probably make good springs.

A large and powerful company has been organized under Fuller's patent, the particulars of which shall be given hereafter.

An action has been commenced against three railroad companies for infringement; and all other parties will assuredly be prosecuted if they continue farther to infringe upon Fuller's patent.

W. C. FULLER,

The only persons authorised to supply the Springs are **G. M. KNEVITT**, 38 Broadway, N. York, General Agent for the U. S.; and **JAS. LEE & Co.**, 18 India Wharf, Boston. **JOHN THORNLEY**, Chestnut st., Philad.

Patent India Rubber Steam Packing.

THIS article, made by the subscriber, who alone is authorised to make it, is warranted to stand as high a degree of heat as any that has been or can be made by any person—and is the article which has made the reputation of India Rubber Steam Packing and the demand therefor. A large assortment of all thick nesses requisite for any description of engines, steam pipes, valves, etc., constantly on hand and for sale by the manufacturer and patentee, who will give every information regarding its properties, mode of use, etc. at the warehouse. **JOHN GREACHEN, JR.,**
98 Broadway, opposite Trinity Church.
New York, October, 1849.

Ibbotson, Brothers & Co's CELEBRATED CAST STEEL

AND

Best Cast Steel Royal Improved Files, well known as better adapted for Engineers' and Machinists' purposes than any now in use in the United States.

Every description of Square, Octagon, Flat and Round Cast Steel, Sheet, Shovel and Railway Spring Steel, etc., and Steel to order for any purposes—manufactured at their works in Sheffield—and universally known by the old stamp "Globe."

HENRY J. IBBOTSON, Agent,
218 Pearl st., New York.

February 25, 1860.

FAIRBANKS' RAILROAD SCALES.—THE subscribers are prepared to construct at short notice, Railroad and Depot Scales, of any desired length and capacity. Their long experience as manufacturers—their improvements in the construction of the various modifications, having reference to strength, durability, retention of adjustment, accuracy of weight and dispatch in weighing—and the long and severe tests to which their scales have been subjected—combine to ensure for these scales the universal confidence of the public.

No other scales are so extensively used upon railroads, either in the United States or Great Britain; and the managers refer with confidence to the following in the United States.

Eastern Railroad.	Boston & Maine Railroad.
Providence Railroad.	Providence and Wor. Road.
Western Railroad.	Concord Railroad.
Old Colony Railroad.	Fitchburg Railroad.
Schenectady Railroad.	Syracuse and Utica Road.
Balt. and Ohio Railroad.	Baltimore and Susq. Road.
Phila. & Reading Road.	Schuykill Valley Road.
Central (Ga.) Railroad.	Macon and Western Road.
New York and Erie Railroad.	

And other principal Railroads in the Western, Middle and Southern States.

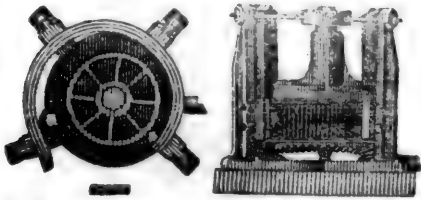
E. & F. FAIRBANKS & CO.

St. Johnsbury, Vt.

Agents, } **FAIRBANKS & Co.**, 81 Water St., N. York.
A. B. NORTON, 196 Market St. Philadelphia.
April 22, 1849. 1y*17

MACHINERY.

Henry Burden's Patent Revolving Shingling Machine.



THE Subscriber having recently purchased the right of this machine for the United States, now offers to make transfers of the right to run said machine, or sell to those who may be desirous to purchase the right for one or more of the States.

This machine is now in successful operation in ten or twelve iron works in and about the vicinity of Pittsburgh, also at Phoenixville and Reading, Pa., Covington Iron Works, Md., Troy Rolling Mills, and Troy Iron and Nail Factory, Troy, N. Y., where it has given universal satisfaction.

Its advantages over the ordinary Forge Hammer are numerous: considerable saving in first cost; saving in power; the entire saving of shingler's, or hammerman's wages, as no attendance whatever is necessary, it being entirely self-acting; saving in time from the quantity of work done, as one machine is capable of working the iron from sixty puddling furnaces; saving of waste, as nothing but the scoria is thrown off, and that most effectually; saving of staffs, as none are used or required. The time required to furnish a bloom being only about six seconds, the scoria has no time to set, consequently is got rid of much easier than when allowed to congeal as under the hammer. The iron being discharged from the machine so hot, rolls better and is much easier on the rollers and machinery. The bars roll sounder, and are much better finished. The subscriber feels confident that persons who will examine for themselves the machinery in operation, will find it possesses more advantages than have been enumerated. For further particulars address the subscriber at Troy, N. Y.

P. A. BURDEN.

Railroad Spikes and Wrought Iron Fastenings.

THE TROY IRON AND NAIL FACTORY, exclusive owner of all Henry Burden's Patented Machinery for making Spikes, have facilities for manufacturing large quantities upon short notice, and of a quality unsurpassed.

Wrought Iron Chairs, Clamps, Keys and Bolts for Railroad fastenings, also made to order. A full assortment of Ship and Boat Spikes always on hand.

All orders addressed to the Agent at the Factory will receive immediate attention.

P. A. BURDEN, Agent,
Troy Iron and Nail Factory, Troy, N. Y.

RAILROAD WHEELS.

CHILLED RAILROAD WHEELS.—THE UNDERSIGNED are now prepared to manufacture their Improved Corrugated Car Wheels, or Wheels with any form of spokes or discs, by a new process which prevents all strain on the metal, such as is produced in all other chilled wheels, by the manner of casting and cooling. By this new method of manufacture, the hubs of all kinds of wheels may be made whole—that is, without dividing them into sections—thus rendering the expense of banding unnecessary; and the wheels subjected to this process will be much stronger than those of the same size and weight, when made in the ordinary way.

A. WHITNEY & SON,
Willow St., below 13th,
Philadelphia, Pa.

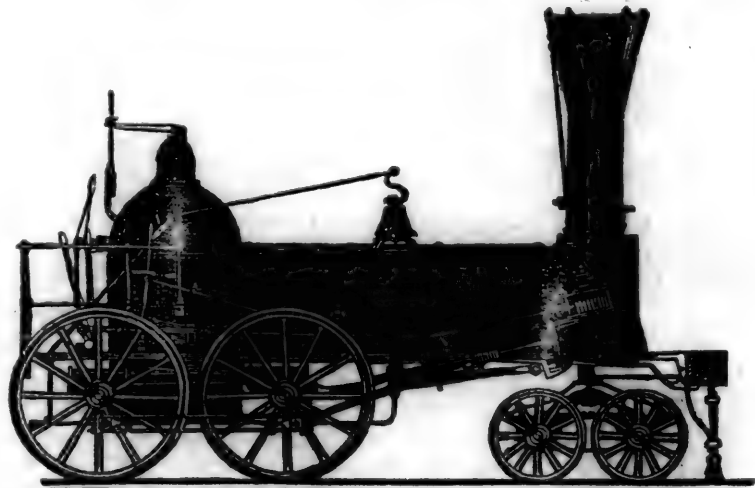
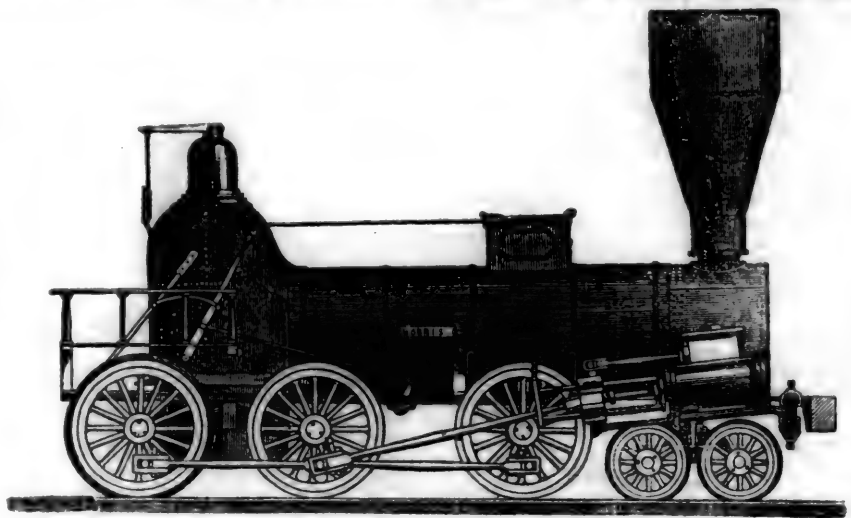
CHILLED RAILROAD WHEELS.—THE UNDERSIGNED, the Original Inventor of the Plate Wheel with solid hub, is prepared to execute all orders for the same, promptly and faithfully, and solicits a share of the patronage for those kind of wheels which are now so much preferred, and which he originally produced after a large expenditure of time and money.

A. TIERS,
Point Pleasant Foundry.

He also offers to furnish Rolling Mill Castings, and other Mill Gearing, with promptness, having, he believes, the largest stock of such patterns to be found in the country.

Kensington, Philadelphia Co., }
March 12, 1848. }

A. T.

NORRIS' LOCOMOTIVE WORKS.
BUSHHILL, SCHUYLKILL SIXTH-ST., PHILADELPHIA.

THE UNDERSIGNED Manufacture to order Locomotive Steam Engines of any plan or size. Their shops being enlarged, and their arrangements considerably extended to facilitate the speedy execution of work in this branch, they can offer to Railway Companies unusual advantages for prompt delivery of Machinery of superior workmanship and finish.

Connected with the Locomotive business, they are also prepared to furnish, at short notice, Chilled Wheels for Cars of superior quality.

Wrought Iron Tyres made of any required size—the exact diameter of the Wheel Centre, being given, the Tyres are made to fit on same without the necessity of turning out inside.

Iron and Brass castings, Axles, etc., fitted up complete with Trucks or otherwise.

NORRIS, BROTHERS

LAWRENCE'S ROSENDALE HYDRAULIC Cement. This Cement is warranted equal to any manufactured in this country, and has been pronounced superior to Francis' "Roman." Its value for Aqueducts, Locks, Bridges, Flooms, and all Masonry exposed to dampness, is well known, as it sets immediately under water, and increases in solidity for years. For sale in lots to suit purchasers, in tight papered barrels, by

JOHN W. LAWRENCE,
142 Front-street, New York.

Orders for the above will be received and promptly attended to at this office. 32 1y.

PATENT MACHINE MADE HORSE-SHOES.

The Troy Iron and Nail Factory have always on hand a general assortment of Horse Shoes, made from Refined American Iron.

Four sizes being made, it will be well for those ordering to remember that the size of the shoe increases as the numbers—No. 1 being the smallest.



P. A. BURDEN, Agent,
Troy Iron and Nail Factory, Troy, N. Y.

COLUMBUS, OHIO,
Railroad Car Manufactory.
RIDGWAYS & KIMBALL,

HAVE established at this central point, the manufacture of Passenger, Freight, Gravel and Hand Cars for Railroads, and assure all Western Railroad Companies that it will be their constant aim to procure the best materials and workmen, and to turn out the best kind of work at fair prices. Specimens may be seen on the Columbus and Xenia Railroad. The patronage of Railroad Companies is respectfully solicited. 1y8

To Inventors and Patentees.

OWEN G. WARREN, ARCHITECT, Has had many years' experience as Agent for obtaining Patents, both in this country and Europe, and will transact such business promptly and reasonably. Persons at a distance can have their business done by correspondence—without the necessity of visiting this city or Washington. Office No. 94 Merchants Exchange, Wall st., corner of Hanover st., up stairs. 1y3

AMERICAN RAILROAD JOURNAL.

STEAM NAVIGATION, COMMERCE, MINING, MANUFACTURES.

HENRY V. POOR, Editor.

ESTABLISHED 1831.

PUBLISHED WEEKLY, AT No. 136 NASSAU ST., NEW YORK, AT FIVE DOLLARS PER ANNUM IN ADVANCE.
SECOND QUARTO SERIES, VOL. VI., No. 16] SATURDAY, APRIL 20, 1850. [WHOLE No. 731, VOL. XXIII.

ASSISTANT EDITORS.

J. T. HODGE, *For Mining and Metallurgy.*
GEN. CHAS. T. JAMES, *For Manufactures and the Mechanic Arts.*
M. BUTT HEWSON, C. E., *For Civil Engineering.*

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American Railroad Journal.

PUBLISHED BY J. H. SCHULTZ & Co., 136 NASSAU ST.

Saturday, April 20, 1850.

Forges and Iron Ores of Northern New York.

The forges upon the Saranac, Salmon and Little Ausable rivers, are supplied with ores from various sources. To the works situated near the lake these are mostly brought by water—a considerable proportion of them from the mines near Port Henry, which have already been described in the account of the works at this locality, published in the last volume of the Journal. Of the mines found in the granitic tract up these streams, I have no particular account to give. Two of them, however, from their connection with the works at the new State prison, demand some notice. In the year 1844, a tract of land was purchased for the State for a prison, in which the convicts were to be employed in mining and working the iron ores found on the property. The locality selected was seventeen miles west of Plattsburg and three miles north of the Saranac river. Here was a mine of some note known as the *Sailly and Averill vein*, and near it were indications of another workable vein, called the *Skinner vein*. The latter was purchased and works established for the manufacture of iron.—The mine, however, proved to be valueless; and in 1848 an arrangement was made, by which the State has the use for ten years of the ore from the

Sailly and Averill vein. With this ore iron was made in the prison to considerable amount the last year; and I am informed arrangements are in progress for adding to the other operations of the convicts the conversion of a portion of the iron into cast steel. Prof. Emmons makes mention of this vein in his State Geological Report. The ore from it he says is "fine-grained and intermixed with greenish matter which appears to be pyroxene. It contains some sulphuret of iron, and about one-third of its weight of earthy matter. Its matrix is a red-coarse granite, in which large crystals or masses of feldspar are quite common." This account does not seem to be of a very valuable ore, such as would lead a judicious iron man to invest a large amount of money in works to be wholly dependent upon it; still in the deficiency of better ores, it may serve to keep the prison works and its inmates in useful if not profitable occupation.—The locality is rather remote from the lake; and at the time of the establishment of the prison the expenses of transportation must have seriously lessened the profits of the manufacture. A plank road has, however, been lately built from Plattsburg up the valley of the Saranac, passing within five miles of the prison; and a branch is likely soon to be added, completing the connection of the works with the lake.

The principal mines of this region are on the hills near the Ausable river. It is in the valley of this river that the principal forges for their reduction are also found. I shall not undertake to describe each of these mines, an account of which may be found in Prof. Emmons' State Report, before referred to. I examined the most of them in the year 1844; since that time no new mines of any great consequence have been discovered, that I am aware of, and the *Arnold*, *Palmer*, *Cook* and *Winter* veins still continue, as they were then, the principal sources whence the great body of the ores is obtained.

The last named, owned by the Peru Iron Company, is situated within a mile of their works at Clintonville, on a high hill lying to the northeast of the village. This mine presents some curious features. The ore was first found on the surface in a solid layer a few feet thick, about a hundred feet in length and forty feet in width. Its course was north about 10° west, south 10° east. When this layer was removed, the whole deposit seemed to be exhausted. Beneath was seen only a band of

very lean ore hardly distinguishable from the rock which included it. This was traced in the same direction with the main mass above, viz: north and south, and its inclination was toward the east, but little out of the vertical. On the course of its length also this band of ore dipped under the granite rock towards the north, leaving no trace in the rock at the surface. From its leanness, not from the failure of the ore, its exploration was soon abandoned. Subsequently, however, no less than six other parallel veins have been found and partially wrought within 175 feet. All have the same easterly dip, (unless the western one inclined westerly) and all present the same general features, though the qualities of the ore somewhat varied. They had been traced in 1844 no less than 200 feet on their course. In different spots they yielded abundant ore to pay the expenses of mining, but these richer portions would soon fail, and give place to lean ores small in quantity. When, however, these were worked through, rich spots would again be found. These features of irregular distribution, and yet of continuity of deposit, are common to all true veins. Not one of them has been wholly worked out.

These veins are crossed by dykes of greenstone, which though they seem to disturb them but little, yet from their common occurrence in connections with the veins of iron in this vicinity seem to have some unknown relation to them, and no doubt important influence upon their productiveness. In this instance no less than fourteen of these dykes, parallel in direction, and only a few feet in thickness, have been found cutting through the veins of ore nearly at right angles. The dykes must therefore have been formed subsequently to the vein fissures. Being less compact than the solid granite, they afford great facility for running cross cuts from vein to vein, or adit levels for entrances or drains.

I have no particular accounts of the production of these veins since the year 1844. I was then employed to examine them, and recommended the construction of an adit running in a westerly direction to cut all the veins. Could this be done at the lowest level, which is near the works of the company, an entrance could be had some 300 feet below the point where the veins are now worked, and the ore be run out on a level to the works.—The length, however, of such an adit will probably long prevent its construction, though the prospect

of cutting other veins than those now known might add some inducement for incurring the expense.

The Cook veins lie on a range of hills next west of the range containing the Winter veins. They are four in number, parallel to each other and very near together; their course about north and south. One is no less than thirteen feet thick, the rest make up about eleven feet more. The deposit has been traced by ore scattered in the surface of the rock for a mile and a half; and has been opened in several places on its range. The ore was highly esteemed, though it was not so free of gangue as the Arnold ore. It contains more protoxide and less peroxide of iron than the Arnold ore, and is decidedly magnetic.

The next range of hills west contains the Arnold veins. Of these also there are four, found on the face of a high hill, parallel to each other, and separated by only a few feet of rock. The following account of these is by Prof. Simmons, (see State Geological Report, p. 291.) "It appears that the vein which was first opened was the richest, and gave in the first place celebrity to the ore. This became known as the Old Blue vein, and probably from its purity and value has been of great use in giving an impulse to the manufacture of iron in this vicinity; and so high does this ore stand in market, that the veins are leased at the rate of six thousand dollars per year.

The four veins are nearly if not quite parallel, but differ in width; the old blue vein varies from two to eight feet. It is readily distinguished by the eye from the other veins, being always of a bluish tinge, and very frequently iridescent with purple hues. Its streak or powder is red; a fact which shows the state of oxidation. This vein has been worked to the depth of 260 feet, and in length about 80 rods. It course is north north-east, dip 70° west north-west.

The Arnold ores are easy to reduce; the iron is tough and soft, and is very much employed for nails, and all those articles where tenacity is required, and where softness is not an objectionable character. * * This iron was at one time manufactured into cables; but for some cause it was acted upon by sea water more than the English cables, and hence became less saleable, when the business was abandoned.

In the progress of working the veins several dykes have been encountered which cross them at various angles; and in one instance where the dyke is oblique to the direction of the vein, it has produced a shift; that is, the portion included by the dykes has been carried the width of the vein to the east. Those dykes which cross the veins at right angles, have produced no change or shift; while those which are oblique, have carried the veins several feet to the east."

The other veins are called—one, from the darker color of the ore, the black vein, and two, from an admixture of quartz, which gives them a light appearance, the grey veins. The first is from three to eleven feet thick; the other two from two to eight feet. All are highly charged with the peroxide of iron; the old blue vein has the greatest proportion apparently, and is the most esteemed.—This is so pure that the ore obtained from the deep workings is used in the forge fires without undergoing the separating process.

The Palmer vein is on still another range of hills west of those which contain the preceding veins. The ore occurs on both sides of a large vertical dyke of greenstone which is ten feet thick, and makes with the vein an acute angle. On the east

side the ore was disseminated through the rock in the manner of a *Stocwerk*; sometimes in quantity sufficient to pay expenses of mining, and sometimes not. Other dykes of greenstone were here found passing obliquely into the main dyke. After some years of explorations on the east side, the great dyke was penetrated, and a large body of ore found on its west side. It did not come up to its surface, and so its presence had not been suspected. It lies against the dyke on one side, separating easily from it, and on the other cleaves to the west wall. This body of ore was found at one time no less than 35 feet thick. The workings, however, now carried to the depth of 250 feet, are seldom more than 20 feet in width; and sometimes the vein thins away to two feet. The dip of the vein is about 45°. The ore is highly esteemed for mixing with the richer Arnold ore. It contains considerable quartz from which it requires to be separated, and it has a larger proportion of the protoxide of iron and less of the peroxide than the Arnold ore.

These veins and a few others of less note have long supplied the forges of this vicinity. In a distance of sixteen miles on the valley of the Anusable there are no less than 58 forge fires, 50 of which were in operation a part at least of the last winter. The works are probably as extensive as the present facilities for procuring fuel will justify; but the amount of ore must be regarded as inexhaustible. Prof. Emmons estimates the whole width of the veins known in the district in 1839, leaving out the Winter veins, as not less than 136 feet. As explorations are continued from year to year, there is no doubt other valuable veins will hereafter be brought to light, which are now concealed beneath the superficial covering of the rocks or the granite cap itself. These insure to the region a permanent occupation in the manufacture of iron, for increased facilities of transportation will render available forests now remote, and even the anthracite of Pennsylvania may be in time profitably employed in the reduction of the ores. This fuel has already been brought to the blast furnaces at Port Henry for trying this experiment.

The next article upon this subject will be an account of the forges and the process of working them.

H.

Railway Progress.

Continued from page 241.

1. The tubular bridges of Mr. Robert Stevenson, as exemplified in the Conway and Britannia.
2. The double bridges of cast-iron framework by Mr. Robert Stevenson spanning the Tyne, under the name of the high level.
3. The bow-string bridges of Mr. Joseph Locke, spanning the Regent's Canal and Commercial-road on the Blackwall Extension railway, built by Fox, Henderson, and Co.
4. The triangular frame bridge of Captain Warren, of which samples may be seen on the Guildford and Reigate railway, and crossing Tooley street.

The Chester and Holyhead railway required a bridge via the Menai Straits—a piece of salt water subject to the "Droits of the Admiralty." For the passage of heavy trains a strong and rigid bridge was required, and Mr. Stephenson designed one of cast iron, in two spans of 450 feet each, which we regret was impeded in the execution by the *gaucherie* of the Admiralty; for it would have been a structure of great beauty and of permanent durability with little need of repair. Possibly, the Admiralty cared little to have a bridge made at all, upholding water locomotion in preference to land, and sailing vessels to steamers. But anyhow, they pronounced their fiat, without appeal, that no bridge should be erected which did not leave a clear treadway through the whole length, of one hundred feet

above high water mark. "And then to breakfast with what appetite you have."

But to return to our "muttons"—the Admiralty, the sheepish body who follow in old tracks and eschew new ones, their very name a misnomer.—Overseers! lookers-on! examiners! Overlookers, indeed, they might be called in one sense, since they cannot see what is palpable to all the world besides. We remember a case in which an inventor submitted to them a child of his brain. In due time he received a letter from the secretary, saying that "My lords did not think his plan would answer."—"Who are these lords, and what is their capacity for judging?" answered the poor man.—He hunted the origin of the opinion till he tracked it downwards to the most imbecile authority, that ever twaddled in mechanical engineering.

Such were the men who deemed they had set Robert Stephenson a problem beyond his art, to carry railway trains 450 feet through the air without centres or scaffolds whereon to build his bridge. In answer thereto he said, "Let there be a tunnel formed of boiler plates riveted together—a tube or pipe of sufficient diameter to bear the locomotive with all its load." This conception countersigned by his directors, Mr. Stephenson summoned around him the practical and scientific men, fitted to verify his plan in detail—Mr. Fairbairn, Mr. Clarke and Mr. Hodgkinson. Mr. Stephenson's first idea was a hollow tube, circular in form. Numerous experiments were tried on this form of tube, but, as might be expected, all were failures, by the tubes collapsing; and this led to other experiments, ending in tubes of an oblong section, with rows of cells of a square form at the top and bottom, to supply the strength to resist tension and compression. But after examining the drawings given in Mr. Fairbairn's book, we are of opinion that the cylindrical tubes have not had justice done to them, and that had the same arrangements for stiffening been used, to which the oblong form tubes owe their strength, a very different result would have been obtained. The circular tubes were of thin iron, badly connected. Had they been reinforced internally with edge rings like the internal diaphragms of a bamboo cane; or externally providing also a longitudinal rib, top and bottom, no collapse would have taken place, and we think a better form of tube would have been obtained. So far we think Mr. Stephenson's original conception has not been done justice to. One very serious objection to the top and bottom cells, to the originality of which Mr. Fairbairn lays claim, is the difficulty of continuous examination to guard against the effects of rust, which must sooner or later take place unless they be hermetically sealed, or kept painted, owing to the salt atmosphere. Twenty-eight horizontal flues, twenty inches square and fifteen hundred feet long each, and rough inside with angle iron, are not easy things for an engineer to examine. Had Mr. Stephenson's circular tubes been fairly strengthened, this difficulty would have been avoided, and the external form would have been better adapted to elude the force of the wind. The vertical plates of the square tubes would not maintain their form but for the mass of T iron with which they are ribbed, and had the circular tubes been ribbed, they also would have maintained their form, whether the ribs have been inside or out.

To conclude this part of our remarks, we could wish that Mr. Stephenson's original design of a massive and permanent cast iron bridge had been carried into effect; and in default of that, his circular tube, properly ribbed, and accessible at all portions to keep in repair and paint, a question which in all wrought iron structures must be carefully attended to at a great annual expense. But, taking it altogether, it is a giant thought, wrought out in a giant's work as a forerunner of greater things yet to come, a veritable production of a thorough English mind, regarding physical difficulties only as so many dams, against which energy may gather and heap itself up, till it bears down all opposition before it.

Our day dream is—six hours from London to Holyhead—then in an iron-screw steamer, double the size of the Great Britain, "ruling the waves straight," and bidding sea sickness avaunt—two hours to Kingston—then four hours by rail to Galway, the leaping-off place for the west—then, in another giant steamer, six days to New York—

London to New York in a week! What say ye, educators of the people, rulers of the state? With Ireland for a main trunk line and America for a terminus, how long will it be ere one link binds together the hearts of all nations speaking the language of Shakspeare and Milton? Above all things let us have a steamer—a floating bridge that may annihilate the channel between Holyhead and Kingston. The one thing needed is, great size to ensure swiftness, and stay the vertical heaving of Celtic diaphrams.

The bridges of the Stepney extension are hollow iron box girders, made of boiler plates riveted together similarly to the Britannia and Conway.—But they are not straight girders. The boxes are about 18 inches square in section, and they are constructed in a curved form, like a large bow, of the same sectional size throughout. To prevent this arch from flattening when the load is on it, the ends are made to abut on horizontal tie-rods of proportional strength. On those tie-rods the road is carried, vertical rods being attached between the tie-rod and the bow, as in an ordinary suspension bridge, and diagonal braces are fixed so as to prevent oscillation. Thus the suspension being effected from a rigid arch, instead of a loose chain, a bridge is produced sufficiently rigid for railway trains, together with great lightness. What we have described is the structure of a bridge rib—two such ribs constituting the bridge to carry two lines of rails. The principle, in fact, is that of a roof-truss in an arched form, combining the principles of compression in the upper portion, and tension in the lower, as in an ordinary girder. The bridge which is erected over the Regent's Canal has a span of 117 feet. It is 27 feet wide, and the versed sine from rib to tie bar is eight feet. The total weight is 194 tons. These girders have been proved to a weight of two tons per foot run. As regards the power of resistance in the arch, we see no difficulty in carrying that to any amount, by making such ribs lie vertically one on top of the other, precisely as the Americans make timber arches of planks laid one on the other, like brickwork rings of our railway bridges. But for great spans we see a difficulty. It would scarcely be possible to maintain steadiness vertically, without connecting the ribs together by tie-bars at the top, boxing them as it were together, and perhaps increasing the width of the roadway. Beyond this, there still remains the difficulty as to how long such box girders will last. If they now be hermetically sealed, so that wet cannot penetrate the interior, we should entertain little doubt; but it is probable that, in future constructions, the plates will be effectually galvanized, to render them very durable.

The last kind of bridge we have to notice is that of Captain Warren, erected over the Guildford and Reigate Junction, and also in Tooley street, by the engineer of the Southeastern railway company.—The principle of this bridge is a horizontal tension bar or chain, which is rendered stiff by the application thereon of a number of triangular frames of cast iron. The lower points are attached to the tension-rod, and the upper ones abut together in a parallel line with a lower rod. By inserting small wedges between the abutting ends of the triangles, any amount of camber may be given to the bridge after erection, to compensate for irregularities or extra load, so as to preserve the horizontal level, or make the centre rise. It is evident that, as in an ordinary suspension chain, the whole strength of this bridge depends on the tension rods or chains—the end pressure of the angular frames merely serves to give horizontal stability and abutment. The bridge may be regarded as an ordinary girder, formed of open work, removing the portions near the neutral axes which yield little strength.

Having thus far "bridged" our way, we now may turn to the consideration of the "way" itself, and the uses to which it is mechanically applied. Years ago we called public attention to this subject, both in these pages and in those of the railway press; but at the time, our remarks received scarcely any attention, for railways were in their hey day, and sundry not very sound maxims were received as orthodox, such as weight is no object on railways—weight is speed—wear and tear are practically nil—rails will last thirty years—rolling stock an indefinite period—and so on. The errors since persisted in were not wholly without warn-

ing. A voice was lifted up against them, unregarded amidst the din of cupidity, that defeated its own proposed object—gain.

THE RATIONALE OF ECONOMICAL TRACTION ON RAILWAYS.

The general principle that should govern the construction of railways in no wise differ from those of highways. They are both roads to bear rolling wheels, composed of a wearing surface and a substructure; in one case a surface of stone over the whole substructure, for the wheels to travel over all parts; in the other case, a narrow surface of iron fixed to timber or stone blocks forming the substructure, the wheels being trammelled to run on the iron surface.

On the highway the strength of the surface and substructure is usually estimated by the load which horses are capable of drawing; but to prevent the crushing of the surface, the wheels are increased in breadth in proportion to the load: and to produce voluntary compliance with this essential condition, the tolls on highways are lessened in proportion to the increased breadth of the tyres or tread on the road. There are, of course, limits to this, and the usual practical limit is what four horses can draw. Even with that limited weight, it was found that the abraiding surface beneath the wheels and the horses' feet was so serious an evil, by producing increased resistance, that hard iron rails with a narrow surface were substituted for the broad surface of yielding stone, and thus grew up the railway system.

But iron is not indefinitely hard, or substructure indefinitely durable; and these two facts were thoroughly appreciated by the directors of the Liverpool and Manchester railway when, in offering a premium for the best locomotive engine, they specified the maximum weight to be under five tons.

But they did not at the same time specify a maximum of speed because, at that time, speed was not imagined. Even passengers were not imagined.

Running trains commenced, and passengers increased; carriage after carriage was added, for steam did not break its wind, did not die on the spot, as horses would have done. The result was, a lessened speed from increased load. But speed must be had at any cost, and the power and weight of the engines were increased. Again more carriages were added, and again were the engines increased. Then began the struggle for speed between the broad and narrow gauge, till the rails and substructure gave way, and shareholders awakened to the conviction, that in six years they had worn out the fixed plant that was to have lasted thirty, and had also worn out—their dividends.

There is no doubt that speed is a useful thing, if it can be attained without too high a cost; and there is but little doubt that speed may be maintained without excessive cost. But to accomplish this, the managers of railways must take example from the practice of the highways. There, the fast coach was the light coach—heavy conveyances travelled slowly. On railways this practice has been reversed. The heavier the engine the faster the speed—as though weight and speed were synonymous, and not the contrary. The whole present system is confined in a vicious circle, from which there is no escape but by remodelling.

The rate of travelling must in all cases be more costly as excess of speed is attained; but we must not lose sight of the fact, that a light well constructed train, with a specific number of passengers, can travel at forty miles per hour at less cost than a heavily badly constructed train at twenty. And an engine of ten tons weight can attain as great speed as the largest engine that ever was constructed, and in most cases greater speed, precisely as the light Arab horse can outstrip the elephant, whose feet sink into the ground—precisely as rails sink beneath the tread of our monster engine.

To obtain the maximum of results on railways, it is essential, before all things, to ascertain the proportion of weight on the wheels of the rolling stock that the rails and substructure can sustain at the maximum speed, without crushing; for, the heavier the load, the less in proportion must be the speed. It is quite true that the greater the speed the less is the vertical weight while running, but so much greater is the impinging force laterally

and longitudinally, and proportionably greater will be the amount of destruction.

It must be evident that all surplus weight in rolling stock is an unnecessary evil, carrying about lumber without profit; and the longer and heavier the train, the greater is the proportionate weight. The mere arrangement of springs to provide against longitudinal concussion amounts to half a ton per vehicle. The enormous disproportion of dead-weight to load that has obtained on railways may be gathered from the facts, that the light stagecoach weighed seventeen cwt. and carried nineteen persons including guard and driver, while the first class carriage on a railway weighs four tons and carries eighteen passengers only. The risk of longitudinally collision caused by long trains is the reason of this disproportion.

This surplus weight involves another difficulty. To start a train into motion requires many times the power needed to keep up speed when once attained, supposing the road to be level, and in good order. To check the momentum thus acquired, in case of an impending collision, or when stopping at a station, requires a corresponding amount of power, by using breaks, or by reversing the steam. All this is positive waste, and the more frequent the stopping the greater must be the amount of waste.

There are two ways of considering the question of traction; mechanically and commercially. A thing may be mechanically practical which is commercially unadvisable.

Mechanically. First, the rails should be so hard as to resist abrasion on the surface in contact with the wheels; and so stiff, vertically and laterally, as to be incapable of deflection by weight or concussion of the passing load. And, moreover, the joints should be so formed that the rails at their abutment should be as free from deflection as at any portion of their mid length, precisely as a fishing rod is as strong at the ferule-joint as at any other portion.

Secondly. The substructure should be so firm, that no amount of rolling load can displace the sleepers, or crush them down so as to require "maintenance of way."

[Foreign Correspondence of the Railroad Journal.]

Rome—Papal States—Political Condition, etc.

ROME, February 5, 1850.

Rome, clustering with the memories of more than 20 centuries, and abounding in monuments of her former magnificence, is for the traveller one of the choice spots of the globe. Amid the remains of her palaces and temples, upon the walls of the Coliseum, or beneath the dome of the Pantheon he finds himself in the presence of ruins that speak of her best days—that carry him back to the time of the Caesars, when "Rome sat upon her seven hills, and from her throne of beauty ruled the world." The contemplation of these grand moments of the past cannot fail to awaken a flood of interesting associations, and to excite profound emotion. Rome has also much of present beauty and excellence to claim attention. The Church of St. Peter, the statue of Apollo Belvidere, and Raphael's painting of the Transfiguration of Christ, are the master-pieces of the world in their respective arts. Besides these, sculptures and paintings innumerable, many by the first masters, throng the galleries of the Vatican, the churches and the halls of palaces.

But while this ancient and once mighty city teems with interest and delight to the stranger, it is far from being a paradise for its own inhabitants. They are oppressed, poor and discontented. For a government they have the anomaly of an absolute elective despotism, and the blighting influence of its policy is every where apparent. Possessing a climate equal to any in Italy, and a soil of quite average fertility, the Papal States present almost the desolation of a desert. Here and there, it is true, one sees a herd of fine grizzly oxen—a flock of sheep or goats attended by a shepherd dressed in skins, a fine field of grain and a decent stone farm

house, but they are exceptions, and in pleasing contrast to the general want of thrift.

The dominions of the pope contain 13,000 Italian square miles, and a population little short of 2,800,000.

Enterprise being quite equivalent to heresy, such a thing as a railroad does not exist. One was indeed contemplated to connect this city with Naples, pursuing nearly the route of the ancient Appian way, and some 8 or 10 miles of it were graded, but the government fearing, it is said, the republican tendency of railroads, long since discontinued operations. Perhaps the lack of money had quite as much to do with its abandonment as political reasons; but be it the one or the other, Rome, which was the pioneer in facilitating intercommunication by the construction of that magnificent highway, the "via Appia," portions of which are still to be seen at Pompeii, Pozznoli, and here near St. Sebastian's gate, is likely to be last in the enjoyment of that wonder worker of modern times—the railroad. In the canal or magnetic telegraph she or her rulers take no part.

I have not, even with the efficient aid of Mr. Piale, the owner of a library in place d'Espagne, whose acquaintance every stranger in Rome should make, been able to get any very satisfactory data as to the commerce of the Papal States. It must, however, be very inconsiderable, as one would naturally infer from the illiberal policy of the government, and it is chiefly carried on through Anconer, the principal port of the States in the Adriatic. The number of vessels belonging to the Papal States, exclusive of fishing smacks, may safely, perhaps, be put down as not exceeding one hundred—and of an aggregate tonnage not exceeding eight thousand tons. The chief articles of export are alum, rice, paper, oil, sheepskins, potash, oak bark and ship timber—imports are fish, and cotton goods in considerable quantities.

The principal manufactures are paper at Faligno, chiefly sent to the Levant and S. America; violin strings, mosaics and Roman pearl at Rome; macaroni at Bologna and Ancona, together with some articles of taste.

The revenue according to a recent estimate amounts to \$8,602,500 annually. The expense of collecting it \$2,043,500, leaving for a net revenue \$6,559,000. Of this sum the Holy See derives \$1,017,505 from lotteries, and expend \$1,451,498 for military force. The total expenses of government according to Dr. Bowerings report on Italian statistics, exceeds the net revenue by \$779,984, being \$7,338,924. The consolidated debt prior to the recent troubles amon't. to about \$30,000,000 and must now amount at least to \$35,000,000. The Papal finances are not therefore in a flattering condition, and to add to the evils of a bankrupt treasury, the paper currency (the only money now in circulation) has depreciated 35 per cent.

The present political condition of Popedom is unhappy indeed, and what the end will be no one can foretell.

Pope Pius IX., unless his looks belie his character, unless he has succeeded in giving an entirely false impression of himself to the mass of the people, is really a kind hearted man, and would willingly make almost any sacrifice to improve the condition of his subjects. But unfortunately his head is not so good as his heart. He is a weak man, and is surrounded by cardinals to whom any good epithet would be misapplied. On his election to the papal chair, Pius IX. immediately com-

menced reforms which had long but vainly been demanded by the people from his predecessors.—One of these measures was the granting a representative assembly, to share with him the temporal government of his dominions. This assembly on coming together proposed a list of names for officers of the cabinet, which the Pope accepted and confirmed. The leading genius of this ministry was Mezzino, in the office of Secretary of State, a man of masterly ability, and a thorough republican whose manly and eloquent address subsequently as a Trimevir of the Republic, to the French, every one will remember:

But with a government thus constituted the people are not content. They demand a written constitution. The cardinals oppose. Both parties become excited, and the Pope bewildered and disgusted flies from Rome, leaving the government in the hands of the ministry and assembly. Twice or thrice delegates are sent to beseech the grant of a constitution and his return to Rome, but they get no hearing. In this exigency the legislative assembly decrees its own dissolution, and the election, by universal suffrage, of a constituent assembly, to take into consideration the state of affairs.—The constituent assembly is decreed by a larger vote in proportion than that of France. It comes together, and after deliberation proclaims a republic, with a Trimvirate, at the head of which it places Mezzino, previously the minister of state under the Pope.

The republic is moving on finely, when suddenly the French appear, and after much fighting, in which the Romans under Garibaldi show prodigies of valor, they gain possession of the city with the loss of 12,000 men to themselves and 4,000 to the Romans. The principal members of the republican government escape to Geneva, and the Pope delegates three cardinals to administer the government, and under whose management it has since continued. Never were there greater tyrants than have been these three cardinals. To exterminate every vestige of republicanism has been their object, and most industriously have they labored to accomplish it. Thousands have been arrested and thrown into prison, and thousands more have escaped only by flight, with English or American passports. The work is still pursued with unabated vigor. A person utters an important remark in the evening, and before the morning he is hurried off to the inquisition. A few evenings since a woman performed some religious rite for a relative who fell in defence of the city, and being reported by her servant, was within two hours in the hands of the inquisition. On the night of the 2d instant more than 200 persons were brought from various parts of popedom to the Palace of the Quirinal and thence taken by the Swiss Guard to the prisons of the inquisition. An American was arrested, but on the interference of our Charge, Mr. Cass, they pleaded mistake as an excuse, and immediately set him at liberty, and made ample remuneration for injuries sustained. It was only last week one of the best and most influential of the nobility of Rome had notice that he must leave the country within 48 hours, or pay a fine of \$31,000. He declined doing either, but replied that they might take him, well knowing the government would not dare do it for fear of the people. The affair was finally settled by his paying \$7,000. The charge against him was, that his nephew wore a republican hat during the siege of the city by the French.

Yesterday (4th instant) the landlord of the Hotel d'Angleterre left the country, having previously re-

ceived notice to leave within 48 hours. Charge—utterance of republican sentiments. Almost every third man is a spy. Arrests are usually made in the dead of the night, and the person hurried off without any form of trial, or knowing who is his accuser. This is the second day of the great festival of the carnival, but it is far from being as usual a merry time for Rome. The priests and the French strive to make the most of it, but the Romans make it a point to take no part in it. Anonymous letters were a few days since sent to the principal men here to refrain from participating in the festivities on pain of assassination. It was contemplated having a funeral oration on the first day of carnival, for those who fell in defence of the city, but it coming to the ears of government, a veto was put upon it. Yesterday, however, a notice appeared at the corner of the streets advising Romans not to take part in the carnival, but rather go to the gate where the principal contest took place, and shed tears for those who fell in defence of the liberties of Rome, and in the afternoon more than 50,000 people were there assembled.

These facts will give some idea of the manner in which the government is administered, and which has inspired a hatred towards those who administer it, as deep seated and bitter as their character and conduct merits. The French are regarded with hardly less animosity, though, aside from the purpose of their coming, they have merited great praise for refraining from every species of impropriety. They do not deserve, and probably do not expect, much friendship from the Romans, but they have a right certainly to the kind regards of the priests and cardinals whom they reinstated in power. They have, however, received not the slightest evidence of this; but on the contrary have been most shabbily treated by them, and in revenge for this, it is said they are now holding little coteries, and preaching republicanism. This fact becoming known within the past week to the government, has created quite an alarm.

Add to these the fact that the republican government (which is really the government de jure, and so considers itself) is holding its session at Geneva, and there issues its decrees—that this government has solemnly charged the Pope with treason to his country—1st for deserting the government of his own making—2d for refusing all intercourse with it, and finally for bringing foreign troops to fight against and oppress his own people—that it has formally tried him upon the charge, found him guilty, and passed sentence of death upon him, which sentence it is said more than a hundred persons here have taken a solemn oath to execute in case he returns, and you have data that may give some idea of the singularly mixed and unsettled state of affairs here at the present time; but if from them you are able to foreshadow coming events, I confess you are the better prophet. If the French were to leave and any thing were to occur that would prevent Austria from pushing her troops here, as she has into most other Italian cities, right sure I am that hardly a fortnight would elapse before the republican government would be reinstated, and instead of the priests and cardinals being allowed quietly and unharmed to escape to Naples as before, their heads would fly like those of chickens and turkeys, the week before thanksgiving in New England. Almost everywhere during the recent revolutions the people manifested the greatest moderation. They spared the lives of their most inveterate enemies. They are now paying

for their leniency by the lives of their best friends. They are learning a lesson which will teach them in the next uprising (as it is sure to come sooner or later,) not to leave little stocks for combined foreign legitimists to reinstate. They will make a clean sweep.

Railway Economy.

COST OF RUNNING AT HIGH SPEED.

The cost of running a railroad, or what is now more commonly called "the working expenses" of a line, varies upon different roads, according to the characteristics of the line to be run, the uniformity of the weight of load carried, and the comparative speed maintained in the running of trains. If a line of railway could be constructed with a straight and level track, of sufficient length to give full play to the practical working capacity of an engine, and the road could command a business equal to its working power, something like an absolute rule could be determined as to the capacity of the railway and its working economy. Any rule attempted to be deduced from any other given state of facts, must fall short of absolute precision.

All practical rules, therefore, touching the management of railways, are only approximate and hypothetical. Still these estimates are so far correct, as to give certain general rules for calculating the cost of carrying a given weight per mile—allowing that locomotive engines will practically accomplish all the results, which their assumed capacity supposes.

It was shown by the returns of the Liverpool and Manchester railway, that the average cost per mile run, for locomotive expenses, including passenger and freight trains, for the six months ending June 20th, 1845, was as follows, viz:

Average Cost per Mile Run.

	Decimal in pence.
Coke	2.054
Oil	0.107
Tallow	0.053
Waste	0.010
Enginemen and firemen's wages.....	1.335
Material for repairs	0.401
Wages for repairs	0.431
Proportion of general charges.....	1.733
	6.124

This did not include any charge for renewing engines when worn out; but all economically managed roads should charge off something for this contingency, in the nature of a sinking fund for repairs. This item will be exceedingly small, because engines properly built have not been long enough in use on any railway in the world, to enable us to say how long an engine will continue to do good service before being worn out. If kept in suitable repair, they may continue to work for unknown years to come. It may therefore be assumed that 6d. or 12d cents per mile was the average cost in 1845 of running a locomotive on the Liverpool and Manchester railway. The average speed adopted was: for 1st class trains, 30 miles an hour; 2d class, 18 miles an hour; goods trains, 16 miles an hour. The general expenses of running are not stated.

The returns of the Great Western railway for six months ending June 30th, 1845, showed that 807,989 miles had been run by their engines on passenger trains at an average cost for locomotive power of 10d. per mile.

Those of the London and Birmingham railway (now the London and Northwestern) ran 609,663 miles in the same time, at a cost of 10d. per mile.

It is assumed by Bourne in his Catechism of the

Steam Engine, that the average cost of locomotive expenses in running on the English roads, when economically managed need not exceed 6d. per mile run. The two roads referred to above, are the great roads of England; representing the rival interests of the broad and narrow gauge parties.—The trains on these roads are run with greater speed than is allowed on any other roads.

The express trains of the Great Western are run at a speed of from 45 to 50 miles an hour; and those of the London and Northwestern have now attained a speed of from 40 to 45 miles per hour.—Trial trips on each road have been run at greater speed, reaching 72, 80 and even at the rate of 84 miles to the hour for short distances on the Southwestern. With the exception of the express trains, on a few of the leading roads in England, the average speed of their trains is scarcely above that now adopted on the roads of this country.

The following statement shows the comparative working expenses per mile run on the Great Western, and London and Birmingham roads in 1844:

	Great Western.	London and Birmingham.
	s. d.	s. d.
Locomotive.....	0 11-927	0 12-728
Repairs of carriages.....	—	0 1-883
" " wagons.....	0 1-476	0 0-598
Guard and porters.....	0 6-514	0 3-075
Police.....	—	0 2-163
Direction and management.....	0 4-441	0 2-827
General charges.....	0 3-191	0 3-372
Depreciation.....	0 3-201	0 5-588
Rates and taxes.....	0 3-790	0 3-346
Maintenance.....	0 7-332	0 8-388
	3 5-872	3 7-968
	83 cents.	85 cents.

The annual returns of the New York railroad companies for 1849, an abstract of which was published in this paper under date of March 30th last, show the following as the average speed of passenger trains on the leading railroads of New York,

	Miles per hour.
Hudson River	30
Attica and Buffalo.....	26
Utica and Schenectady.....	28
Auburn and Syracuse.....	26
Syracuse and Utica.....	25
New York and Erie.....	22

The annual returns of the Massachusetts railroads for 1848 and 1849, give the following statements as to the speed of passenger trains during the last two years as follows, viz:

	1848.	1849.
	Miles per hour.	Miles per hour.
	Ex-press trains.	Ex-press trains.
Hart. & N. H.....	25	23
Western.....	28	22
Bost. & Maine.....	22	25
Bost. & Prov.....	30	25
Bost. & Lowell.....	24	25
Bost. & Worcester.....	22	24
Fitchburg.....	20	22
Eastern.....	21	22

The foregoing comparative statement shows a most extraordinary increase of speed: the same comparative increase substantially appears upon many, if not all the Massachusetts roads.

Here is one prominent cause of the increase of expenses on the Massachusetts roads, and furnishes aid in reaching a solution of the real cause of the present depressed condition of the stock in most of the Massachusetts railroad companies.

The increase of business has not been equal to the actual increase in the working expense of the lines.

The average number of passengers in the express trains of Massachusetts will not probably exceed 120 per trip. To carry this number of passengers, requires the carrying of the following dead weight over the road:

Engine, average weight.....	20 tons.
Tender.....	8 "
Wood.....	1 "
Water, 1,500 galls., 8 lbs. per gall., 6 tons, average two-thirds.....	4 "
Baggage car.....	8 "
Two passenger cars, weight 10 tons each.....	20 "
Passengers.....	10 "

71 tons.

The average usually allowed on all railways is 12 persons to a ton, without baggage, and 10 persons to a ton including baggage.

To carry 10 tons of persons, equivalent to 120 passengers, with their baggage, requires the carrying of a gross load of 71 tons, or 1180 lbs. weight to each passenger carried; or equal to 1000 lbs. dead weight to each person.

The atmospheric resistance to a train increases as the square of the velocity, or in other words, the atmospheric resistance to be overcome, is four times as great when running at the rate of 40 miles to the hour, as it is when running at the rate of 20 miles to the hour.

Edward Bury, Esq., the distinguished locomotive builder of England, stated in his testimony before the gauge commissioners, in 1845, that the injury to the permanent way was in proportion to the speed run. The same principle applies to all the working expenses of a road, including the wear and tear of engines and track. It was recently stated in the *North British Review* that the increased expense to the London and Northwestern railroad company of the Express trains between London and Liverpool, over the charge of running them at the ordinary speed of 30 miles an hour, is over \$100,000 per annum.

To draw a train of 110 tons upon a railroad at a speed of 30 miles to the hour, if there was no atmospheric resistance, would require equal to 97.3 horse power. The atmospheric resistance with a load of 110 tons is at the rate of 12 lbs. a ton, equal to 1320 lbs. running at the rate of 30 miles to the hour. This is equal to 105.8 horse power, which added to 97.3 makes 203.1 horse power required to carry 110 tons at the rate of 30 miles to the hour in a calm atmosphere, or allowing there is no resistance from side or head winds.

Increase this speed to 60 miles to the hour, and you require double the power of propulsion, and increase in a four fold degree the atmospheric resistance. The power required may be stated as follows, viz:

Double the friction of the train	
97.3x2 is.....	194.6 horse power.
Take the square of the atmospheric resistance 105.8x4 is.....	423.2 "
As twice the distance is passed over in the same time, you double this resistance.....	423.2 "

And you have a total of.....1,041 horse power, required to carry 110 tons at a speed of 60 miles to the hour.

To run therefore at high speed on railroads, requiring an increased expenditure far beyond what is the limit of economical working, and generally far beyond what any road can sustain.

The public are not willing, at the present time, to pay the needful equivalent for being carried at high velocity.

There must be a radical change in the manage-

ment of railways in this respect, or the most disastrous consequences are sure to follow. Already the public are reminded of the fact that the older roads in the country are rapidly going to decay. The fearful accident recently on the Norwich and Worcester railway, is an admonition that should not be lost. The frequent recurrence of explosions of locomotive engines, points out the necessity of more careful attention to the condition of engines and the character of those who have them in charge.

It was stated by several of the most distinguished engine builders and engineers of Great Britain, before the gauge commissioners in 1845, that the speed then attained on both the broad and narrow gauge roads, was dangerous and absurd, and that a check should be placed upon the speed of trains. With the facilities now enjoyed by means of the telegraph, the commercial world can dispense with the present dangerous and expensive system of running at such fearful velocities.

It is true, there are no mechanical difficulties in running at a speed of 100 miles to the hour upon a straight and level track. The only limit to the speed of the locomotive, is the limit of the strength of iron. If greater speed is required, wrought iron must in all cases take the place of cast iron wheels.

The centrifugal force upon a wheel driven at the rate of 60 feet per second, is equal to a pressure of 1100 lbs. to the square inch. This has been the maximum speed regarded as safe in fly wheels of cast iron. Fly wheels have been known to burst under a less speed even than that.

The speed of 60 miles to the hour is at the rate of 88 feet per second. The danger of using cast iron wheels in running at extraordinary velocities, is apparent to the most ordinary mind.

The mechanical principles applicable to railway running are far from being understood by a majority of men employed in conducting railroads, and many of the most important of these principles are daily violated upon very many of the railroads of the country.

The science of railway construction has probably reached very nearly a practical limit. The mere cost of construction cannot now be much reduced, except through the introduction of cheaper labor. But in the management of railways, the public mind has hardly begun to embrace the idea in any adequate measure.

This question is now forced upon many railroad companies by the depressed condition of their stock. The idea is gradually gaining ground, that railroads should be built and managed by men of skill and experience in the departments of practical science. Who would think of sending to sea a most valuable ship and cargo under charge of a man who knew nothing of nautical science, or the commonest principles of navigation? Still we see men placed in charge of railways who are as ignorant of all mechanical principles—of the nature of steam—or of the capacity of the locomotive engine, as they are of an unknown language.

This state of things can only be corrected by applying individual sagacity to railroad management. Every day brings into use some valuable discovery—some decided improvement upon past experience. Railroad directors should be men of practical sagacity united to comprehensive attainments, and enlarged purposes. The person at the head of the company, should be the best informed man in all the practical details of railway science. Without the possession of these qualities, there will soon be apparent a laxity of discipline and a neglect of duty in all the departments of railway management.

Military discipline is no more essential to the efficiency of an army, than it is in the management of a railway. The man who supposes that situations upon a railway can be parcelled out as sinecures to his friends, may rely that it can only be done at an infinite cost to the road. No department of duty or discipline can compare with that required in the railway service. The best skill can alone ensure proper success.

A board of directors have haggled about the salary of an engine driver, for the purpose of saving a few dollars a month in his pay, and have then put an unsuitable man in his place, who in one trip of his engine has cost the company, by his want of knowledge, twice the amount of his yearly salary.

This topic is full of interest and instruction. It has reference to the most important functions in the railway service.

The public is impatient of delay, and demand speed in travelling without paying the equivalent price. Persons can be carried by railway as cheaply as merchandise. Why not graduate the price of tickets by the speed required, and let those who must go fast pay in proportion to the increased expense of carrying them at high speed? and those who are willing to go at reasonable rates, pay for them accordingly.

Gold Mining.

Sir Roderick Murchison, the celebrated mineralogist, recently delivered at the Royal Institution of Great Britain, a most interesting lecture on "The distribution of gold ore in the crust and upon the surface of the globe."

He stated it to be an axiom that gold ore never occurs in any great quantity except under certain conditions or "constants," which may be thus briefly explained to be where the ancient stratified rocks which constitute the backbones of continents or great islands, have been penetrated and altered and crystallized by the intrusion of igneous or eruptive matter. The golden vein-stones which rise up from beneath have been carefully examined to a very considerable distance below the surface, and it has been ascertained that they invariably deteriorate in value, i. e., in the per centage of pure gold on the weight of the deeper the search is made. All the rich portions are found near the surface; hence the powerful rubbing or attrition which that surface has undergone in ancient times, has, by grinding down the tops of mountains, carried away by far the greatest quantity of valuable ore, and distributed it in heaps of gravel and sand, in plateaux or in valleys.

The learned lecturer inferred that gold was of a very recent date as respects geological history, though of great antiquity as respects the human race. Indeed, the accumulations on the flanks of the Ural mountains clearly proved that iron and copper were formed before gold. These Ural mountains and Siberia furnish more than half of all the gold produced throughout the world. From the Ural mountains and the twenty-five districts of Siberia, in the region around the flourishing city of Krasnojarsk, of which one is 200 miles in length and 100 in breadth, where the metal is invariably found in the broken materials and debris above mentioned, nearly the value of £3,800,000 in gold is annually derived. Precisely similar geologically, are the chief backbones of the American continent, which also afford at intervals clustered collections of gold ore. As a proof that gold in a mine diminishes as the solid rock is perforated downwards, the authority of Colonel Colquhoun, R.A., long resident in Mexico, was cited to show that in Guadalupe y Calvo, vein-stones opened out by British enterprise, though at first productive, gradually declined in value, and became poor as the ore was sought for deeper, and finally became purely argentiferous. The same was shown by Mr. Warrington Smyth to be the case in the gold mines of Hungary.

A brief historical sketch of the subject was given, in which it was stated that Job was a true and

good geologist, when he said "There is a vein for the silver," and "the earth hath dust of gold." "If, however," said Sir Roderick, in conclusion, "we allow ourselves to speculate on the moral effects of this golden shower, we must, I apprehend, admit with the ancient historian (but no geologist) Diogenes Siculus, that gold is obtained with toil, is retained with difficulty, creates everywhere anxiety, and in its use produces both pleasure and pain."

Ohio.

Cleveland, Painesville and Ashtabula Railroad.—

We find in the True Democrat an abstract of a report of F. Harbach, Esq., of his survey of this road, of which we give the following particulars:

Two lines have been surveyed and estimated on this route.

First, the south route, beginning at the city station, following the hill side along the Ohio canal to Kingsbury's run—thence to the level of the plain—and thence straight to Euclid creek; Chagrin river, crossing at Willoughby; Grand river, crossing at the "Furnace," near Painesville; Ashtabula river, crossing at Ashtabula; Kingsville; Conneaut creek, near Conneaut; and last, to the intersection of the route surveyed and located at Erie, at the Pennsylvania State line.

This line follows the "South Ridge," mainly.—With the exception of getting up Kingsbury's run, and curvings to obtain good crossings at rivers, only three curves occur in the whole distance—over seventy-one miles.

Second, the north route, begins at the outer station of the Cleveland and Pittsburgh railroad, two miles from the lake station of C., C. C. railroad—thence straight to Euclid creek and Willoughby over the south line; thence to Grand river, two-thirds of a mile north of Painesville—thence on a line parallel, nearly, to south line, and from half to one and a half miles distant from it, to the Pennsylvania line.

Differences in the two lines trifling. Characteristics similar. This is the result:

	South route.	North route.
Total rise.....	338 feet.	312 feet.
fall.....	291 "	246 "
Highest ground passed over by south route 150 ft.		
" " " north " 125 ft.		

Difference in favor of north route..... 25 ft.

The table of curvatures and of curves shows the same result. In the latter, the difference in favor of the North route, is 3.39 miles.

So as to distance. The length in straight line is:—

South route.....	60.69
North route.....	64.08
Equated length of line.	South line North do.
For curvature.....	0.58 0.37
For grades.....	35.13 27.90
Add actual length.....	71.46 71.46
	107.17 99.73

Difference in favor of north route, 7.41.

Mr. Harbach estimates the cost as follows:—

South route.....	\$1,351,913 95
North route.....	1,308,506 79

The difference, then, in the cost of the two lines stands thus:—

Difference in favor of northern route..	\$43,407 16
South route per mile.....	18,907 88
North route ".....	18,307 79
Difference in favor of north route per mile.....	607 09

Mr. Harbach says:

I have estimated the excavations twenty feet, and the embankments sixteen feet wide at the grand line. Culverts of stone or brick, and bridges of a most substantial character, of timber trusses, rails of the T pattern, weighing sixty-five pounds per yard, laid

upon cross-ties two and a half feet apart, with the usual fastenings; ballasting of sand or gravel, wherever improper material is found; and with ample equipments, buildings, shops and fixtures to do the work in the most economical manner. Thus you will have a road for about \$19,000 per mile, of the very highest order, essentially straight and level, which peculiarly adapts it for successful competition with steamers on the lake; the average cost of which per mile is far below that of the eastern roads, and will compare favorably with any of the western lines in progress of construction.

The lines surveyed present very remarkable facilities for the construction of a railroad at cheap cost, and calculated for the highest speeds. The construction of a railroad from Buffalo to the west by the lake shore, and the early completion of the New York and Erie railroad, gives to the above line a great importance, as it will open a communication between the roads at the east and the net works of railways, which is so rapidly covering the whole west. We have no road in our minds that offers superior inducements to the capitalist to invest in it. In addition to this, it is a work absolutely necessary to the full development of the capacity for business of the great lines on either side. With so many inducements to its construction, and such an interest in its favor, we count upon its completion at an early date.

The following is a list of the directors of the company:

Alfred Kelley, Columbus, Ohio.
Heman B. Ely, Cleveland, "
Peleg P. Sandford, Painesville, Ohio.
David R. Paige, Centerville, Lake co., O.
George G. Gillett, Kingsville, Ashta. co., O.
Ebenezer B. Woodbury, Kelloggsville, Ashtabula co., O.
Samuel L. Selden, Rochester, N.Y.

Acting President,
HEMAN B. ELY,
Treasurer,
ABEL KIMBALL,
Madison, Lake Co., O.
Chief Engineer,
FREDERICK HARBACH,
Cleveland, Ohio.

New Hampshire.

New projects of railroads continue to be started in New England in spite of the depressed condition of railroad property in that quarter. We learn that a thorough survey for a railroad, to connect the Contoocook Valley road with the Ashuelot is about to be made, and the able engineer, Jonathan Adams, has been engaged to make the survey. The enterprise is urged forward by the Concord people and others. There is a prospect that something effective will be done.

OHIO AND PENNSYLVANIA RAILROAD.

We learn that the bond of the cities of Pittsburg and Allegheny, which were issued to this company, to the amount of \$400,000, have been negotiated in this market. This sum places the company in a position to push forward the work with vigor.

We find in the Pittsburg Gazette the following statement of the present condition of the work:

"The division between Pittsburg and Beaver will be let on the 24th of this month, and there is money enough provided to finish, and probably to stock it. The division between Beaver and the Ohio State line is all under contract, and will be finished in good time. The individual subscriptions of Pittsburg and Allegheny are appropriated to this division, and will be sufficient to prepare it for the rails. The Columbiana county division, between the State line, and the line of the Wells-ville and Cleveland road, is nearly ready for let-

ting—the locating party being expected to finish their work in a few days. This division will be let to contractors on the 8th of May. Sufficient stock has been subscribed in Columbiana county, mostly in Salem, to grade and bridge the road thro' that county. There is a small section of this division, which passes through a corner of Mahoning county, for which no provision has been made, and the directors look to Pittsburg to supply the necessary means.

The division extending from the line of the Wells-ville and Cleveland road to the Ohio canal, at Massillon, has been under contract for some months, and will be finished quite early. The people of Stark county provide the money for grading and bridging this division.

Under these favorable circumstances of the enterprise, there is nothing extravagant in anticipating that, by the 1st of July, 1851, the cars will be running from Pittsburg to Cleveland, and to Massillon, on the Ohio canal; and, by the ensuing fall—if the citizens of Wayne and Richland counties come up to the work with proper spirit—the road may be finished."

Morris Canal.

We copy the following table prepared by Mr. Talcott, of the Morris canal, of tonnage transported on the canal for the past 3 years:

	1847.	1848.	1849.
Bar and pig iron.....	16,940	16,556	25,918
Blooms and billets.....	1,720	1,697	1,638
Brick.....	2,122	3,757	1,807
Castings & machin'y.....	230	195	107
Clay, earth, sand etc.....	6,621	4,825	2,320
Dry goods & groceries.....	2,585	2,314	3,813
Flour, feed, etc.....	2,410	4,319	5,189
Iron rails.....	5,020	7,377	47
Hoop poles, rails, etc.....			957
Lime.....	1,764	2,528	2,163
Limestone.....	1,810	5,480	3,397
Lumber.....	3,364	5,450	5,838
Mineral coal.....	67,068	89,879	114,017
Nails, spikes, etc.....	807	401	305
Ore and forge cinders.....	28,314	46,922	53,772
Plaster.....	738	2,102	1,823
Timber and logs.....	3,324	1,913	2,406
Wood, bark, etc.....	6,010	6,605	5,325
Sundries.....	4,130	1,167	1,997
Total.....	154,559	204,682	234,305

The business in 1845 amounted to only 58,249 tons, and in 1846 to 109,505. Thus it will be seen that the business has steadily increased since the year 1845, and that it was more than doubled in 4 years ending in December last.

Alabama:

West Point Railroad.—We learn from the Montgomery Journal that the stockholders of the Montgomery and West Point railroad held their third annual meeting on Monday, the 8th inst. Charles T. Pollard was re-elected president, and Thomas M. Cowles, Wm. Taylor and Abner McGehee, of Ala., and Hon. John P. King, of Ga., directors.

The following extract from the report of the president, shows the operations of the company for the year ending the 1st March, 1850.

Gross receipts of the road.....	\$120,781 61
Receipts from other sources.....	4,656 16
Making a total income of.....	\$125,437 77
The expenses of the road have been.....	\$55,213 64
Interest paid on loans.....	18,017 93
	73,231 57

Showing a net income of.....\$52,206 24 or within a fraction of 8½ per cent. on the capital stock of the company.

Lead.

The following table is taken from the report of Capt. Wm. H. Bell, U. S. inspectors of the mines, dated at St. Louis, Sep. 30, 1842:—

Production of the lead mines in the valley of the Mississippi for twenty years, each year ending Aug. 31.

Yrs.	Upper Mississippi mines. Lbs.	Lower Missouri mines. Lbs.	Total production. Lbs.	Price of lead at St. Louis, Mo., p. lb. Cents.
1823..	335,130		335,130	
1824..	175,220		175,220	
1825..	664,530	2,203,850	2,868,380	
1826..	958,842	3,208,374	3,967,216	
1827..	5,182,180	3,616,204	8,798,384	4½ to 5
1828..	11,105,810	6,399,714	17,505,524	3½ to 3½
1829..	13,343,950	4,183,124	17,527,074	2 to 1½
1830..	11,942,000	4,103,894	16,045,894	2 to 2½
1831..	12,026,000	2,859,628	14,885,628	2 to 3½
1832..	12,099,360	7,810,456	19,909,816	4 to 4½
1833..	13,593,330	8,285,496	21,878,826	4 to 4½
1834..	17,245,620	6,391,216	23,636,836	4 to 4½
1835..	18,970,910	7,228,108	26,199,018	4½ to 5½
1836..	25,512,550	6,329,914	31,842,464	5 to 5½
1837..	21,745,780	5,121,624	26,867,404	
1838..	24,217,760	6,050,170	30,267,930	
1839..	26,826,450	7,981,628	34,808,078	4½ to 4½
1840..	26,849,900	6,255,754	33,105,654	4½ to 4½
1841..	33,274,155	7,430,896	40,705,051	3½ to 3½
1842..	40,854,100	*7,500,000	48,354,100	
Total 316,923,577	102,760,050	419,683,627		

Pounds.

NOTE.—During the years 1841 and 1842, it is stated that there were exported of lead, from the mines by Lake Michigan..... 2,000,000

Also, the annual produce of the following mines is

For those of New Hampshire.....	1,000
For those of New York.....	670,000
For those of Virginia.....	878,648
For those of North Carolina.....	10,000

Add to this the product of the valley mines for 1842, as above..... 48,354,100

Making a total annual production of lead from all the mines of the United States..... 51,913,748

* Supposed number of pounds.

Georgia.

Georgia Railroad.—Comparative statement of the Georgia railroad for the two years ending 31st March, 1849 and 1850, respectively:

	Passengers.	Freights, Mails, etc.	Total.
1849-50..	189,650 45	437,162 86	626,813 31
1848-49..	166,484 04	415,530 55	582,014 59
Increase..	23,166 41	21,632 31	44,798 72

The company have declared a dividend of 3½ per cent for the past six months.

LEWISTON AND QUEENSTON SUSPENSION BRIDGE.

This bridge, which, when completed, will be by many feet the longest in the world, in one clear span, has recently been put under contract by the joint companies holding the charters from New York and the British governments. Capt. Edwd. W. Serrell has been appointed the engineer to carry the project out to completion. The bridge will connect the shores of the Niagara river at Lewiston, N. Y., and Queenston, Canada West, and will be 1,042 feet between the points of support, the roadway will be 75 feet above the water, 19 feet wide, and will be capable of sustaining a load of 800 tons. The towers of support are to be built of hydraulic masonry, surmounted with cast iron caps, which are 76 feet above the roadway. The natur-

all advantages of the locality are so great that it is estimated to cost much less than so large a work would in almost any other locality. It is proposed to have it so far completed by September that it may be opened for travel going to the Provincial Fair.

AMERICAN RAILROAD JOURNAL.

Saturday, April 20, 1850.

Doremus & Nixon,
IMPORTERS AND FURNISHERS

RAILROAD CAR AND COACH TRIMMINGS.

Plain Garnet Plush. Fig. Garnet Plush (Butterfly pat.
"Crimson" "Crimson" "Elegant."
"Scarlet" " " (Gen. Taylor.

BROCATELLES.

Crimson Silk Brocatelles. Gold and Maroon do.
Gold and Blue " " Brown "
Silk and Wool " " of every color.

MOQUETTS,

Of elegant designs and colors.

GERMAN CLOTH FOR CAR LININGS.

The most beautiful goods ever shown in this country, and the subscribers are the sole agents for the sale of them.

Oil cloths Enamelled with Gold. } These goods can be
" " Silver. } furnished in any
Do. Silver ground velvet printed. } dimensions req'd.

CURLED HAIR

Of every description and quality.

JNO. W. A. STRICKLAND, Agent.
New York, 1850. 1yl6

Machinery Oil.

WE the undersigned are now manufacturing an oil intended for the use of Railroads, Steamers and Manufacturing establishments. It has been in use several months and has given very general satisfaction. Our price is uniformly 70 cts. per gallon. Enquiries or orders addressed to promptly. Address

ROBBINS, LANGDON & CO.,
133 Water street, corner Pine, New York.

CERTIFICATES.

Bridgeport, Nov. 7th, 1849.

Messrs. Robbins, Langdon & Co.,

Gentlemen: After about three months' trial of your oil, I have come to the conclusion to use it entirely on the engines on the New York and New Haven and the New Haven and Northampton Railroads for the following reasons:

1. It wears quite as long as sperm oil.
2. So far as I have tried it, it keeps the Journals equally cool as sperm oil.
3. I have no complaint from our men about cleaning the engines, and presume it is equally as easy to clean an engine by using your oil as it is in using sperm oil.
4. I can see no reason why it is not equal to the best of sperm oil for lubricating machinery.
5. There is in my opinion a very great saving to all parties in using your oil for lubricating machinery.
6. I believe it will stand cold weather better than any sperm oil. Very respectfully yours,

R. B. MASON, Supt. N.Y. & N.H. Railway.

Steamboat C. Vanderbilt, N. York, Oct. 11, 1849.

Messrs. Robbins, Langdon & Co.,

Gentlemen: In reply to your inquiries respecting the qualities of your machinery oil, I am happy to inform you that I have been using the article sent me for some time past, not only on the engine but on all other machinery connected with it: and from a careful and close examination, I am well satisfied that your oil is as good as the best of sperm oil for lubricating machinery. I have recommended Mr. Lockwood the agent of the company, to give you their orders.

Yours respectfully, **JAMES BAKER,**
Engineer Steamboat C. Vanderbilt, Pier 3, N.R.

Brooklyn, August 29, 1849.

Messrs. Robbins, Langdon & Co.,

Gentlemen: Your letter of the 29th was received, and I am happy to inform you that I have used your machinery oil throughout my establishment, and I am still of the opinion that it is as good as the best of sperm oil for lubricating machinery. I should be pleased at any time to have your friends witness the working, and I am sure, after once doing so, will give you their orders. Please send me another cask by the evening of the 3d, and by so doing you will much oblige,

W. M. BURDON, Manufacturer of
Steam Engines and other Machinery, 102 Front st.

Steamer Bay State, Oct. 22d, 1849.

Messrs. Robbins, Langdon & Co.,

Gentlemen: In answer to your request for my testimony as to the machinery oil manufactured by you, I will say that I have used it for some time past on the Bay State, and am perfectly satisfied that your statement to me of its good qualities, is correct. As far as its lasting properties go, it wears equally long as sperm oil, runs perfectly free, and has no appearance of thickening. As seeing is better than hearing, I would recommend you to send your friends on board our boat, and they can then, by ocular demonstration, judge for themselves. Yours respectfully, **JOHN GRAY,**
Engineer of Steamer Bay State, Pier 3, N.R.

Steamboat Knickerbocker, Sept. 22, 1849.

Gentlemen: Mr. Hall, Agent of the Norwich and New London Steamboat Co., placed in my hands some of your machinery oil, which he desired me to use on the engine and other machinery, which I have done, and was so much pleased with the working, that I recommended the owners to give you their orders.

I have been using the article since August 19, and with perfect satisfaction, and I am well satisfied that your oil is as good as the best of sperm for lubricating machinery. I am yours very respectfully,

SAMUEL CARTER,

Engineer of Steamboat Knickerbocker, Pier 18, N.R.
To Messrs. Robbins, Langdon & Co.,
Oil Merchants, 133 Water street, New York.

Steamboat Worcester, N. York, Oct. 15, 1849.

Messrs. Robbins, Langdon & Co.,

Gentlemen: I beg to acknowledge the receipt of your letter requesting my opinion as to your oil for machinery, which I had not time to reply to previous to my return to Norwich. I have been using your oil on the engine and machinery of the Worcester with perfect success, and have much pleasure in testifying as to its good qualities. In my opinion, the journals keep cooler with your oil than with sperm, and it wears equally well. Should you at any time wish to refer to me as to your oil, I beg you will do so without hesitation. Yours respectfully, **JAS. CROOKER,**
Engineer Steamboat Worcester, Pier 18, N. R.

New York, August 3d, 1849.

Messrs. Robbins, Langdon & Co.,

Gentlemen: I received your letter in regard to your oil for machinery, which I handed to our engineer, and have much pleasure in sending you an extract from his letter to me on the subject: "I have applied the oil sent me upon our hot journals and cylinders, and find that they keep cooler with it than with sperm oil. I cannot find any fault with the oil, although I have watched it carefully. I have also tried it against an equal quantity of sperm oil, and find it wears quite as well." You are quite at liberty to show this extract to your friends, and shall be happy to give any further certificate you may require. **WM. RIDER,**
Treasurer Union India-rubber Co., 19 Nassau st. N.Y.

New York, March 22d, 1850.

Messrs. Robbins, Langdon & Co.,

Gentlemen: I have been using your machinery oil on the engine and other machinery of the Steamer Southerner running from this to Charleston, and find it equal to sperm oil. I shall continue the use of the same, and you are at liberty to refer to me at any time.

Yours respectfully, **DAVID N. MAXON,**
Chief Engineer Steamer Southerner.

Providence, March 22d, 1850.

Messrs. Robbins, Langdon & Co.,

Gentlemen: We have given your machine oil a thorough trial, and find that it possesses all the qualities that we could wish, as it works better than any sperm oil we have ever used. Our shafts that required oiling four times a day with the best sperm oil that we could get, work equally as well by the application of your oil twice a day, and your oil stands cold weather much better than any oil we have ever used. Our engineer having had years' experience in running and making engines, we put great confidence in his judgment, and he gives it as his opinion that your oil is fully equal to if not better than any he ever used; and we shall soon give you an order for more, as we do not want any other kind of oil as long as we can get yours.

Very respectfully yours,

JACKSON, CLARK & CO.

BALTIMORE AND OHIO RAILROAD.

Contractors will please notice the Advertisement of further lettings upon this road on another page. They embrace a large amount of work, and are well worth the attention of persons engaged upon public works.

Shall we Manufacture or Import Iron for our Railroads?

From the extent to which we are engaged in this country in the construction of railroads, and from the fact that we are now importing all the rails we use, it becomes a matter of great importance to consider the influence which the large drain of money required for their purchase will exert both upon the general business of the country, and upon the ability of our people to continue the construction of these works.

Unless there should be some unforeseen check given to these enterprises, there will be constructed at least 10,000 miles of railroad in the next ten years. This may seem a large estimate to some, but when we consider that, to make up this amount each State would have to build only 33½ miles yearly, and that many will build twice or three times that extent; we think it will be found to be much below, instead of above the mark. A very large amount of iron in addition will be required for relaying of tracks and repairs of roads. This estimate will require over 100,000 tons annually, and will, at present present prices, cost at least \$5,000,000,000. This sum, therefore, must be sent yearly to England for the article of rails alone, unless we engage in their manufacture.

The high price of money which has so long prevailed in face of the great importations of gold, is in part owing to the large sums we send abroad on account of our railroads. The condition of the money market in Massachusetts, affords a good illustration of the influence of railroads in absorbing the capital of a community. That State has built more railroads than any other, but she is vastly richer in proportion. She is the most commercial of any, and commerce is the parent of wealth. Her floating capital has been almost entirely invested in railroads and manufacturing establishments.—She has not enough left to carry on with ease her ordinary business. She is compelled to borrow from others, till she can, by industry, create sufficient to supply the place of that which she has, for all present practicable purposes, lost. This great scarcity of money has depressed the price of her railroad and manufacturing stocks of a ruinous degree, and has placed it out of her power to continue the construction of railroads as formerly, even if she desired to do so. Thus far in New England alone have railroads been prosecuted beyond the ability of those constructing them; so far, we mean, as to influence business in all its ramifications.—There have been numerous instances of failure of railroads in various parts of the country; but these involved the failure of a few individuals, and not the embarrassment of a whole community.

Very many States are now commencing upon projects, which, if carried out, will require as large, and in fact a much larger amount of capital in proportion to their means than Massachusetts has expended. These States after exhausting their domestic resources, will resort to the commercial cities, and New York in particular, for money to complete their works, till a very similar state of things which we now witness in New England, will exist in every part of the country. Boston has been exhausted by New England, and there is danger that New York will be, in the same manner, by the other parts of the country, more immediately connected with her. Our people will continue to build railroads till every farmer in the United States inhabiting a fertile section shall be in convenient distance of one. Men will make any sacrifice, rather than give up this wonderful invention, which gives

him the facility of omnipresence, as far as this is consistent with the conditions of material existence. Who, now on the stage of active life, does not remember that in his boyhood, the most intense desire of his heart was to be able to fly through space, with the ease, freedom, and swiftness of the bird? Yet while we have been coming up to take our place on the theatre of action, this dream and longing of the soul has been realised, and we can now move along, in those most elegant and comfortable saloons, unconscious almost of motion, with a speed exceeding that of the eagle in its flight. Is it to be expected that man will relinquish this new and wonderful faculty? No. They will retain it at the expense of every other. But the enormous cost of these works threatens to make us pay a heavy penalty for their enjoyment; that the simultaneous construction of so many lines will so far exhaust the available means of the country as to seriously affect, not only the value of this kind of property, but injuriously to interfere with all the business transactions of society. As our people, therefore, will continue to push them forward, irrespective of these consequences, it becomes of the highest importance that we should pursue that course which shall avoid these consequences as far as can be done.

In looking at the State of Indiana, for instance, we see that her people find no difficulty in constructing their numerous lines of railroad in progress, until they come to the purchase of the iron—their difficulties then commence. All before that is easy work. What is the reason of this? It is not because her people have not an abundance of property, but they have no money. They have labor, and abundance of food for the support of this labor. A substantial farmer, therefore, can with the aid of the force which he must maintain to carry on his farm, prepare a section of the line for rails, which would cost \$1,000; easier than he can raise \$200 in money. He has a surplus of every thing the country can produce. This surplus can be made available to sustain and pay labor, but from his great distance from market it cannot be converted into money. His hay, oats, wheat, corn, potatoes, beef, pork, his horses and cattle, his implements of husbandry, are just as efficient as money itself, to execute this work; yet these could not be converted into money without an immense sacrifice. An independent farmer, therefore, without any embarrassment, can devote one-fourth of his time and an equal amount of his surplus products, to the work of constructing railroads, and receive in exchange its stock. There are great numbers of people on every line who would be glad to do this, and in the Southern States in particular, large amounts of stock in their railways are subscribed to by planters, with an understanding that they are to work out their assessments. If instead of the road being constructed by those who take stock in it, it is let to contractors, the result is pretty much the same. The proportion of profits to the work performed, bears but a very small per centage.—The money paid for work returns immediately to those who contributed it, for supplies of provisions, lumber, labor, etc. But little goes out of the country. It changes hands, but soon returns to the hands of its original possessor for articles he can very easily produce, but which he could perhaps never sell, except for the opportunity thus afforded.

Suppose that for the grading of her roads the people of Indiana were compelled to send to England for workmen, who brought with them all their tools, provisions, every thing necessary to complete

their work, and returned when it was finished, without leaving one cent behind of what they had received, would not her people find it just as difficult to grade their roads as to furnish the iron? Precisely so. It would be of no consequence whether their money went to England for grading or for iron. Would not such a state of things as we have supposed render it impossible to build at present one road now in progress? We think that every person connected with them would answer "yes."—These men would at once say, "we had better pay twice as much to our own citizens to grade our roads as we must pay to the Englishman. The former will take what we have got, or buy what we have to sell, but the latter we can only pay with money, and this we cannot get; neither can we send to England our products, as nine out of ten would cost more for transportation than they would be worth after they reached a market. We cannot send to England our horses or wagons, hay, oats, potatoes or timber, our beef, pork or wheat, save at an enormous cost, and some of them not at all.—All these our own contractors will purchase at a fair price. We have an abundance of property, and if we can exchange it for railroads we can build them without feeling the burden."

Indiana possesses a plenty of coal and iron ore. If she had furnaces and rolling mills, would she not find herself able to purchase the iron for her roads in the same manner that she is able to procure their grading? We are to presume that the profits of iron making would be no greater than of grading a railroad. All that is paid for iron over and above profits goes in some way or other to the support and maintenance of labor. The labor engaged in iron making must be supported by the various other industrial classes, which make up the community; so rails, after they are made, represent an equal aggregate value of a large amount of the products of the other classes. The process of iron making is simply the conversion of one kind of products into another. The capacity of this State to purchase English iron must depend entirely upon her ability to convert her products into money. She has no market at home for her surplus. All must be exported. Now, her most valuable products will not bear the cost of transportation, consequently they are not available to the purchase of iron. She exports wheat and port; but it costs more to send these articles to England than to produce them; involving a greater loss than their whole home value. The surplus of these articles is limited, and last year the wheat crop of that state was an entire failure. So long therefore as she continues to purchase from abroad, her ability to do this is limited to the extent of her surplus of a few exportable articles, which cost more to send to a market than they are worth when prepared for exportation. But if she manufactured her iron, her surplus would at once be available, and she would save all the expense of forwarding her bulky products to a market, which imposes so heavy a burden upon her industry. A rail, therefore, manufactured at home may be very cheap at \$50 per ton, and very dear at \$40 when imported.

But this is not the only evil of foreign importation. In common parlance, we say that gold and silver is the standard of value of other articles. By conventional agreement, we substitute a paper currency for that of gold and silver, for all the leading transactions of business. This circulating medium is nominally based upon precious metals; but banks issue in bills four or five times the amount of the specie they keep for their redemption. This

is found to be a safe limit. The object of the substitution being to dispense with the use of the precious metals as far as possible from a service where they are not employed in reproduction. The withdrawal of \$5,000,000 from the vaults of banks would have an effect to reduce their loans five times this amount. Money of consequence would become scarce, the value of all kinds of property fall, and embarrassment and distress would ensue. But so long as the specie remains in the country such fluctuations cannot take place. Our paper circulation would never become less from the payment of this sum in gold for rails of a domestic manufacture.—Thus while home manufacture enables us to accomplish works which would be beyond our ability if we imported from abroad the materials of their construction, we avoid those fluctuations in business which must occur when, by importing beyond our means, we place ourselves in the hands of a foreign creditor.

We hope that this subject, which so deeply concerns all the varied interests of the country, will attract the attention it deserves. We are happy to state in this connection that the view of the subject which we have presented, has received the favorable consideration of some of the leading men of Virginia, and they are seriously proposing to manufacture from their own ores the iron for the great Virginia and Tennessee railroad. This course we are satisfied will be found to be for her interest in the end. She is embarking with her State credit largely in public works. If she would escape embarrassment, and preserve her energies unimpaired, she must produce within herself whatever is necessary to their construction. She has every material of the greatest excellence, and in inexhaustible abundance, and it would be a reproach to her to go abroad for iron for her roads instead of making these instrumental in the development of her great resources.

CAR TRIMMINGS FOR RAILROADS.

Railroad Companies and Car Makers are invited to examine the Advertisement of Messrs. Doremus & Nixon, in another part of our paper. The goods offered have been selected for our market by an agent who visited Europe expressly for this purpose, and are of the most elegant description, and of the most approved quality and styles.

OIL FOR MACHINERY.

We would call the attention of all interested in the machinery of any kind to the Advertisement of Messrs. Robbins, Langdon & Co., in another column. The certificates published are from persons whose well known reputation is a sufficient guarantee for their statements, and who have the best opportunity of subjecting it to thorough tests. As oil forms an important item in the cost of working machinery, we think that all engaged in running it should, upon the evidence presented to them, make a trial of this new article.

Massachusetts.

Western Railroad.—The following statement exhibits the earnings of this road for the four months ending the 31st ult., compared with those of the same period last year:

	Passengers.	Freight.	Other sources.
1850...	\$144,410 86	\$213,794 13	\$9,820 32
1849...	137,050 63	199,868 51	9,636 80
Increase..	7,360 23	13,925 59	183 52

The total increase is thus shown to be 21,469 34 dollars, and the expenses will not vary materially from those of last year.

Our Foreign Correspondence.

In this day's paper will be found a very interesting letter from our foreign correspondent in Rome and the Papal States. Though not strictly coming within the range of subjects to which the Journal is devoted, we cannot doubt that it will prove equally acceptable to our readers as the former ones.

These letters from Europe which have appeared in the Journal are from the pen of Joan M. Adams, Esq., of Portland, Maine, a gentleman actively devoted to the legal profession, who is abroad on a tour of observation and pleasure. Mr. Adams has enjoyed unusual facilities for observation, from the fact of possessing a thorough knowledge of the French language, and a sufficient acquaintance with those of Italy and Germany to have all the useful information accessible to a stranger. With a taste for the physical sciences, and a fondness for an examination of public works, we look for some valuable hints upon European railways, both in Great Britain and on the continent.

While in England Mr. Adams proposes to give attention to the doings of Parliament and the law courts, his visit being purely for observation in view of improvement in the legal profession, his letters are not made up for the purpose of ekeing out a page of argued correspondence; but are the voluntary offerings of a personal friend, upon such topics as he may have time to write upon, that may be suited to the purposes of the Journal. They possess, therefore, a value far beyond ordinary newspaper correspondence.

We have been happy to know they have attracted attention in various quarters, from the style of their composition and the valuable information contained in them; and we are happy to say that Mr. Adams has again returned to Paris, from whence our last advices from him are dated, and that we hope hereafter to be favored with a letter by every steamer.

The Railroad Journal.

The American Railroad Journal was the earliest work published in any part of the world devoted to the railway interest. In its pages is to be found the only full and complete history of railway progress, the only authentic record of the discoveries and improvements which the greatest of practical sciences has drawn forth and perfected.

The means of enhancing its value under its present proprietorship are far greater than when we assumed its charge about one year ago. It will continue to furnish the best practical results as to the construction and working of railroads, the details of progress in steam navigation, commerce, mining, manufactures, banking and the mechanic arts.

The best practical talent that can be enlisted in the country is engaged to supply its pages. The mining interest will find evidence of the first systematic attempt to give a full view of the iron, copper and lead ores of the country, with the results of practical working. In all the branches of mechanical industry we seek to discard the crude conceits of unskilled pretension, the thousand useless novelties issuing from the Patent Office, and to give encouragement to whatever can be made useful in relieving the wants, in ministering to the pleasures, or contributing to the advancement of the race.

We invite contributions to its pages from all who sympathize in our labors, information in any form from those most interested in the progress of mechanical invention, and substantial support from all who are willing to aid us in the arduous duties of our position.

NOTICE TO SUBSCRIBERS.

Such of our Subscribers as wish for back numbers of our paper to complete their sets, or who may not have received the index of the past year, are requested to send for them without delay.

Back Volumes of the RAILROAD JOURNAL

From its commencement can be had on application to this office.

Spikes, Spikes, Spikes.

ANY person wishing a simple and effective Spike Machine, or a number of them, may be supplied by addressing J. W. FLACK, Troy, N. Y. March 6, 1850.

TO CONTRACTORS.

PROPOSALS will be received at the offices of the Baltimore and Ohio Railroad Company, at Baltimore, Cumberland and Wheeling, up to Wednesday, the 22d day of May next inclusive, for the graduation and masonry of the portion of that road, extending from the bridge on the northwestern turnpike, over the Tygart's valley river, to a point on the south fork of Fish creek, near the mouth of Long Drain, embracing some 56 sections. Also the 8 sections between the mouth of Grave creek and the city of Wheeling.

A variety of work will be presented by the line to be let, which will include light and moderately heavy grading. Several short tunnels, and a considerable amount of bridge masonry.

Specifications may be had at the above named offices on and after the 1st of May ensuing, and further information obtained from the engineer upon the line.

Unexceptionable testimonials of character must accompany the bids, and the bidders are requested to state what other work, if any, they are engaged in, and when it will be completed.

The work must be energetically prosecuted.

By order of the President and Directors.

BENJ. H. LATROBE, Chief Engineer.
Baltimore, April 10, 1850. 16

Notice to Contractors.

Bellefontaine and Indiana Railroad.

SEALED PROPOSALS will be received at the Company's Office in SIDNEY, Shelby Co., Ohio, on and after Wednesday, May 5th, 1850, for doing the Grubbing, Clearing, Grading and Masonry, of such portions of the BELLEFONTAINE AND INDIANA Railroad, as can be prepared for letting by the 15th.

The line extends from some point on the Cleveland, Columbus and Cincinnati Railroad, through MARION, BELLEFONTAINE and SIDNEY, to the STATE LINE, between Ohio and Indiana, a total distance of about 120 miles.

It is expected that the line from the eastern terminus to Marion, about 22 miles, and from Bellefontaine to Sidney, about 23 miles, will then be ready to let; and the remainder of the route as soon thereafter as it can be located and prepared.

Specifications and plans will be ready for inspection and all necessary information may be obtained on application at the Office of the Chief Engineer, in Marion, or to J. Pemberton, Resident Engineer, in Sidney, after the 5th of May.

By order of the Board of Directors.

W. MILNOR ROBERTS, Chief Eng.
Engineer's Office, Marion, Ohio, }
March 18, 1850. } 15tf

Notice to Contractors.

Ohio and Pennsylvania Railroad.

PROPOSALS will be received at the office of the Ohio and Pennsylvania Railroad Co., in the city of Pittsburgh, until Wednesday, the 24th day of April, 1850, for the Grading and Masonry of the Railroad, from Allegheny city to the mouth of Big Beaver, a distance of twenty-four miles. Drawings and Specifications of the work to be let, may be seen at the office in Pittsburgh, for one week previous to the letting, on application to Solomon W. Roberts, Chief Engineer, and information may be obtained at any time at the office of Edward Warner, Resident Engineer of the Eastern Division, New Brighton, Beaver County, Pa. The work is well worthy of the attention of good contractors.

The Grading and Masonry of the line in Columbiana County, Ohio, will be let at Salem, on Wednesday, the 8th of May.

By order of the Board of Directors.

WM. ROBINSON, Jr. 15tf

Railroad Iron Wanted.

Virginia and Tennessee Railroad Office,

Lynchburg, Va., March 16, 1850. }

PROPOSALS will be received at this Office until the 6th of May next, for the delivery in Lynchburg, of Iron Rails for the Virginia and Tennessee Railroad, to be manufactured in or near this town of Virginia Iron.

The said Iron to be made of the best pig metal, and to be delivered at the following times, and in the following quantities, viz: Six thousand tons in the year 1851, and the remainder (about 15,000 tons) for the whole road, equally, in the years 1852 and 1853.

Separate proposals will also be received for the delivery in Lynchburg, of pig metal, at times and in quantities sufficient for the manufacture of the rails above mentioned, said delivery to commence as early as the first of November, 1850.

The rails and the pig metal will be subjected to strict inspection; the rails are to weigh about 60 lbs. per yard.

At the same time, proposals will be received for the above quantity of Iron, manufactured any where else in America or in England, to be delivered in Lynchburg or Richmond, under the same general conditions as those prescribed for Virginia Iron, manufactured at Lynchburg. Satisfactory security will be required.

Proposals for delivering any portion of the above mentioned quantity, and at periods varying from those specified above, will be considered.

By order of the Board of Directors.

CHAS. F. M. GARNETT,
Chief Engineer. 15tf

To Contractors.

SEALED PROPOSALS will be received at the Office of the Nashville and Chattanooga Railroad Company in Chattanooga until the 20th day of May next, for the graduation and masonry of the Chattanooga Division of said Road—embracing a distance of 27 1/2 miles.

The graduation will be heavy for about 15 miles, (in crossing Raccoon Mountain, and passing around Lookout Mountain bluff), the balance, average work. The masonry will consist chiefly of cut stone Piers for Tennessee River Bridge, (about 4,000 Perches), Piers for running Water Bridge, (about 2,000 Perches), and Pier for Lookout Creek Bridge, about 500 Perches.

Sealed proposals will also be received at the same time and place, for the graduation of 10 miles of the Eastern end of the Winchester Division—embracing some heavy work. Also the masonry of Elk River and Widow's Creek Bridges.

Plans and Profiles of the Work will be exhibited, specifications furnished, and all other desired information given, on application to Mr. James A. Corry, the Engineer in charge of the work, at the Company's Office in Chattanooga, from the 10th of May until the day of letting.

Before making bids the line should be thoroughly examined. The depths of the Cuts and Embankments can be ascertained from the centre stakes. The work to be commenced immediately after the letting. And that portion from Chattanooga to Lookout Bluffs to be completed by the 1st of December next. The other sections to be finished successively on toward the West end of the Division—the last by the 1st of October, 1851.

The most satisfactory testimonials will be required. The payments will be made in cash—reserving the usual 20 per cent. until the completion of the work.

By order of the Board.

JAMES H. GRANT, Chief Eng.
Nashville, Tenn., March 14, 1850.

To Miners and Mining Companies.

THE undersigned would respectfully call the attention of those persons engaged in mineral operations on Lake Superior to the following list of articles which will be sold on accommodating terms, viz:

600 bbls. Corn fed No. 1 Mess Pork.
500 " Stall fed Mess Beef.
25,000 lbs. " Sugar cured canvassed" Hams.
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60,000 " " Kiln dried" Corn Meal,
500 bush. White "Field" Beans.
300 " Canada" Peas.
500 " Dried Apples.
100 bbls. and half bbls. "cucumber" Pickles.
50 " Sour Kroust.
30 bush. Onions.

1,000 Beefs' Tongues Smoked and in Pickle.

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N.B.—This work is published by subscription of the most eminent in the engineering profession of the U. States, and will be completed in 12 parts, at 75 cents each to those who remit their names and subscriptions before the 1st May next, after which the price will be raised to \$1 per part.

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"It is a work that was a great desideratum, and must prove of great benefit to the engineering profession generally, and especially to the tyro in practical engineering and mechanical knowledge; in truth it strikes us, that it would require years of labor and patient toil on the part of a young engineer to prepare the drawings, and collect the information that will be embodied in this work, and can now be secured for the trifling sum of \$9"—[Scientific Amer. March 16, 1850.]

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FOWLER M. RAY'S Patent India-rubber Railroad CAR SPRING.

New York and Erie Railroad Shops,
Piermont, March 26, 1850.

This will certify that from practical experience in the use of Fowler M. Ray's India rubber Car Springs, I believe them to be far superior to any others now in use.

I have never known them to be affected by any change of temperature, as other Rubber Springs have been affected on this road.

I am at the present time repairing a Passenger Car that Mr. Ray and myself mounted with his springs about two years and eight months since.

The springs are at the present time as perfect, to all appearances, as when first applied to the car.

Respectfully yours,

HORACE B. GARDNER,
Foreman of the Car Shops.

Fall River, February 2, 1850.

In answer to yours of the 20th ult. I would say that this company has for some 10 or 12 months past been using "Ray's India-rubber Springs." We have applied them to both passenger and freight cars with uniform success. They have invariably preserved their elasticity and consistency through all the extremes of weather; and we are now applying them whenever the steel spring fails. I am well satisfied that they are particularly adapted for railroad purposes.

Very respectfully yours,

GEO. HAVEN,
Supt. Fall River Railroad.

Supt. Office N.Y. & H. R.R.,
New York, March 8, 1850.

This is to certify that we have used the Rubber Springs manufactured by Mr. F. M. Ray for the past twenty months, "both for Passenger and Freight Car Springs and Bumpers, and of different sizes," and have in every case given entire satisfaction, and I consider them the best spring now in use.

M. SLOAT, Supt.

Jersey City, March 9, 1850.

This is to certify that the present form of Mr. F. M. Ray's India-rubber Car Spring I consider far superior to the form of Disk, having used both forms. I take pleasure in recommending these springs to all railroad companies.

DAVID H. BAKER,
Foreman of Car Shop of N.J. R.R. & Trans. Co.

Harlem R.R. Depot,
New York, March 7, 1850.

This is to certify that we have used Mr. F. M. Ray's India-rubber Springs for over eighteen months, and find them to be easy and durable, and recommend them to railroad companies as being superior to anything we have tried.

J. M. SMART,
Foreman at 42d St. Depot.

Office of the New Jersey Railroad Co.,
Jersey City, March 7, 1850.

This is to certify that we have had Mr. F. M. Ray's India-rubber Springs in constant use under our cars, and as Bumper Springs for upwards of two years, and they have in every way given perfect satisfaction.

The present form of spring we deem far superior to the form of Disk, having used both forms, although we have none of those made in Disks at present in use.

We take pleasure in recommending these springs to all railroad companies.

J. P. JACKSON, Vice Pres.
New Jersey Railroad and Trans. Co.

Roxbury, February 28, 1850.

In compliance with your request, I take great pleasure in stating the result of my experience in the use of "Ray's Patented Vulcanised India-rubber Car and Engine Springs." We have used them nearly two years, and never had one fail in any way. The cold weather does not affect them, as it has other rubber springs we have used.

With sixteen years' experience as superintendent of machinery on the Boston and Providence railroad, I take pleasure in saying that your springs are the best we ever used, or I ever saw used elsewhere. We have 20 cars rigged with them, of which I can say that the springs are as good now as when first applied. I put 24 lbs. of the rubber under the forward end of one of our heaviest engines, taking off 250 lbs. of steel springs—it has been in use 18 months, and is in as good condition now as when first put under the engine.

Very respectfully yours,

GEO. S. GRIGGS,
Supt. of Machinery, Boston and Prov. R.R.

Boston, March 5, 1850.

In answer to your enquiry about India-rubber Springs, I have to say that we have used them to a considerable extent on both freight and passenger cars, and also on several of our tenders; and I am very well satisfied that they answer all the purposes for which they are intended. I believe the India-rubber will soon supersede all other springs for cars and tenders.

Yours truly,
S. M. FELTON,
Supt. Fitchburg Railroad.

New York, March 11, 1850.

I have used the Patent India-rubber Spring purchased of Mr. Ray, upon the cars of the New York and New Haven Railroad, and have found them efficient and economical; and when applied to the axles and draw springs, believe them to be quite equal to any in use. I have found a combination of these springs with a steel spring under the transom beam a very satisfactory arrangement, and am now using this plan in all new cars.

Yours respectfully,
ROBERT SCHUYLER.

February 25, 1850.

From practical observation of the use of the India-rubber Car Springs, manufactured and sold by your company, we are entirely satisfied in their application, and do not hesitate to recommend them as elastic, durable, requiring no repairs for years, and retaining their consistency during all extremes of weather. We have applied them for the past two years, and consider them superior for all railroad purposes.

Yours truly,

OSGOOD BRADLEY, Car Builder, Worcester.
T. & C. WASON, do. Springfield.
DEAN, PACKARD & MILLS, do. do.
DAVENPORT & BRIDGES, do. Cambridgeport.

Office New Jersey Railroad Co.,
Jersey City, March 8, 1850.

FOWLER M. RAY, Esq.,

Dear Sir: In answer to your enquiries respecting the operation of the Vulcanised Rubber Springs, purchased by our company from you some two years since, I reply that they are superior to any spring in use, (that I have either seen or heard of).

The improved form of your spring, consisting of a solid piece of vulcanised rubber with bands on the outside, is far superior to your first form, consisting of disks of rubber with metallic plates interposed.

The last named form was tried, if you recollect, at a much earlier period; and then was replaced by your last form.

I have no hesitation in saying that your springs have given entire satisfaction, and most cheerfully recommend them to railroad companies throughout the country for the following reasons:

- 1st. The cost is 30 per cent. less.
- 2d. Saving of weight on each car of 8 wheels from 700 to 800 lbs.
- 3d. Less care and attention is required, as they are not liable to get out of repair.
- 4th. A great saving is secured in the wear and tear of the cars and rails from their great elasticity.
- 5th. The freedom from noise.
- 6th. There is greater safety in case of accident, as they cannot be broken.
- 7th. The comfort of passengers is enhanced sufficiently to pay the expense, waiving all the other reasons that I have given.

Should this fail to satisfy any person enquiring, you are at liberty to refer to me, No. 150 Washington St., Jersey City.

Yours respectfully,

T. L. SMITH, Supt.

Old Colony Railroad Office,
Boston, March 6, 1850.

EDWARD CRANE, Esq.,

President New England Car Co.,

Dear Sir: In compliance with your request I would state that the Old Colony Railroad Compy have had in use upon their road, India-rubber Springs furnished by your company, for more than eighteen months past, during which time they have been extensively used under Passenger and Freight Cars, Locomotive Tenders, and for Drawer and Buffing Springs, with the most perfect success. The elasticity and consistency of the Rubber has never been unfavorably affected by either extremes of heat or cold—and from the experience which we have had in the use of Rubber Springs, I think them well adapted for railroad purposes—and therefore we have for some months past used Rubber almost exclusively, in all places where springs are required.

Respectfully yours, etc.,

JAS. H. MOORE,
Supt. O. C. Road.

Troy, February 27, 1850.

We have been using your India-rubber Car Springs for nearly two years—and we take pleasure in saying that in our opinion the rubber has to a certain extent already, and may eventually entirely supersede all other Springs for Railroad Car purposes. We now use it entirely for Draw Springs and Bumpers, considering it better and lighter than steel.

During our two years' experience in the use of it, we have not known any to lose their elasticity, or fail in any way; and we cheerfully recommend the rubber for railroad car springs.

Very respectfully,

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February 9, 1850.

6m*

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February 3, 1849.

Iron Store.

THE Subscribers, having the selling agency of the
following named Rolling Mills, viz: Norristown,
Rough and Ready, Kensington, Trindaphia, Potts-
grove and Thorndale, can supply Railroad Companies,
Merchants and others, at the wholesale mill prices for
bars of all sizes, sheets cut to order as large as 58 in.
diameter; Railroad Iron, domestic and foreign; Loco-
motive tire welded to given size; Chairs and Spikes;
Iron for shafting, locomotive and general machinery
purposes; Cast, Shear, Blister and Spring Steel; Bol-
der rivets; Copper; Pig Iron, etc., etc.

MORRIS, JONES & CO.,

Iron Merchants,

Schuylkill 7th and Market Sts., Philadelphia.

August 16, 1849.

1y33

Railroad Iron.

THE MOUNT SAVAGE IRON WORKS, AL-
legany county, Maryland, having recently pass-
ed into the hands of new proprietors, are now prepar-
ed, with increased facilities, to execute orders for any
of the various patterns of Railroad Iron. Commu-
nications addressed to either of the subscribers will have
prompt attention. J. F. WINSLOW, President

Troy, N.Y.

ERASTUS CORNING, Albany

WARREN DELANO, Jr., N.Y.

JOHN M. FORBES, Boston.

ENOCH PRATT, Baltimore, Md.

November 6, 1848.

Railroad Iron.

THE SUBSCRIBERS ARE PREPARED TO
take orders for Railroad Iron to be made at their
Phoenix Iron Works, situated on the Schuylkill Riv-
er, near this city, and at their Safe Harbor Iron Works,
situated in Lancaster County, on the Susquehanna
river; which two establishments are now turning out
upwards of 1800 tons of finished rails per month.

Companies desirous of contracting will be promptly
supplied with rails of any required pattern, and of the
very best quality.

REEVES, BUCK & CO.,

45 North Water St., Philadelphia,

March 15, 1849.

Monument Foundry.

A. & W. DENMEAD & SON,
Corner of North and Monument Sts.,—Baltimore,

HAVING THEIR

IRON FOUNDRY AND MACHINE SHOP

In complete operation, are prepared to execute faithfully and promptly, orders for Locomotive or Stationary Steam Engines, Woolen, Cotton, Flour, Rice, Sugar Grist, or Saw Mills,

Slide, Hand or Chuck Lathes, Machinery for cutting all kinds of Gearing. Hydraulic, Tobacco and other Presses, Car and Locomotive patent Ring Wheels, warranted,

Bridge and Mill Castings of every description, Gas and Water Pipes of all sizes, warranted, Railroad Wheels with best faggoted axle, furnished and fitted up for use, complete

Being provided with Heavy Lathes for Boring and Turning Screws, Cylinders, etc., we can furnish them of any pitch, length or pattern.

Old Machinery Renewed or Repaired—and Estimates for Work in any part of the United States furnished at short notice.

June 8, 1849.

Iron Wire.

REFINED IRON WIRE OF ALL KINDS,
Card, Reed, Cotton-flyer, Annealed, Broom, Buckle, and Spring Wire. Also all kinds of Round, Flat or Oval Wire, best adapted to various machine purposes, annealed and tempered, straightened and cut any length, manufactured and sold by

ICHABOD WASHBURN.

Worcester, Mass., May 25, 1849.

American and Foreign Iron.

FOR SALE,

300 Tons A 1, Iron Dale Foundry Iron.
100 " 1, " " "
100 " 2, " " "
100 " " Forge " "
400 " Wilkesbarre " "
100 " "Roaring Run" Foundry Iron.
300 " Fort " "
50 " Catoctin " "
250 " Chikiswalungo " "
50 " "Columbia" "chilling" iron, a very superior article for car wheels.
75 " "Columbia" refined boiler blooms.
30 " 1 x 1/2 Slit iron.
50 " Best Penna. boiler iron.
50 " "Puddled" " "
50 " Bagnall & Sons refined bar iron.
50 " Common bar iron.

Locomotive and other boiler iron furnished to order.

GOODHUE & CO.,

New York. 64 South street

American Pig, Bloom and Boiler Iron.

HENRY THOMPSON & SON,
No 57 South Gay St., Baltimore, Md.,
Offer for sale, Hot Blast Charcoal Pig Iron made at the Catoctin (Maryland), and Taylor (Virginia), Furnaces; Cold Blast Charcoal Pig Iron from the Cloverdale and Catawba, Va., Furnaces, suitable for Wheels or Machinery requiring extra strength; also Boiler and Flue Iron from the mills of Edge & Hilles in Delaware, and best quality Boiler Blooms made from Cold Blast Pig Iron at the Shenandoah Works, Va. The productions of the above establishments can always be had at the lowest market prices for approved paper.

American Pig Iron of other brands, and Rolled and Hammered Bar Iron furnished at lowest prices. Agents for Watson's Perth Amboy Fire Bricks, and Rich & Cos. New York Salamander Iron Chests.

Baltimore, June 14, 1849. 6 mos

Wheel, Forge and Foundry Iron.

LOCUST GROVE Wheel Iron of great strength and superior chilling property.
Balt. Charcoal Forge Iron, from Patuxent, Curtis Creek and Gunpowder furnaces.

Elkridge Foundry Iron, of superior strength and softness. Anthracite and Charcoal Iron from Pennsylvania and Virginia. Gas and Water Pipes, Lamp Posts from Elkridge furnace.

LEMMON & GLENN,

6m9 62 Buchanan's Wharf, Baltimore.

Iron.

THE SUBSCRIBERS having resumed the agency of the New-Jersey Iron Company, are prepared to execute orders for the different kinds and sizes of Iron usually made at the works of the company, and offer for sale on advantageous terms.—

150 tons No. 1 Boonton Foundry Pig Iron.
100 " No. 2 do. do.
300 " Nos. 2 & 3 Forge do. do.
100 " No. 2 Glendon do. do.
140 " Nos. 2 & 3 Lehigh Crane do do.
100 " No. 1 Pompton Charcoal do.
100 " New-Jersey Blooms
50 " New-Jersey Faggoting Iron, for shafts
Best Bars, 1/2 to 4 inch by 1/2 to 1 inch thick.
Do do Rounds and Squares, 1/2 to 3 inch.
Rounds and Squares, 3-16 to 1 inch.
Half Rounds, 1/2 to 1 in. Ovals & Half Ovals 1/2 to 1 1/2 in.
Bands, 1/2 to 4 inch. Hoops, 1/2 to 2 inch.
Trunk Hoops, 1/2 to 1 1/2 in. Horse Shoe & Nut Iron.
Nail Plates. Railroad Spikes.

DUDLEY B. FULLER & Co., 139 Greenwich-st. and 85 Broad-st.

WILLIAM JESSOP & SONS' CELEBRATED CAST-STEEL.

The subscribers have on hand, and are constantly receiving from their manufactory,

PARK WORKS, SHEFFIELD,

Double Refined Cast Steel—square, flat and octagon. Best warranted Cast Steel—square, flat and octagon. Best double and single Shear Steel—warranted. Machinery Steel—round.

Best and 2d gy. Sheet Steel—for saws and other purposes.

German Steel—flat and square, "W. I. & S." "Eagle" and "Goat" stamps.

Genuine "Sykes," L Blister Steel.

Best English Blister Steel, etc., etc., etc.

All of which are offered for sale on the most favorable terms by

WM. JESSOP & SONS,

91 John street, New York.

Also by their Agents—

Curtis & Hand, 47 Commerce street, Philadelphia.

Alex'r Fullerton & Co., 119 Milk street, Boston.

Stickney & Beatty, South Charles street, Baltimore.

May 6, 1848.

JOHNSON, CAMMELL & Co's Celebrated Cast Steel,

AND

ENGINEERING AND MACHINE FILES,
which for quality and adaptation to mechanical uses, have been proved superior to any in the United States. Every description of square, octagon, flat and round cast steel, sheet, shovel and railway spring steel, best double and single shear steel, German steel, flat and square, goat stamps, etc. Saw and file steel, and steel to order for any purposes, manufactured at their Cyclops Steel Works Sheffield.

JOHNSON, CAMMELL & CO.,

100 William St., New York.

November 23 1849.

Railroad Iron.

OF ANY PATTERN AND WEIGHT,
Of a Favorite Brand,

And deliverable in Bond, or Duty paid, at any Port of the U. S., contracted for on favorable terms, by

CHARLES ILLIUS,

20 Beaver St., New York.

Pig and other Iron also contracted for. Sole Agent for "Baxter's Machine and Burning Oil"—particularly adapted for "Railroads" and other Machinery—Preferred to Sperrin by the many now using it, and 25 per cent. cheaper.

CUT NAILS OF BEST QUALITY, BAR IRON
(including Flat Rails) manufactured and for sale by
FISHER, MORGAN & CO.,
75 N. Water St., Philadelphia.

Ogden & Martin's ROSENDALE CEMENT.

WE are prepared to enter into arrangements for supplying our Cement for public works or other purposes. We warrant the cement equal in every respect to any manufactured in this country. It attains a great degree of hardness, sets immediately under water, and is a superior article for masonry coming in contact with water, or requiring great strength.

For sale in tight barrels, well papered, at their office by
OGDEN & MARTIN, 104 Wall st.

February 16, 1850.

The above cement is used in most of the fortifications building by government.

To Steam Engine Builders.

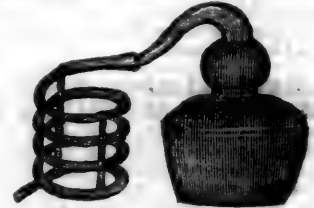
THE Undersigned offer for sale, at less than half its cost, the following new machinery, calculated for an engine of 62 inches cylinder and 10 feet stroke, viz.

2 Wrought Iron Cranks, 60 inches from centre to centre.
1 Do. do. Connecting Rod Strap.
2 Do. do. Crank Pins.
1 Eccentric Strap.
1 Diagonal Link with Brasses.
1 Cast Iron Lever Beam (forked).

The above machinery was made at the West Point Foundry for the U. S. Steamer Missouri, without regard to expense, is all finished complete for putting together, and has never been used. Drawings of the cranks can be seen on application to

HENRY THOMPSON & SON,
No. 57 South Gay St., Baltimore, Md.

Sept. 12, 1849.

**P. H. Griffin,**

Corner of Steuben and James Sts. Albany, N.Y.
CONTINUES to manufacture copper flues for locomotive boilers, brewers' coppers, stills, tanner heaters, etc. Copper work in general, at the shortest notice. He has constantly on hand brass cocks, brass valves, copper pumps of every variety.

Orders promptly attended to. ly14

To Railroad Companies.

FOR SALE—A Second-hand Locomotive Engine and Tender, of about 10 tons weight, in good order, and warranted to perform well. Any company wanting a cheap engine for a passenger or light burden train, will rarely meet with an opportunity so favorable as the present. The engine and tender are in perfect running order, and will be tested to the satisfaction of any one wishing to purchase. Price \$1,500.

Address **J. B. MOORHEAD,**

Frazer P.O., Chester county, Pa.

P.S.—The Engine can be seen by calling on H. Osmond & Co., Car-builders, Broad st., Philadelphia.
September 6, 1849.

India-rubber for Railroad Cos.

RUBBER SPRINGS—Bearing and Buffer—Fuller's Patent—Hose from 1 to 12 inches diameter. Suction Hose. Steam Packing—from 1-16 to 2 in. thick. Rubber and Gutta Percha Bands. These articles are all warranted to give satisfaction, made under Tyer & Helm's patent, issued January, 1849.—No lead used in the composition. Will stand much higher heat than that called "Goodyear's," and is in all respects better than any in use. Proprietors of railroads do not be overcharged by pretenders.

HORACE H. DAY,

Warehouse 23 Courtlandt street.

New York, May 21, 1849.

To Railroad Companies and Contractors.

FOR SALE—Two Locomotive Engines and Tenders, at present in use on the Beaver Meadow Railroad, being too light for their coal trains, but well calculated for either gravel or light passenger trains.

They weigh, in running order, about 8 tons each—having one pair of driving wheels 4 feet diameter, 4 truck wheels 30 inches diameter, with cylinders 10 in. diameter, and 13 inches stroke of piston. Tenders on 4 wheels. Address **JAMES ROWLAND,**

Prest. Beaver Meadow Railroad & Coal Co.,

Philadelphia.

or, **L. CHAMBERLAIN, Sec'y,**

at Beaver Meadow, Pa.

May 19, 1849.

Rosendale Cement.

THE NEWARK AND ROSENDALE LIME AND CEMENT CO. are now manufacturing at their works in NEWARK, N. J., and Ulster county, N.Y., a very superior article of Hydraulic Cement—also Lime Calcine Plaster, etc. Contractors and dealers will find it to their advantage to call or make application before purchasing elsewhere. All communications addressed to the subscriber, at Newark, N.J., will be punctually attended to.

ly*16 **HENRY WILDE, Secretary.**

Fire Brick.

THE Subscribers have constantly on hand Rafford's Stourbridge, Oak Farms Stourbridge, Lister, Wortley, Red and White Welsh Fire Bricks, common and fancy shapes. Also,

ROOFING SLATES,

from the best Welch quarries, and of all sizes. Also, COAL,

of all kinds—Liverpool Orrell and Cannel, Scotch, New Castle, Pictou, Sidney, Cumberland, Virginia, and all kinds of Anthracite coals. Also,

Pig Iron, Salt, etc., etc., for sale at the lowest market price. Apply to

SAMUEL THOMPSON & NEPHEW,
275 Pearl and 43 Gold Sts., New York.

November, 23, 1849.

Ballard's Improved JACK-SCREW.

PATENTED.

THE ADVANTAGES OF THIS Screw for Stone Quarries, Railroads, Steam Boiler Builders, and for other purposes are superior to any other similar machine.

The improvement consists in being able to use either end of the screw, as occasion requires.

It is capable of raising the heaviest Locomotive with ease, being portable, strong and powerful, and not likely to get out of order.

Many Railroad Companies and Boiler Makers have them in use—by whom they are highly recommended.

JACK SCREWS, of various sizes, power and price, constantly on hand at the manufactory.

No. 7 Eldridge Street,
near Division Street.

New York, Jan. 19, 1850.

**To the Proprietors of Rolling Mills and Iron Works.**

THE Undersigned—Proprietors of Townsend's Furnace and Machine Shop, Albany—are extensively engaged in the manufacture of Machinery and fixtures for Iron, and Copper Rolling Mills, and Iron Works. Having paid particular attention to the manufacture of *Rolls* (Rollers), both *chilled* and *dry-sand*, they feel confident that they can execute orders for such castings in a satisfactory manner. And to give assurance of this, they beg leave to refer to the following named persons, proprietors and managers of some of the most extensive rolling mills in the country, viz: Jno. F. Winslow, J. Tuckerman, H. Burden, W. Burt, J. & J. Rogers, Salsus & Co., J. B. Bailey, L. G. B. Cannon, Hawkins & Atwater, etc., etc.

F. & T. TOWNSEND.

Albany, August 18, 1849.

Brown's Old Established SCALE WARE HOUSE,

NO. 234 WATER ST., NEW YORK.

THE Subscriber, Practical Manufacturer of Scales of every description, respectfully asks the attention of Railroad Companies to his Improved Wrought Iron Railroad Track and Depot Scales which for strength, durability, accuracy, convenience in weighing, and beauty of workmanship, are not surpassed by any others in this country.

He is aware that this is rather a bold assertion for him to make, yet he can say with confidence that they have but to be tried to give them precedence over all others.

J. L. BROWN.

Bank Scales made to order, and all Scales of his make Warranted in every particular.

References given if required.

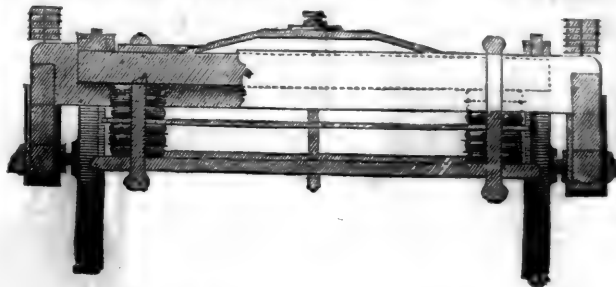
4tf

THE NEWCASTLE MANUFACTURING Co. continue to furnish at the Works, situated in the town of Newcastle, Del., Locomotive and other steam engines, Jack Screws, Wrought Iron Work and Brass and Iron Castings, of all kinds connected with Steam-boats, Railroads, etc.; Mill Gearing of every description; Cast Wheels (chilled) of any pattern and size, with Axles fitted, also with wrought tires, Springs, Boxes and bolts for Cars; Driving and other wheels for Locomotives.

The works being on an extensive scale, all orders will be executed with promptness and despatch. Communications addressed to Mr. William H. Dobbs, Superintendent, will meet with immediate attention.

ANDREW C. GRAY,

President of the Newcastle Manuf. Co.

FULLER'S PATENT INDIA RUBBER CAR SPRINGS.

RAILROAD COMPANIES are cautioned, before purchasing Springs, to examine the actual patents and judge for themselves.

Persons, under the Title of the New England Car Company, seeking fraudulently to invade Fuller's rights have put forth so many statements for the purpose of misleading the public, that an enumeration of some facts is absolutely necessary, for the purpose of putting persons interested upon their guard.

Fuller's patent is for the application of Discs of India-rubber with Metal Plates, for forming Springs for Railway Cars and Carriages—either one disc and two plates, or ten discs and plates, or any other number, are equally covered by the patent. Fuller is not bound to the use of short discs—he may use long discs and plates.

Ray's patent is simply and wholly the forming of air tight rubber cylinders, with hoops or bands round the outside, and the combination of elasticity of India rubber, with the elasticity of atmospheric air confined in the cylinder, and in no part of his patent is he authorized to use the form of spring which he is now fraudulently supplying to Railroad Companies. Such springs are direct and positive infringements of the very letter of Fuller's patent.

Fuller's patent is dated October, 1845, Ray's patent, August, 1848.

The spring patented by Ray never has been put in operation, and never can be made useful for Railroad cars.

A mere experiment, even if made, it is well known does not prove an invention; and it is ridiculous for such parties to hope to mislead the Presidents and Superintendents of Railroad companies, by claiming the invention because Ray alleges he made an experiment—which Fuller had made before him—had actually brought into working order, and obtained a patent for—and this too before Mr. Ray states he made his experiment—and that experiment not claimed to have been applied to a car or carriage.

Besides, the invention could not have been developed until India rubber, properly Vulcanised, could be made of a sufficient thickness. In the United States the art of vulcanising rubber by steam heat, (by which

means only can a body of rubber having any considerable thickness be vulcanised,) was not introduced until after the grant by the American government of the patent for springs to Fuller—whereas the process of vulcanising rubber by steam heat was invented in England about three years previously, and was used by Fuller there. This fact refutes entirely the claim of invention put forth by Mr. Ray, and proves the impossibility of his pretensions being true.

Fuller was the first and only inventor of the spring. A Mr. Dorr, whose connection with Mr. Goodyear is well known in this country, applied in England to Mr. Fuller, after he had published and patented his invention, and introduced another party for the purpose of obtaining the agency for the United States. They were furnished with a complete set of drawings and models, and with instructions to make arrangements for the supply of material of American manufacture—from that hour to the present not a single communication has been received from them. Some of these identical models have been traced into the hands of parties now seeking to invade Fuller's rights, and who have exhibited them as specimens of their own invention.

After this, the conveyance was made by Goodyear to certain parties here for the use for railroad springs of what he calls his Metallic rubber. Comment is unnecessary.

There are 5 or 6 different processes for the manufacture of vulcanised rubber, patented by as many different parties, some here, some in England, either of which would, probably make good springs.

A large and powerful company has been organised under Fuller's patent, the particulars of which shall be given.

An action has been commenced against three railroad companies for infringement; and all other parties will assuredly be prosecuted if they continue farther to infringe upon Fuller's patent.

W. C. FULLER,

The only persons authorised to supply the Springs are
G. M. KNEVITT, 38 Broadway, N. York,
General Agent for the U. S.; and
JAS. LEE & Co., 18 India Wharf, Boston.
JOHN THORNLEY, Chestnut st., Philad.

Patent India Rubber Steam Packing.

THIS article, made by the subscriber, who alone is authorised to make it, is warranted to stand as high a degree of heat as any that has been or can be made by any person—and is the article which has made the reputation of India Rubber Steam Packing and the demand therefor. A large assortment of all thick nesses requisite for any description of engines, steam pipes, valves, etc., constantly on hand and for sale by the manufacturer and patentee, who will give every information regarding its properties, mode of use, etc. at the warehouse.

JOHN GREACHEN, JR.,
93 Broadway, opposite Trinity Church.
New York, October, 1849.

Ibbotson, Brothers & Co's CELEBRATED CAST STEEL

AND

Best Cast Steel Royal Improved Files, well known as better adapted for Engineers' and Machinists' purposes than any now in use in the United States.

Every description of Square, Octagon, Flat and Round Cast Steel, Sheet, Shovel and Railway Spring Steel, etc., and Steel to order for any purpose—manufactured at their works in Sheffield—and universally known by the old stamp "Globe."

HENRY J. IBBOTSON, Agent,
218 Pearl st., New York.

February 25, 1850.

FAIRBANKS' RAILROAD SCALES.—THE

subscribers are prepared to construct at short notice, Railroad and Depot Scales, of any desired length and capacity. Their long experience as manufacturers—their improvements in the construction of the various modifications, having reference to strength, durability, retention of adjustment, accuracy of weight and dispatch in weighing—and the long and severe tests to which their scales have been subjected—combine to ensure for these scales the universal confidence of the public.

No other scales are so extensively used upon railroads, either in the United States or Great Britain—and the managers refer with confidence to the following in the United States.

Eastern Railroad.	Boston & Maine Railroad.
Providence Railroad.	Providence and Wor. Road.
Western Railroad.	Concord Railroad.
Old Colony Railroad.	Fitchburg Railroad.
Schenectady Railroad.	Syracuse and Utica Road.
Balt. and Ohio Railroad.	Baltimore and Susq. Road.
Phila. & Reading Road.	Schuylkill Valley Road.
Central (Ga.) Railroad.	Macon and Western Road.
	New York and Erie Railroad.

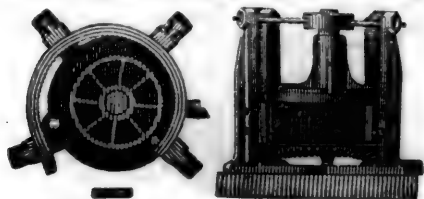
And other principal Railroads in the Western, Middle and Southern States.

E. & F. FAIRBANKS & CO.

St. Johnsbury, Vt.
Agents, } FAIRBANKS & Co., 81 Water St., N. York.
A. B. NORRIS, 196 Market St. Philadelphia.
April 22, 1849. 1y*17

MACHINERY.

Henry Burden's Patent Revolving Shingling Machine.



THE Subscriber having recently purchased the right of this machine for the United States, now offers to make transfers of the right to run said machine, or sell to those who may be desirous to purchase the right for one or more of the States.

This machine is now in successful operation in ten or twelve iron works in and about the vicinity of Pittsburgh, also at Phoenixville and Reading, Pa., Covington Iron Works, Md., Troy Rolling Mills, and Troy Iron and Nail Factory, Troy, N. Y., where it has given universal satisfaction.

Its advantages over the ordinary Forge Hammer are numerous: considerable saving in first cost; saving in power; the entire saving of shingler's, or hammerman's wages, as no attendance whatever is necessary, it being entirely self-acting; saving in time from the quantity of work done, as one machine is capable of working the iron from sixty puddling furnaces; saving of waste, as nothing but the scoria is thrown off, and that most effectually; saving of staffs, as none are used or required. The time required to furnish a bloom being only about six seconds, the scoria has no time to set, consequently is got rid of much easier than when allowed to congeal as under the hammer. The iron being discharged from the machine so hot, rolls better and is much easier on the rollers and machinery. The bars roll sounder, and are much better finished. The subscriber feels confident that persons who will examine for themselves the machinery in operation, will find it possesses more advantages than have been enumerated. For further particulars address the subscriber at Troy, N. Y. P. A. BURDEN.

Railroad Spikes and Wrought Iron Fastenings.

THE TROY IRON AND NAIL FACTORY, exclusive owner of all Henry Burden's Patented Machinery for making Spikes, have facilities for manufacturing large quantities upon short notice, and of a quality unsurpassed.

Wrought Iron Chairs, Clamps, Keys and Bolts for Railroad fastenings, also made to order. A full assortment of Ship and Boat Spikes always on hand.

All orders addressed to the Agent at the Factory will receive immediate attention.

P. A. BURDEN, Agent,
Troy Iron and Nail Factory, Troy, N. Y.

RAILROAD WHEELS.

CHILLED RAILROAD WHEELS.—THE UNDERSIGNED are now prepared to manufacture their Improved Corrugated Car Wheels, or Wheels with any form of spokes or discs, by a new process which prevents all strain on the metal, such as is produced in all other chilled wheels, by the manner of casting and cooling. By this new method of manufacture, the hubs of all kinds of wheels may be made whole—that is, without dividing them into sections—thus rendering the expense of banding unnecessary; and the wheels subjected to this process will be much stronger than those of the same size and weight, when made in the ordinary way.

A. WHITNEY & SON,
Willow St., below 13th,
Philadelphia, Pa.

CHILLED RAILROAD WHEELS.—THE UNDERSIGNED, the Original Inventor of the Plate Wheel with solid hub, is prepared to execute all orders for the same, promptly and faithfully, and solicits a share of the patronage for those kind of wheels which are now so much preferred, and which he originally produced after a large expenditure of time and money.

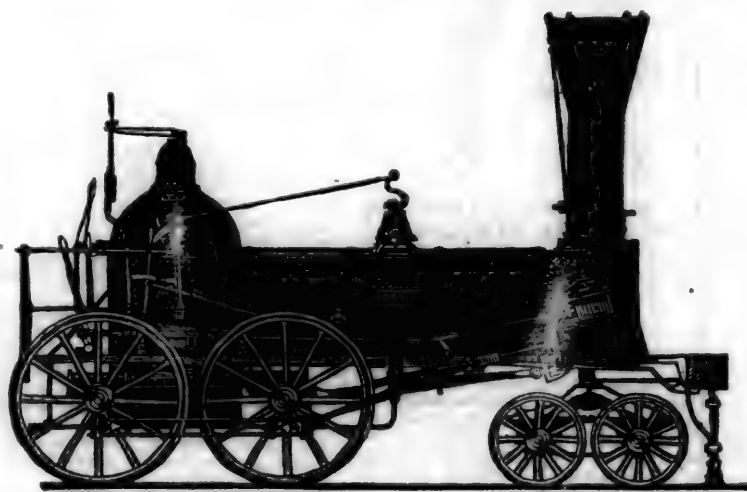
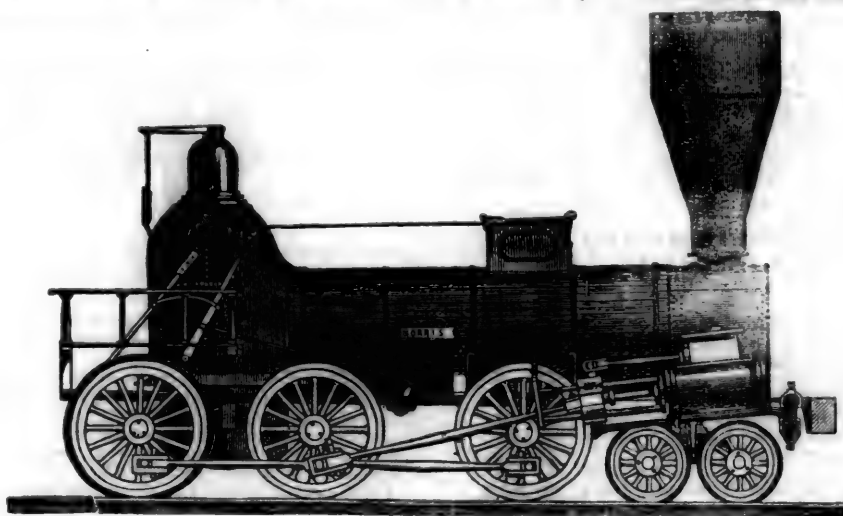
A. TIERS,
Point Pleasant Foundry.

He also offers to furnish Rolling Mill Castings, and other Mill Gearing, with promptness, having, he believes, the largest stock of such patterns to be found in the country.

Kensington, Philadelphia Co.,
March 12, 1848.

NORRIS' LOCOMOTIVE WORKS.

BUSHHILL, SCHUYLKILL SIXTH-ST., PHILADELPHIA,



THE UNDERSIGNED Manufacture to order Locomotive Steam Engines of any plan or size. Their shops being enlarged, and their arrangements considerably extended to facilitate the speedy execution of work in this branch, they can offer to Railway Companies unusual advantages for prompt delivery of Machinery of superior workmanship and finish.

Connected with the Locomotive business, they are also prepared to furnish, at short notice, Chilled Wheels for Cars of superior quality.

Wrought Iron Tyres made of any required size—the exact diameter of the Wheel Centre, being given, the Tyres are made to fit on same without the necessity of turning out inside.

Iron and Brass castings, Axles, etc., fitted up complete with Trucks or otherwise.

NORRIS, BROTHERS

LAWRENCE'S ROSENDALE HYDRAULIC Cement. This Cement is warranted equal to any manufactured in this country, and has been pronounced superior to Francis' "Roman." Its value for Aqueducts, Locks, Bridges, Flooms, and all Masonry exposed to dampness, is well known, as it sets immediately under water, and increases in solidity for years. For sale in lots to suit purchasers, in tight papered barrels, by

JOHN W. LAWRENCE,
142 Front-street, New York.

Orders for the above will be received and promptly attended to at this office. 32 ly.

PATENT MACHINE MADE HORSE-SHOES.

The Troy Iron and Nail Factory have always on hand a general assortment of Horse Shoes, made from Refined American Iron.

Four sizes being made, it will be well for those ordering to remember that the size of the shoe increases as the numbers—No. 1 being the smallest.

P. A. BURDEN, Agent,
Troy Iron and Nail Factory, Troy, N. Y.

COLUMBUS, OHIO, Railroad Car Manufactory. RIDGWAYS & KIMBALL,

HAVE established at this central point, the manufacture of Passenger, Freight, Gravel and Hand Cars for Railroads, and assure all Western Railroad Companies that it will be their constant aim to procure the best materials and workmen, and to turn out the best kind of work at fair prices. Specimens may be seen on the Columbus and Xenia Railroad. The patronage of Railroad Companies is respectfully solicited. 1y3

To Inventors and Patentees.

OWEN G. WARREN, ARCHITECT, Has had many years' experience as Agent for obtaining Patents, both in this country and Europe, and will transact such business promptly and reasonably. Persons at a distance can have their business done by correspondence—without the necessity of visiting this city or Washington. Office No. 94 Merchants Exchange, Wall st., corner of Hanover st., up stairs, 1y3

AMERICAN RAILROAD JOURNAL.

STEAM NAVIGATION, COMMERCE, MINING, MANUFACTURES.

HENRY V. POOR, Editor.

ESTABLISHED 1831.

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ASSISTANT EDITORS,

J. T. HODGE, *For Mining and Metallurgy.*
GEN. CHAS. T. JAMES, *For Manufactures and the
Mechanic Arts.*
M. BUTT HEWSON, C. E., *For Civil Engineering.*

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South Carolina.

The iron ores of this State occur in its northern part among the spurs of the Allegheny mountains. They are principally contained in a narrow belt of slates, which pursue a northeast and southwest course through parts of York, Union and Spartanburg districts, crossing Broad river at the Cherokee Ford. With the mica slates are associated beds of limestone as in all the hematite districts of the Atlantic States. These limestones crop out along the line of an anticlinal axis, the slates on the north side dipping to the northwest, and on the south side to the southeast at angles varying from 45° to 80°.

For the description of this region, as well as the map accompanying it, I am indebted to the Report on the Geological Survey of the State, by M. Tuomey, Esq. According to this report, the metalliferous portion of these rocks is limited to a length of only from six to eight miles. The ores consist of the three varieties—*magnetic, specular and hematite*, all conveniently associated together, and in

close proximity to beds of limestone. The country is hilly, rising boldly from the banks of the streams by which it is well watered. These also afford convenient privileges for the establishment of works in the immediate neighborhood of the mines. The surface appears to be well wooded from the fact that charcoal is rated at only from two and a half to 4 cents per bushel.

The principal localities of the different ores are designated on the map by appropriate letters. The *magnetic oxide* is described as occurring in a band of talcose slate, whose greatest width is within half a mile. As in the other States, where this ore occurs, so here it is found to conform to the stratification of the rocks which contain it, but with degrees of thickness varying between great extremes.—Though subject to these irregularities, instances are wanting elsewhere of a bed or vein thinning out together, as Mr. Tuomey considers they sometimes do in this region. A thin seam in other places usually conducts the miner to another swelling out of the vein; and when its continuity is interrupted by a dyke or horse or cap, it is again found beyond, though it may be thrown out of its course. The slates are often penetrated with the ore, and thin layers of them separate two parallel beds of ore, so that one might be worked to great extent without any indication of the close proximity of another.

The workings so far are superficial; no advantage has as yet been taken of the rapid ascent of the hills near the water courses, to drive in upon the veins from their level.

The ore seems to vary in quality at the different openings near the river; some of it is hard and compact, difficult to work; and some is loose and friable, black and granular and highly magnetic. The quantity is very great, and the expense of raising it is moderate.

From the North Carolina line the range of the limestone is very regular toward the southwest till it reaches Dear Little Creek. Here it seems to be thrown off toward the north; and in the break are interposed the talcose slates containing the magnetic ores; as if these by their igneous agency had been the cause of the disturbance. The talcose slates rest against the limestone dipping towards the southeast. Above them are beds of mica slate forming the northern slopes of Kings mountain, which have the same inclination; while over the other side of the limestone-axis, to the northwest,

mica slate is again seen next this rock with no talcose slates interposed, dipping in the contrary direction—to the northwest.

This mica slate on both sides of the axis is the repository of a variety of ore which appears to be specular and magnetic ore mixed; it is of dark color frequently, and is somewhat magnetic, but gives a red powder. It appears on the north side of Gelky's mountain in considerable quantity, and again near the furnace on People's creek. Mr. Tuomey regards this ore as passing from the red peroxide at the surface to grey and magnetic ores below, and still farther down to pyritous iron ore, if not to sulphuret of iron.

Near King's Mountain Iron works, on Dear Little Creek, are other outcrops on the same range of ore. These are on the east side of Broad river.—They have furnished a large amount of ore to these works.

At the "Bird Bank," on the Meadow Branch of King's Creek, the same ore is found interstratified with the mica slates. Its quantity is very great; its color is black, with thread like veins of quartz running through it.

The Hardin bank is directly west of this, on Jumping branch. The ore lies in a bed of regular dimensions from three to four feet thick, dipping 45° to 80° toward the northwest. It is of slatiform structure, the seams running with those of the mica slate. "Near the surface the ore consists of red and yellow ochres, with harder portions, giving a brown powder and streak—being portions of the bed, that have assumed the form of the hydrous peroxide or limonite (hemotite). For about 20 feet below the surface these ores continue the same;—but below that they are grey, showing however, when indented by the hammer, a reddish streak. They are also to some extent magnetic. At water level pyrites makes its appearance; and even native sulphur is found coating the surface of the fissures in the ore,

The ore is not compact but rather composed of small, slightly cohering grains, having a gray dull lustre, excepting where it has been crushed, and there the red powder of the specular oxides is seen.

After a careful examination of the ore of this bed, I am fully convinced that it was originally a sulphuret of iron, or what is known at the mines as iron pyrites; and that if it be pursued to a sufficient depth, it will terminate in that mineral. The shaft sunk on the bed is at present about 50 feet in

depth, which is about the level of natural drainage—so that it is placed beyond atmospheric influences.

It is not a little curious that pyrites will resist decomposition when placed under water, while if it be exposed to the atmosphere, it is readily acted upon, and reduced to an oxide. Nearly every gold mine in the State offers examples in illustration of this fact. For, wherever oxide of iron is found mingled with the ores, when water is reached it is invariably found in the form of iron pyrites. At the depth mentioned above, the bed is mixed with iron pyrites, and the ore may be traced through every stage, to the red oxide, of which the bed is composed near the surface.

We have first the sulphuret or iron pyrites, which by decomposition, becomes probably the protoxide, a portion of which combines with another atom of oxygen and forms peroxide, the mixture of the two now existing together, producing the magnetic oxide. The remaining protoxide is converted into peroxide, and the whole is now the specular oxide or red ore which we find towards the surface. And if, during this change, water enter into combination with the ore, we shall have the hydrous peroxide or brown ore, which, I have already remarked, is found in this mine. Every step in this process may in like manner be observed at the furnace bed, on People's creek.

With these facts before one, and supported as they are by numerous analogies in other mines, it is impossible to avoid the conclusion that these ores are the result of the decomposition of iron pyrites.*

I have been led into this long quotation from the peculiarity of the facts to this neighborhood, at least so far as respects iron mines. The analogies in other mines referred to by the author are no doubt the ferruginous veins containing gold, which I have myself noticed in North Carolina becoming pyritous below the water level. And so the veins of copper ores, which I have seen in Cuba and elsewhere producing carbonates and oxides at the surface, turn to sulphurets below, all which has been generally ascribed to the decomposing atmospheric influences. If these veins of iron ore are of similar character, then their productiveness is limited to the portion of the veins lying above the water level; and this will depend upon the nature of the surface. As the land appears to be hilly, where the ores are found, it is probable that large quantities may long be obtained unmixed with sulphur.

Hematite is of frequent occurrence in these rocks, particularly in Spartanburg and Pickens districts. The latter is the very mountainous district in the northwest corner of the State. Mr. Tuomey notices the following localities of this ore. On the Pacolet, a stream which enters Broad river on the west side, a little to the south of the limits of the map. Here it is found in uncertain quantities four miles north of the furnace on this stream.—This furnace has been supplied wholly with hematite. Near the Cowpens furnace on the western border of the map, it is abundant, and so continues many miles west. It is the only ore used by this furnace. Near Cherokee Ford it is found of good quality; and so at many other localities noted in the work it appears to be abundant, but little used. Being on the gold range some of the hematites are auriferous. I do not quote the analyses of these ores, as they appear to be made without reference to some of the universal constituents of the ore.

On Crooked creek in Pickens district it is found

—a compact clean ore, working freely and making good iron; it was formerly worked in a bloomery fire.

Mr. Tuomey met with a vein of this ore associated with a quartz vein containing crystals of schorl, which though unimportant in its thickness, he traced seven miles.

Bog ores are also abundant at many localities in various parts of the State. Though they offer great facilities for the manufacture of iron, these are not improved.

I find some difficulty in ascertaining from the report the exact number of blast furnaces in the State. In different parts of it the following are mentioned:

1 Cherokee Creek,	} South Carolina Manuf. Co.
1 Near Cowpens,	
1 On the Pacolet.*	
1 On People's creek.†	
1 On Kings creek,	} Kings Mountain Company.
1 Below Cherokee Ford,	
4 Cherokee Ford—Cherokee Manufacturing Co.	

10

But the author commences the account of them which I shall quote, by remarking "there are in the State about eight blast furnaces. Two of these belong to the South Carolina manufacturing company, and are situated in Spartanburg district.—They have a furnace on Cherokee creek, and own the mines near the Cowpens. The dimensions of this furnace are as follows:

	Ft. in.
Height.....	28 00
Width at bushes.....	7 06
Hearth.....	1 10

and the charge is:

Ore (brown hematite).....	12,000 pounds.
Charcoal.....	600 bushels.
Limestone.....	1,500 pounds.

The yield is about 5,000 pounds of iron.

The price of charcoal is 2½ cents per bushel; and the cost of raising the ore \$1 50 per ton.

The principal part of this company's works is on the Pacolet, where they have a blast furnace, bloomery and puddling furnaces, rolling mills, and a nail factory in operation. The annual product is about 600 tons.

The King's mountain company have a high furnace on King's creek; but their principal works are on Broad river, a mile or two below Cherokee Ford, where they have a high furnace, bloomery, forges, fineries and a rolling mill. In 1840 the cost of pigs was \$18 per ton made with 290 bushels of charcoal.

The Cherokee manufacturing company's works are situated on the right bank of Broad river, at Cherokee Ford, and consist of four high furnaces, with fineries, puddling furnaces and rolling mills in proportion, together with an extensive nail factory. No expense has been spared in rendering this establishment complete, so far as the works are concerned. The workshops are spacious and well constructed. About 900 tons of iron are the annual product of these works, and the consumption of charcoal 260 bushels per ton. Charcoal is delivered at the furnace at four cents a bushel."

Though some of these statements are altogether unintelligible, they are the only data I have yet obtained for this region. The reader will be left in doubt probably as to the number of furnaces belonging to the S. Carolina manufacturing company; and whether the annual product of their works

* On the map.

† Report, p. 83.

‡ Probably the square of at the bottom.

is 600 tons of pig iron, or refined iron, or nails.—And so of the 900 tons of iron annually produced by the Cherokee manufacturing company. If this be pig iron, there must be a mistake about the four high furnaces, stated in the same paragraph to belong to this company, for this is the yield of only one.

Enough was published, however, to show that the business is conducted with small results and a considerable waste of stock. Still from the cheapness of materials the cost of this pig iron, which is made at all these furnaces with cold blast, and is likely for this reason to be of superior quality, does not probably differ essentially from the estimate given of \$18 per ton.

The annual production for the State, estimated from the foregoing data, may be put, till corrected, at 6,000 tons. H.

The last number of the Cincinnati Price Current has a long article on cotton factories in the west, from which we make the following extracts.

To an English cotton manufacturer, 100,000 spindles in the extended territory bordering the Ohio river, may seem an insignificant matter, yet it will be borne in mind that these are but the germ of the tree.

We pretend not to fix the point of time when the chief seat of the cotton manufacture will be in the valley of the Mississippi; but that it must be there eventually no one can question:

WESTERN MANUFACTURES.

The ruling prices of cotton, for a series of years preceding the present, were exceedingly low, even when compared with other leading staples of the country. As a consequence, the cotton planters, and those who depended on the market for hemp, stock, food, &c., in the plantation States, have become conscious of the necessity of diversifying their pursuits and encouraging home manufactures. Cotton mills have been springing up at various positions in the south and west; and now, at favorable positions, such as Graniteville, S.C., Augusta, Ga., and Cannelton, Ind., systematic efforts are being made to lay the foundations of manufacturing cities. Indeed we are now taking precisely the same steps that England, Belgium, and New England have already taken—the same causes that have built Manchester, Birmingham, Eberfield, Lowell, &c., are now operating in this valley, and with immense power, and it our cities, when surrounded by a sparse population, and only required for the purposes of factorage, grew up with unexampled rapidity, what may we not expect when our clothes, hardware, &c., are made at home. One of our merchants can sell the product of the constant labor of a thousand manufacturers. We shall not lose the merchant, but we shall attract the thousand manufacturers. Our expanding markets, peaceful and serene government, light taxes, abundant food, cheap materials, and genial climate, wonderful facilities of intercommunication, are all combining to make the central section of this valley the chief seat of manufactures in the world.—We now control the commerce of cotton, and our exports of cotton will average, in value, over forty millions of dollars yearly. When we export (as we soon shall) cotton yarns and cloth, instead of raw cotton, the value of these exports will average yearly over 200 millions dollars.

It is, however, argued that the cheap labor and capital of olden countries will enable them to retain their monopoly of the cotton manufacture.

The same arguments were used when England began to receive the weavers of Flanders, when Slater was erecting his cotton frames in R. Island, and lighter taxes and cheaper food in Belgium, Saxony, and Switzerland were attracting cotton machinery from England. We seem to forget that natural forces will always prove more potent than artificial forces; that men and money are more easily moved than iron, cotton and food, and that the former need be moved but once, while the cost of moving the latter is perpetual.

* Report on the Geology of South Carolina, p. 83.

Thus, better markets, cheaper food, and greater security to person and property induced the Flemish weavers to emigrate to England. The abundant iron and coal of Great Britain were natural advantages that enabled her to defy all manufacturing opposition for more than a century, even while engaged in wars over the world, and while increasing her national debt to a sum almost beyond computation. But, when her population passed the practical limit of a home supply of food, and was pressed down with taxes, Belgium, Saxony, and Prussia opened their mines of coal and iron, and as soon as they could copy British machinery, successfully entered the field of competition, and had it not been for recent revolutions, and the insecurity of property on the continent, Havre, Amsterdam, and the Haus towns would now divide with England the imports of our great staple.

The growth of the cotton manufacture in New England was the result of a superabundant population; of higher taxes; of convenient and abundant water power, which, in the infancy of steam power, had a decided advantage, and of greater proximity to the material and our home market. Compare it with our own, these advantages do not now exist in New England. The power of steam is now, where coal can be had at 10 cents the bushel, cheaper than that of water. The steam engine now does far more work and with a much less expenditure of fuel, than it did ten or twenty years ago. There is now a large deficiency of food in New England, and her sterile land has now reached such prices that labor must be driven from it, if it can find as eligible and cheaper positions of employment elsewhere.

We have every element that enters cotton cloth, and at average prices far cheaper than elsewhere. Our iron ores for machinery, and coals for power, are equal in quality and greater in quantity than those of England or of Belgium, and at one-fifth their cost in labor. Cotton is within two day's journey—subsistence is found in the utmost profusion around us. Our great natural and ever open highways afford us the cheapest possible facilities of intercommunication. Our climate is most favorable to life and to labor. Our taxes are lighter, by far, than those of any other people. We have, and our position will always secure to us, the greatest possible security to persons and property. We have now a population superabundant for the supply of our agricultural wants; and now, when we are fully prepared to develop our mineral manufacturing resources, and to enlarge those branches of industry that have been regarded as the chief sources of wealth and the evidences of high civilization, the newly discovered mines of gold on the shores of the Pacific, are not only providing us with the means of manufacturing action, but are opening nearer channels of communication between ourselves and people of other countries, climates and products, and with whom we should naturally make exchanges.

In Cincinnati, Covington and Newport, there are five factories, viz: Franklin Mill, of Harkness, Fosdick & Strader; Pearce, Gould & Co.; J. C. Giesendorf; Covington Cotton Factory, and Newport Cotton Factory.

The Franklin Factory has 10,000 spindles; 220 looms; manufactures 42,000 yards of brown sheeting weekly; consumes 1800 bales of cotton per year, and employs daily 250 hands; steam power.

Gould, Pearce & co., 2500 spindles and 32 looms; produces 300,000 yards of sheeting per annum, and 150,000 pounds cotton yarn; consumes 600 to 700 bales of cotton yearly, and employs daily 60 hands; steam and water power.

O'Shaughnessy & Co., 3000 spindles; manufactures 13,500 yards 4-4 brown sheeting and 2000 lbs. cotton yarn per week; consumes 900 bales of cotton per year; employs daily 75 hands; steam power.

Covington Cotton Factory, R. Buchanan, agent; 2600 spindles; makes yarns only; consumes 950 bales of cotton per annum; employs about 90 hands; steam power.

J. C. Giesendorf, 1000 spindles; produces 5000 lbs. yarn, wick and batting, per week; consumes 500 bales of cotton yearly, and employs 30 hands; water and steam power.

The above spindles are all in operation, and in addition to these Messrs. O'Shaughnessy & co. in-

tend to increase their number from 3000 to 6000; and Mr. Giesendorf, who has just removed his machinery into a new building, purposes adding to the number of spindles from time to time, until it is increased to 6 a 7000.

The Cooper Cotton Factory, Dayton, 2300 spindles; produces yarns; consumes 900 bales of cotton annually, and employs about 80 hands; water power.

Castalia Manufacturing Company, Castalia, Ohio; 1700 spindles, 48 looms; 1200 to 1400 yards heavy brown sheetings made per day; consumes 312 bales of cotton annually; employs 35 to 40 hands.

Springfield Cotton Mill, Springfield, O.; 500 spindles; produces 90,000 lbs. yarns, carpet-warp, and batting, and consumes 900 bales of cotton annually; employs about 20 hands.

Maysville, Ky., Cotton Mill, A. M. January & Co.; runs 3700 spindles; produces cotton yarns only; consumes 1000 to 1200 bales cotton per annum; employs 85 to 100 hands; steam power.

Brookville, Ia., J. Woods; runs 1200 spindles; produces 600 lbs yarn per week; employs 30 hands; water power.

Steubenville, Ohio, G. E. & J. W. Warner, runs 4700 spindles; produces 900 yards of brown sheetings and 15,000 lbs. yarns per week; employs 180 to 200 hands.

Zanesville Cotton Mill, Zanesville, Ohio; 1744 spindles; produces 232,500 lbs. yarns, warp and batting per annum; consumes 250,000 lbs. cotton; steam power.

Miamisburgh, Ohio; M. Cassady & Co.; runs 500 spindles; produces 2150 lbs. yarns, batting, etc. per week, and consumes 200 bales of cotton per year; employs 90 hands; water power.

Wellsville, O.; runs 2000 spindles; produces yarns; consumes 750 bales of cotton per year.

Pittsburgh Eagle Factory; 6000 spindles; produces yarns only; consumes 1000 bales of cotton per annum.

Allegheny Factory; 1500 spindles; produces yarns; and consumes 600 bales of cotton per annum.

Penn Mills; 6300 spindles; produces sheetings; consumes 1700 bales of cotton per annum.

Pitt Mills; 5000 spindles; produces sheetings; consumes 1500 bales of cotton per annum.

Star Mills; 4000 spindles; produces sheetings; consumes 1200 bales of cotton per annum.

Wheeling Manufacturing Company; 2000 spindles; produces sheetings; consumes 700 bales of cotton per annum.

Brighton, Pa.; 1000 spindles; produces sheetings, and consumes 400 bales of cotton per year.

Cannelton, Ia.; (now receiving the machinery, and will be in operation about the first of May,) capacity 10,800 spindles; estimated production, 5,000,000 yards of No. 14 brown sheetings per annum.

There are in addition to the above, Mills at Bon Harbor, Lexington, and Paris, Ky., Columbus and Dayton, Ohio, from which we have no statement, but from what we have been able to learn, their combined capacity is about 12,000 spindles.

It is seen by the above that we have in operation in this western valley, *eighty-nine thousand* spindles; and the additions to be made to factories in this city and vicinity, will, in another year, swell the number to near *one hundred thousand*!

Railway Progress.

Continued from page 263.

On scarcely any line of railway are these mechanical conditions to be found. The rails are upbraided and crushed out on their surfaces: they are hammered into notches in their chairs, and are loose therein; and their abutting joints are not of one-fourth the strength to resist deflection that exists in their intermediate portions. The clinking, sound so familiar to the ear of every traveller, like the loose shoe of a horse, is caused by the springing of the rails in the joint-chairs at every fifteen feet distance, and not only destruction thence arises, but retardation of the train. The momentum is momentarily absorbed by concussion, and fresh steam must be generated to replace it: it is equivalent to starting the train afresh.

It is evident, therefore, that the weight of the rolling stock is in excess of the railway strength. Mr.

Stephenson warned the legislature of this three years back. "If you persist in the use of heavy engines, you must reconstruct your railways." The engine tyres are many times the strength of the rails they run on.

There are two mechanical modes of meeting the difficulty. One is, to increase the strength and weight of the rails of the railway; the other, to diminish the weight of the rolling stock.

Against the former—increasing the weight of the rails, Mr. Brunel, who should be skilful in questions of weight, has lifted up his voice in the Institute of Civil Engineers, proclaiming that, in his practice, rails of 60 lbs. to the yard are more durable than those of 85. He says, that no good iron can be obtained in large sizes. Very possible, though that difficulty will not long endure under increasing competition, skill, and industry. The more probable solution is, that the light rail is elastic, and gives and takes better with the longitudinal sleeper to which it is fastened. And it is quite clear that the elastic yielding will have a tendency to elude abrasion. But this will be at the cost of wasted steam-power, precisely as a horse, in galloping over loose sand, will save the waste and wear of his shoes at a much greater expenditure of wind.

The present rails of the heaviest make are 92 lbs. to the yard, and practical instances exist of their being actually trodden out in nine months by existing traffic. Therefore, to get a durable rail, the weight would require to be at least doubled; and the surface artificially hardened with steel, to resist abrasion. There is yet more than this. The contact of the wheel with the rail is a point, or at most, a line across the rail. The width of the present rails is two inches and a half. To get sufficient surface to prevent crushing, would require probably five inches breadth; and, to produce this, would require iron of at least 300 lbs. per yard.

To support such rails proportionably, would require a range of cross sleepers in close contact with each other, similar to the "corduroy" roads of America.

This would be costly in capital, but supposing the traffic in proportion, warranting the incessant use of monster engines—a stream of passengers and goods not otherwise to be carried—it might be an advisable investment. The use of the monster engines *without* the giant's road, can clearly only be ruinous.

But if, on examination, it appears, that the amount of traffic could be carried over the same rails by merely duplicating or tripling the number of the trains, and thus reducing the weight, it would be commercially the best arrangement. And supposing the traffic still to increase, it would be better to duplicate the number of the rails than to duplicate their strength.

In dealing with vessels in water, increase of size is of little disadvantage compared with the advantage, because increase of size gives increase of surface-bearing. But the tread of a wheel on a rail can be very limitedly increased, and only by the breadth of the rail. Practically, the bearing surface is commonly a point.

To determine the weight that may be advantageously placed on a single wheel, we must revert to the powers of iron to resist crushing. From mechanical experiments, it appears that good wrought iron begins to crush under a steady weight of eleven tons to the square inch. Now, the driving wheels of many locomotive engines have ten to eleven tons on a surface of two points, it is evident, therefore, that destructive wear must ensue. Engines of eleven tons weight on two point at forty miles per hour, over unsteady rails, may very well warrant the appellation of *anti-dividenders*. If, therefore, the weight on a pair of driving wheels can be reduced to five tons, the resisting power upon the rails may be in excess of the crushing power of the load, and the way be rendered really "permanent," i. e., permanent in durability and not in expense in maintenance. It is obvious that this is mechanically the most economical arrangement, if the mechanical power be competent to the commercial demand. Upon examination, we shall find that, in ordinary traffic, a large portion of the engine power is at present absorbed in carrying dead weight. An engine, a tender, a break-van, one first-class and three second-class carriages, make

up a gross weight of 55 tons on 30 wheels, and afford accommodation for 18 first-class and 96 second-class passengers—total 114.

Net weight of passengers, say.....tons 9
Ditto train..... 55
or more than six tons dead weight to one ton of paying load.

But on the Eastern Counties and the Cork and Brandon lines it has been shown, that with a differently constructed engine and carriage, weighing only 21 tons, on sixteen wheels, 30 first-class, and 96 second-class—total 116, may be conveyed at the same speed, and with a consumption of only one-third as much coke. In this case, the proportion will be

Net weight of passengers, say.....tons 9
Ditto train..... 21
or little more than two tons dead weight to one ton of paying load. The advantages, therefore, in favor of the light system, are—

In non paying weight, as.....	21	to	55
In passengers.....	116	"	114
In wheels.....	16	"	30
In coke.....	1	"	3
In oil and grease.....	1	"	3
In outlay of capital.....	1	"	2
Interest on ditto.....	1	"	2
Repairs.....	1	"	2
Depreciation.....	1	"	2
Maintenance in way.....	0	"	0

The true plan is to provide for the maximum average, and let the occasional surplus wait till the next time, as was the case with the stage-coaches. A maximum average of 100 might on an occasion reach 1000, but it would be absurd to provide a train for them.

In making future railways—which will again be ripe as soon as the final extent of wasted capital in the existing lines is understood—the light system must come largely into operation. The saving of cost in construction of bridges and works for light weights will be very great; and if landholders come to their senses, as they will be fain to do, the probability is that railways will be made, with rolling stock complete for passengers, at about £7,000 per mile of double way. The existing railways must look to it, and set their houses in order. They must write off their wasted capital, and make the most of their goodwill, being the first in the field. There is no improbability in the assumption that Telford's Menai Bridge will yet serve for the transit of light railway trains, in the coming time, when Ireland shall be an integral part of England, and the Hollyhead sea-ferry be worked by the longest iron steam-ships the world can boast, setting fire, wreck, and sea-sickness alike at defiance—practically a moving steam-bridge, as simple as the present passage of the Mersey from Liverpool to Berkenhead, and scarcely more costly to the passengers.

To be continued.

Meteorological

We find in the Boston Traveller an elaborate meteorological table of observations extending thro' a long series of years, from which we make the following selections.

The mean temperature of each month in 1849, in Boston, (lat. 42° 21') at the observatories at Amherst and Cambridge, Mass., and at that at Greenwich, were as follows: Amherst and Cambridge being situated about 75 and 4 miles westerly from us, in latitudes exceeding our own by 1 and 2 minutes only; but that of Greenwich (51° 29') is more than nine degrees greater:

	Jan.	Feb.	Mar.	Apr.	May.	June.	July.
Boston....	24.62	22.89	38.22	45.39	53.65	67.57	71.10
Amherst....	20.02	18.50	35.37	43.49	53.42	66.88	72.09
Cambridge....	21.05	18.20	35.80	43.50	53.00	67.60	71.60
Greenwich....	40.13	42.5	43.2	54.0	57.9	62.1	

	Aug.	Sept.	Oct.	Nov.	Dec.	Year.
Boston....	69.32	62.17	51.27	47.60	31.67	48.93
Amherst....	68.85	60.05	47.03	44.08	28.40	46.65
Cambridge....	69.20	60.00	49.20	45.00	28.90	47.04
Greenwich....	62.9	58.8	51.1	44.1	39.1	49.92

The quantity of rain, including melted snow, was as follows, in inches:

	Jan.	Feb.	Mar.	Apr.	May.	June.	July.
Amherst....	0.99	0.99	4.21	2.24	3.61	1.53	2.25
Cambridge....	0.72	1.46	6.90	1.24	2.76	1.37	1.17
Greenwich....	1.59	2.20	0.45	2.20	3.90	0.20	2.90

	Aug.	Sept.	Oct.	Nov.	Dec.	Year.
Amherst....	7.86	1.40	6.36	3.65	3.36	48.45
Cambridge....	6.52	2.13	7.56	5.43	3.78	41.04
Greenwich....	0.45	3.30	2.72	1.55	2.40	23.84

The mean temperature of each month during the last nine years, at Boston, Cambridge and Greenwich, was as follows:

	Jan.	Feb.	Mar.	Apr.	May.	June.	July.
Boston....	29.05	27.11	36.16	46.56	56.29	66.78	71.67
Cambridge....	25.57	23.63	33.70	44.91	54.79	65.50	71.07
Greenwich....	37.48	38.43	42.37	46.72	54.35	59.63	61.51

	Aug.	Sept.	Oct.	Nov.	Dec.	Year.
Boston....	70.03	62.98	51.05	41.95	31.88	49.43
Cambridge....	69.10	61.28	48.35	39.18	29.47	47.32
Greenwich....	61.08	57.06	49.78	44.43	40.32	49.43

The average quantity of rain in each month, at Cambridge, during the last six years, and at Greenwich during the last nine, was as follows:

	Jan.	Feb.	Mar.	Apr.	May.	June.	July.
Cambridge....	2.89	2.72	4.02	1.65	3.43	2.88	2.74
Greenwich....	1.81	1.74	1.50	1.63	1.98	1.60	2.31

	Aug.	Sept.	Oct.	Nov.	Dec.	Year.
Cambridge....	3.91	3.82	4.07	4.34	4.60	41.96
Greenwich....	2.62	2.32	3.38	2.53	1.56	25.03

At Cambridge the greatest quantity falls in December; the least in April.

At Greenwich the greatest quantity falls in October; the least in March.

Greatest quantity in any month at Cambridge, in 6 years, Nov. 1846, 10.43 inches.

Least quantity in any month at Cambridge, in 6 years, Jan. 1849, 0.72 inches.

Greatest quantity in any month at Greenwich, in 9 years, Oct. 1841, 6.0 inches.

Least quantity in any month at Greenwich, in 9 years, June 1849, 0.2 inches.

The mean temperature of each of the last nine years was as follows, viz:

	1841.	1842.	1843.	1844.	1845.
Boston....	48.81	49.65	48.33	49.00	50.06
Cambridge....	46.53	46.79	45.30	46.04	49.06
Greenwich....	48.64	49.59	49.38	48.63	47.58
	1346.	1847.	1848.	1849.	Mean.
Boston....	50.28	49.98	49.70	48.93	49.43
Cambridge....	49.06	47.76	47.92	47.04	47.32
Greenwich....	51.96	49.63	50.23	49.92	49.43

In the course of the nine years the thermometer was—

Boston.	
Highest....	June 30, 1841....97
Lowest....	Jan. 30, 1844....-2

Cambridge.	
Highest....	July 12, 1845....100
Lowest....	Jan. 5, 1841.... 15

Greenwich.	
Highest....	July, 1846....92
Lowest....	Jan., 1841.... 4

Range.....	
115	

Range.....	
84	

The following table contains the mean temperature in Boston the last twenty-five years:

1825.....	51.33	1837.....	46.63
1826.....	50.30	1838.....	48.51
1827.....	45.75	1839.....	49.46
1828.....	51.79	1840.....	49.49
1829.....	48.43	1841.....	48.81
1830.....	50.08	1842.....	49.65
1831.....	49.17	1843.....	48.33
1832.....	48.28	1844.....	49.00
1833.....	48.41	1845.....	50.06
1834.....	48.23	1846.....	50.28
1835.....	47.52	1847.....	49.98
1836.....	45.85	1848.....	49.70
1849.....	48.93		

	Jan.	Feb.	Mar.	Apr.	May.	June.	July.
Warmest....	34.51	37.60	41.64	50.73	63.19	70.50	76.43
Coldest....	19.87	19.84	29.05	41.38	53.03	60.12	67.81

Difference	14.64	17.76	12.59	9.35	10.16	10.38	8.62
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	Aug.	Sept.	Oct.	Nov.	Dec.	Year.
Warmest....	72.84	68.14	54.41	47.69	38.31	51.79
Coldest....	65.56	58.48	46.40	35.37	18.09	45.85

	Jan.	Feb.	Mar.	Apr.	May.	June.	July.
First 13 yrs....	26.82	27.94	36.15	46.30	56.86	65.68	71.20
Last 12 yrs....	28.61	27.38	36.35	46.67	56.40	66.74	72.12

	Jan.	Feb.	Mar.	Aprl.	May.	June.
First 13 vs	26:83	27:94	36:15	46:30	56:86	65:68

	Ther. high-est	Ther. low-est
.....	62	64

	Ther. high-est	Ther. low-est
.....	62	64

	Ther. high-est	Ther. low-est
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	Ther. high-est	Ther. low-est
.....	62	64

	Ther. high-est	Ther. low-est
.....	62	64

The whole range of rail covered by each line of 60 wheels will be 165 feet. The body of the car would thus be long enough for a ship of 190 feet keel which is quite sufficient for the proposed amount of tonnage.

The flange wheels being only the six pairs on the front and back, the car will be able with ease to turn sharp curves on plate rails and to enter turn-outs if required. The body of the car on which the ship will rest during transit will be composed of two main side walls on longitudinal string pieces of timber or wrought iron capping the two lines of wheels. Along the top surface of these two side walls, for the space of 50 or 60 feet on the central section of their length, will be permanently fixed two spring cushions or elastic beds, having a deep range of elastic action, so as to be capable of forming spontaneous adjustment to the varying forms of the floor timbers of ships near the midship sections. The remaining portion of the tops of the side walls of the car, before and behind the above-named stationary cushion, will be divided, each length of 50 or 60 feet, into 3 or more sections. Each of the sections will have an independent cushion or spring bed, like the main midship cushions in composition and elastic range, but differing from them in being attached to a frame capable of rising or falling to or from the bottom of the ship as its particular from opposite that spring may require. These several spring frames will receive their motion and adjustment from sliding screws, operated on by nuts and turning rods. The elasticity of the cushions can be entirely destroyed in a moment, and may remain out of action while the screwing up or adjustment of the spring bed to the peculiar form of each ship takes place. The power of one man will thus be made sufficient for the process of fitting the ship to the truck. The elastic force of all the cushions can then be instantly restored and made to press with any desired strength on the bottom of the ship. The nuts of the adjusting screws will have to be worked while 10 or 15 feet under water, a guide cord on the nut and perforated turning rod, is therefore used to prevent delay. In the middle of the cross section of the car on the extreme front and back ends there will be fixed two expanding jaws or forks made to embrace the dead wood and gripe of the ship. By the guiding action of these forks when the ship begins to settle down over the car, the keel will spontaneously settle on the middle line between the side walls of the car, thus ensuring by a self-acting process perpendicularity and equalization of weight on each side, without any assistance from the dock-keepers or ship's crew.

It is now to be observed that the ship railway will terminate at each shore in the bottom of the entrance dock. This dock may be either a full lift dock with gates at each end, and the rails altogether on the level, or the lift of the dock may be limited to 5 or 6 feet, and the remaining rise to the leading level of the railway be attained by incline.—The decision of this point would be a question of cost resting on definite survey of the locality. One plan has no material advantage over the other in point of accommodation.

As soon as the ship car has entered the dock, the inland gates are closed, the dock flooded and the sea gates opened, and the ship intending to take passage is then floated over the car. A portion of the water is then gradually let out of the dock, until the sinking of the water on the ship's sides shows that she has settled on the two main cushions of the car. As soon as a small pressure of 150 to 200 tons is found by the abatement on the ship's sides to take effect on the two main cushions, the further escape of the dock water is then suspended, until all the fore and aft adjusting cushions have been screwed home on both sides and all their elasticity restored. All the remaining water is then let out of the dock, the inland gates are opened, and the locomotive power is then to be attached to the car, when the ship proceeds along the line in the same way as any other train would do, except that during a fair wind no locomotive is required, as the wind would produce greater speed on all ordinary grades of railway than it could produce on the same ship in water.

This novel plan is sustained by a long argument in which the various objections that naturally suggest themselves are met; and we think successful-

ly disposed of. We have only room for such portions of the article as give a general idea of the mode by which the ship is to be received on the car and taken across the isthmus.

This plan may strike people on the outset as of impossible execution; but we think that their objections are due rather to its novelty than to any real difficulty in the way. A road of sufficient strength can easily be built. So can a car of sufficient strength and dimensions be constructed. The ship can be easily mounted on this car, and can be so supported as not to be subjected to injurious strains. What objection is there then but the magnitude of the work. It does not appear half so difficult of accomplishment as have many schemes in the outset, but which have been successfully realized. Could a loaded ship be safely transported across the isthmus, a new face would be put upon the commercial affairs of the world.

Tennessee.

East Tennessee, April 17, 1850.

Editor Railroad Journal—

Dear Sir—Enclosed I send you the following statement of the condition and prospects of the East Tennessee and Georgia railroad, which, if you deem of sufficient importance please insert in the Railroad Journal.

EAST TENNESSEE AND GEORGIA RAILROAD.

The contract for the construction and equipment of this road, from its junction with the Western and Atlantic railroad at Dalton, Geo., to Knoxville, Tenn., recently held by Gen. Duff Green, has, by an arrangement mutually satisfactory to him and to the board of directors, been rescinded. To Gen. Green's energy and public spirit is mainly attributable the revival of this most important work, after a ten years' state of inactivity; and it is gratifying to learn that he has realized a very handsome profit by the operation. He retires from this contract to engage in other enterprises equally important, and it is to be hoped in their result they may prove equally profitable to him.

The company have assumed the subcontracts made by Gen. Green, and are rapidly progressing with the grading and the delivery of timber as far as Charleston on the Hiwassee river, a distance of 40 miles from the southern terminus at Dalton, and this portion of the road will be in readiness for the track as soon as the 1st of July.

By an act passed at the last session of the Legislature of Tennessee, the State has offered a loan to the company of \$350,000, to be expended exclusively in the purchase of rails and equipment for the road. Dr. J. G. M. Ramsay of Knoxville, has been appointed agent on the part of the State, and Hon. A. P. Keys, of Athens, the President, on the part of the company, to make the purchase in compliance with the terms of the act. The board have adopted the T rail, to weigh not less than 100 tons to the mile, equal to nearly 64 pounds per yard. Mr. M. B. Prichard, of Massachusetts, an engineer of much experience, has been unanimously confirmed by the directors as the Chief Engineer of the road.

The company, being relieved from the embarrassment caused by Gen. Green's contract, and also able to avail themselves of the proffered aid of the State, can now offer their stock with as good a showing of prospective profits as can be presented by any road in the United States.

The present company are successors to the Hiwassee railroad company, which commenced operations on the road in 1838, under the expectation and assurance that Georgia would continue her line of railroads to the State line; but the Georgia

enterprise having failed, this road also stopped, but not until some \$900,000 had been expended upon the grading, the State of Tennessee and individuals each holding one half of the stock. As the work was done at high prices, and in order to induce further subscriptions to complete the road, the Georgia road by this time having reached Dalton, a point but 15 miles from the State line, in 1848, the East Tennessee and Georgia railroad company was formed, and all the old stock was exchanged for new, at the rate of a share of old for one of new.—The following statement shows the present position of the company:—

Stock held by the State of Tennessee in lieu of \$450,000 Hiwassee stock.....	\$225,000
Stock held by individuals in lieu of \$450,000 Hiwassee stock.....	225,000
Stock recently issued to the state in lieu of 5 per cent bonds.....	70,000
Stock recently issued to individuals.....	70,000
Total stock now out.....	\$590,000
Add to this debt of company say.....	40,000

Total cost of road thus far.....\$630,000

For this sum the company have upwards of 80 miles of road graded in a very superior manner, and most of it for a double track, and a very superior bridge of 3 spans across the Hiwassee river, so arranged as to be used as a toll bridge as well as for the railroad; and also, the timber for the superstructure delivered on upwards of 20 miles. The completion and equipment of the road to Knoxville at the Engineer's estimate is \$1,150,000.

Of this sum the company have an unpaid subscription from the state of \$129,000, payable in five per cent. bonds, worth a 85, say.....	\$110,000
Individual subscription say.....	20,000
State loan \$350,000, 6 per cent Coupon bonds worth a 1.04.....	364,000
	\$494,000

Leaving to be subscribed for but....\$656,000

And making the whole cost of the road 110 miles.....\$1,780,000

which is equal to but \$16,000 per mile for a first class road with a heavy T rail, and fully equipped. As to the magnitude of the prospective business of the road, no one who has ever travelled through the beautiful valley of Western Virginia and East Tennessee, can doubt. This valley runs in a northeasterly direction parallel with the coast and the Blue Ridge, and lies between the Blue Ridge and main Alleghany chain, and is about 130 miles in width. The surface is gently undulating and the soil exceedingly productive; but on account of its being completely shut out from a market, by reason of the chains of mountains between it on the one side, and the Mississippi valley on the other, the farmers have not been able to accumulate much wealth, nor is there much money in the country.—The principal articles of export have been horses, mules, cattle and hogs, immense droves of which are annually taken many hundred miles at great expense to Eastern Virginia, and to Georgia and South Carolina. It is far within the truth to assume that the average width of the rich wheat or corn lands (fully equal for wheat to the lands of Western New York) is 20 miles, and that with the road to Knoxville at least 150 miles in length, will be directly tributary to it, this will give 2,000,000 acres, which, if all cultivated in corn, and counting but 30 bushels to the acre, will yield 60,000,000 bushel, say but half of this should be transported on the railroad, leaving the rest to be converted in-

to beef, pork, horses, mules, etc., all of which are in their turn to take the road, we shall then have 6,000,000, which, at say 7 cts. will give \$420,000 to the road; and as the cost of transportation to the seaboard, (Charleston, S. C., or Savannah) will be less than from any other cheap grain-growing portion of the United States, the distance by railroad being under 500 miles, there can be no doubt that even a much larger amount of grain will be annually taken over the road, to say nothing of the almost innumerable other articles of freight for the southern market, the travel and transaction of this business will produce, and perhaps the equally large amount of up freight, necessary to supply the wants of at least 500,000 inhabitants, must make this road one of the best stock paying roads in the country. In addition to the products of the soil, the mountains and spurs are filled with iron ore of the best description, also bituminous coal and copper and lead ores in great abundance, many of which are now being extensively worked. The iron on account of its superior quality commands in the Pittsburgh market the highest price, and large quantities are annually sent round by the Tennessee and Ohio rivers, a distance of over 2500 miles. Running through the valley are numerous large streams, which will furnish water power sufficient to manufacture flour, cotton, iron etc.—The mountains are covered with a very fine growth of every variety of timber. Charcoal is manufactured and sent to the foundries for three cents per bushel.

Business sufficient to pay a large dividend may be safely calculated on as soon as the road reaches the Hiwassee river, 40 miles from Dalton, for then it must command the whole trade, by means of the small steamboats that now navigate the Tennessee river, for by running up the Hiwassee 15 miles the navigation being equally good, they will be as near Dalton as if they had passed down the Tennessee to Chattanooga, the point at which the Western and Atlantic railroad strikes the river; but as the bridge is built and the road graded 40 miles beyond the Hiwassee to the Tennessee it is not expected that the road will stop for any length of time at that point; it is therefore apparent that the construction of the road is warranted by the business of the country through which it passes. But it is not to stop at Knoxville; it is a most important link in the great southwestern chain of railroads from New York, or rather Portland, Maine, to New Orleans. The northern connections are now being rapidly built through Virginia, and the East Tennessee and Virginia company are now making vigorous preparations for the commencement of work on this road. The southern connections are also in a state of progress, and it is probable that in less than five years, this valley, hitherto so little known, will be one of the greatest thoroughfares in the United States, the distance between New York and New Orleans being shorter by several hundred miles than by any other route upon which a railroad can be built. As the country is rich in everything but money, the company will have to depend to a certain extent upon legislative and foreign aid and an effort will be made to induce capitalists in the cities to subscribe to the stock.

Britannia Bridge.

The English papers are filled with accounts of the opening of this magnificent structure. The following are some of the experiments made to test the strength of the bridge.

The second experimental convoy that went through consisted of 24 heavily laden wagons filled with

huge blocks of Brymbo coal, in all, engines included, an aggregate weight of 300 tons. This was drawn deliberately through, at the rate of from 8 to 10 miles an hour, the steam working at quarter power. A breathless silence pervaded until the train came out with colors flying, on the other side of the tube, when loud acclamations arose, followed at intervals by the rattling of artillery down the straits. Upon the return, which occupied about 7 minutes, similar demonstrations ensued, and during the progress of the train, those who were appointed to ascertain any possible vibrations, reported they could detect no sensible deflection.

An ordeal stronger still was then resorted to; a train of 200 tons of coal was allowed to rest with all its weight, for two hours, in the centre of the Carnarvonshire tube, and at the end of the time, on the load being removed, it was found to have caused a deflection of only four-tenths of an inch. It is calculated that the whole bridge might with safety and without injury to itself be deflected to the extent of 13 inches. These loads, it is most material to remember, are immensely more than the bridge will ever be called upon to bear in the ordinary run of traffic, though the engineers are of opinion that it would support with ease, and without much show of deflection, a dead weight on its centre of 1000 tons.

Virginia.

The following is a statement of the amount of liability incurred by Virginia in aid of works of internal improvements, at the last session of its Legislature, and the nature of work so aided:

	Joint stock principle.	Amount of State state sub-acc't. description.	Guaranteed bonds.
Completion of James river and Kanawha Co. canal from Lynchburg to Buchanan.....		\$110,000	
James river and Kanawha company extension from Buchanan to Covington.....			360,000
Richmond and Danville railroad.....			200,000
Southside road (bonds of Petersburg).....			323,500
Louisa railroad from Richmond to Junction Louisa railroad to Covington.....			100,000
North river Navigation company.....			420,000
Hazel river Navigation company.....			60,000
Turnpikes, plank roads etc.....			45,000
	134,900	577,425	
	244,900	1,102,425	983,500
			983,500
			\$2,330,825

Maryland.

Baltimore and Ohio Railroad.—We are informed that the recent call for proposals for an additional section of the Baltimore and Ohio Railroad embraces the remainder of the entire line to the western terminus, excepting only the part which awaits the issue of whatever action may grow out of the controversy with Wheeling respecting the routes by Grave Creek and Fish Creek. This question must be decided, at latest, by the first of October next, under the provisions of the act of Virginia just passed with a view to its speedy determination. Whatever may be the decision, we are assured that the work cannot be greatly delayed thereby, and that if the line heretofore adopted by the Company be sustained, the whole road will be opened in the summer of 1853. Upon the most difficult parts of the route, occurring in the crossing of the mountains, and which were placed under contract last year, the work has advanced well through the winter, notwithstanding its severity in that region, and during the ensuing season it will be urged forward with increased rapidity. The iron for the

whole line has been contracted for upon highly favorable terms, and the first ship load is daily expected. The delivery of the other materials for the track has already commenced. Steps are being taken to provide all the necessary machinery for the new road, and, in short every department of the work exhibits commendable activity. The emulation excited among other enterprises is the best evidences of this. We see Philadelphia hurrying forward to reach Pittsburg, and New York to reach Dunkirk, if they can, before we get to Wheeling; and we see Ohio and the States north and west of her, and indeed the whole Mississippi valley, stimulated to the highest enthusiasm in the railway race by that which is now running between the Atlantic cities. The interest of the contest must increase as it draws to a close, and we are therefore prepared to see Baltimore manifesting that increasing interest in the earnest and effectual manner which becomes an occasion so momentous to her prosperity.—*Balt. Amer.*

Immense Coal Field.

The Somerset Post contains the following notice of the immense coal beds of Perry county, Ohio:

"Near Straitville, in Salt-lick township, in this county, there is a bed of coal which is probably the largest in the world, which has been computed by competent judges, to be about 128 feet in thickness. We have visited it several times, and we know from observation that it exceeds even the most extravagant idea we could have formed of a coal bank, without travelling out of all reason—The coal strata exhibits a bold front of about 27 feet from the abrupt portion of the hill."

"The idea is prevalent in some places where the fame of this bank has spread, that the strata of coal have, by some convulsions of nature, been thrust into a perpendicular direction. This, however, is not the case. The strata remain in a horizontal position, and there is no more evidence of a freak in nature about this bed than is usually found about coal beds."

Canada.

Population of Montreal.—The following is a comparative statement of the inhabitants of the city of Montreal, in the years 1844 and 1850:

	1844.	1850.
Natives of England.....	3,161	2,666
" Ireland.....	9,595	10,007
" Scotland.....	2,712	2,383
" Canada—French.....	19,041	21,300
" " British.....	8,863	10,465
" Other places.....	212	749
" United States.....	701	637
Total.....	44,285	48,207

Population of Quebec.—The recent census gives 37,365 as the number of inhabitants of Quebec.

	1844.	1850.
Natives of England.....		1,148
" Ireland.....		6,182
" Scotland.....		630
French Canadians.....		22,375
British Canadians.....		6,776
Natives of Germany.....		48
" United States.....		56
" Other countries.....		149
Total.....		37,365

Population in 1844..... 35,673

Increase..... 1,692

Toronto and Lake Huron Railroad.—The Toronto correspondent of the Montreal Courier writes as follows:

"The prospects of the Toronto and Lake Huron railroad are much brighter than at any previous period. Messrs. Wood & Co., contractors for the Montreal and Portland railroad, have proposed to build the road at \$25,000 per mile, including cars, engines, station houses, and all the necessary 'fixings.' They offer to give security to have the road completed by the first January, 1852, provided the city of Toronto and the County Municipal Council take £150,000 in stock, and £350,000 in tickets be secured in payment. Messrs. Benedict & Co. have also made some proposal; and a joint proposal has been made by these two companies. The

city corporation have had the matter under consideration, and a select committee has been appointed to take it into full consideration. There is a probability that the Simcoe Municipal Council will subscribe its share of the stock."

We have frequently spoken of this projected work, and the excellence of the line for a railroad enterprise. The plan of having corporations subscribe stock in railroads, in which they are interested, is getting to be of almost universal practice in the United States; and it is at once the most effectual and equitable mode of raising the money—as the security thus given is perfect, and all are called upon to bear the burden in proportion as they are benefitted. We hope this project will succeed.

Tennessee.

The City of Memphis, by a popular vote of 706 to 194 against, have decided to subscribe \$500,000 to the Memphis and Charleston Railroad, which contemplates the connection of Memphis with the Nashville and Chattanooga Road. The Memphis Eagle notices the vote and remarks:

"We congratulate our friends here and elsewhere, upon this cheering evidence of the warm interest in behalf of the Memphis and Charleston Railroad, felt by the citizens of Memphis. Our friends in Alabama, Mississippi, and Tennessee, must now join us in pushing the good work forward. The right spirit is abroad, and it should be encouraged, strengthened, increased, by vigorous and unceasing labors. How soon shall the cars be upon the track, friends? If you come up to the work with manly will, in four or five years freighted cars, in the iron grip of the steam car, will pass and re-pass between Memphis and Charleston."

Indiana.

Lawrenceville and Upper Mississippi Railroad.

This road was first chartered in 1848, and was designed to connect Lawrenceburgh and Rushville, a distance of 50 miles. Under the first charter but little was accomplished. Subsequently, at the session of the Legislature of 1848-9 the company was authorized to extend their road west from Greensburgh by way of Melford, Edinburgh and Martinsville, to the west line of the State, and renewed and successful efforts were made to obtain subscription to its stock. The city of Lawrenceburgh subscribed \$40,000, and the county of Decatur \$100,000. Further subscriptions to the stock were made by individuals, and on the 13th August last the first division, embracing 17½ miles from Lawrenceburgh to the head of Tanners' creek, was put under contract.

At the last session of the Legislature this company was authorized to construct a branch from Millford to Columbus, on the Madison road, and another branch from Greensburgh to Shelbyville; and from thence, in conjunction with the Shelbyville and Rushville company, to extend it to Indianapolis. By this last act the name of the road was changed from the "Rushville and Lawrenceburgh" to the "Lawrenceburgh and Upper Mississippi railroad." The company propose in the first place to build the railroad from Lawrenceburgh to the Madison and Indianapolis at Edinburgh, a distance of about 68½ miles. The ultimate destination of the main line is Terre Haute by way of Martinsville for the purpose of uniting with the projected road from that point to the Mississippi river. The friends of this road claim that the connection would constitute it the main trunk line of a railroad from Cincinnati to the Mississippi, in preference to a route through the southern part of Indiana.

The following is a statement of the resources now at the command of the company:

Stock subscribed in cash	\$85,000
" " real estate	46,000
" " by contractors	12,000
" " by the city of Lawrenceburgh	40,000
" " by the county of Decatur	100,000
	\$283,000

This work is still in its infancy, and a large amount of additional subscriptions are confidently counted upon.

To complete the first division of 17½ miles will require the following sums viz:

Amount to be expended to complete grading	\$56,000
Superstructure and laying track	27,000
Iron	90,000
Depots, furniture, etc.	20,000
Other expenses	10,000
	\$203,000

The means applicable to this division are as follows:—

Individual subscriptions	\$65,000
Real estate to be sold	30,000
City of Lawrenceburgh bonds	24,000
County of Decatur	30,000
Timber for superstructure to be paid for in stock	14,400
	\$163,400

Leaving a balance to be provided of 39,000 which, it is believed, can be readily made up by further subscriptions. The balance of the city of Lawrenceburgh and the county of Decatur subscriptions are applicable to other portions of the road.

It is the intention of the company to push forward the construction of this road as rapidly as possible to its junction with the Madison and Indianapolis railroad, for the purpose of opening a communication between the railroads of Indiana and Cincinnati. The first is by far the most difficult division to construct. When the elevated table lands are gained but few obstacles are met with.

The following gentlemen constitute the board of directors:

Geo. H. Dunn, Dearborn Co., Pres't.
Walter Hayes, " "
David Nevitt, " "
Edmund Marshall, Decatur " "
J. E. Hamilton, " "
J. B. Foley, " "
A. R. Forsyth, " "
Thos. Sunman, Ripley " "
Jos. Wenterode, Shelby " "

Railroad Law.

Supreme Judicial Court of Massachusetts—Jordan vs. the Fall River Railroad.

This was an action for lost baggage. The delivery to the railroad and the loss was proved. The trunk lost contained \$375 in money besides clothing, etc. The principal question involved was the extent of liability of the defendants for the money in the trunk.

Fletcher, J., delivered the opinion of the Court. The exceptions taken to the ruling of the Court below, as to the liability of the defendants, as common carriers, upon the whole line of road from Boston to Bridgewater, and as to their being responsible for the acts of Fisher, must be overruled. The defendants had made arrangements by which their passengers were transported a part of the distance over the Old Colony railroad, yet, from this arrangement, they were nevertheless responsible for the safe transportation of passengers and their baggage.

Fisher must be considered as the agent of the defendants, they having no other person at the depot to take charge of the baggage, at that time, and Fisher having been previously in the habit of taking charge of the baggage of passengers going on the Fall river railroad. The next point presents more difficulty. It is well settled that the carriers of passengers are responsible for their baggage; yet there is a wide field for discussion and adjudication, as to what articles are properly to be denominated baggage. It has been decided, that such articles as are useful for personal convenience and such as are generally used, fall within the meaning of the term, and that a watch and jewelry are such articles. On the other hand, merchandise, and large sums of money taken for transportation, cannot be classed as baggage. But money, *bona fide*, taken for travelling expenses, and for personal use and convenience, we think may be taken at the risk of the carrier. We cannot say, that a traveller must carry all the funds necessary to defray his expenses, and for his personal use and convenience, about his person. Yet money intended for any other purposes cannot be considered as baggage, for which carriers are responsible. The verdict in this case for the whole amount of money, without reference to the use to which it was to be applied, must be set aside, and a new trial granted. Mr. Wellington for the plaintiff; Mr. Geo. Minot for the defendants.—*Boston Courier*.

Illinois.

Rail Road from Quincy to the Illinois River.

The completion of the Springfield and Meredosia rail road has excited a general interest on the part of the people of Quincy and of those upon the route of the proposed road for its continuation from the Illinois to the Mississippi. For the purpose of ascertaining the character of the route and the cost of the work, a careful survey has been made under the direction of W. P. Whittle and John I. Shipman, Esq.; the latter, a gentleman well known to the Engineering profession.

The distance from Meredosia to Quincy is 54.3 miles. The following are the estimates of its cost: Grubbing, Grading, Culverts, &c. of 54.3 miles, \$130,360 65 56 miles of track, including sidings, &c. 335,395 20

\$465,755 85

If to this be added 5 per cent for engineering and contingencies, 22,787 79 For turntables, road crossings, &c. 1,750 00 " water stations, wood-sheds and fixtures 1,500 00 " Engines, passenger and freight cars, .. 45,000 00 Depots, Engine house and work shops .. 10,000 00

The total cost of the road and equipments, ready for use, will become... **\$536,793 64**

The average cost will then be \$9,885.70 per mile.

The line adopted is in part the same upon which the State expended a large amount of money in 1837, and was abandoned from the inability of that state to carry out her scheme of public work. This will save a large sum to the Company, which now proposes to build the road. The proposed road traverses a fine agricultural country, and the coal and wooded tract in Brown county. From these sources and the passenger travel, the Engineers anticipate a large income upon its cost.

Illinois.

Alton and Sangamon Rail Road.

We understand that the Engineers of Alton and Sangamon Railroad have completed the surveys for the terminus in this city, and prepared the whole line for graduation twelve miles to Brighton. From Brighton, the location parties will move direct to Carlinville, and also examine a line crossing Macoupin creek below the junction of Coup's creek, which is supposed to offer advantages in some degree commensurate with the increase of

distance. It is believed that, if a crossing of the Macoupin can be found here, so as to admit of a location from Blackman's bridge, in the direction of the road to Carlinville, the flourishing villages of Chesterfield, Franklin, Fayette, and Carrolton, will be induced to concentrate their business at some point North of the Macoupin, and thereby greatly add to the business of the road. In this event an increase of subscription to the stock in that neighborhood might be reasonably expected.—*Alton Telegraph.*

AMERICAN RAILROAD JOURNAL.

Saturday, April 27, 1850.

Massachusetts Railroads.

It is easy to be wise after the event. It is always much easier to point out mistakes in the past, than to foresee them; so we may now with safety say, that for some time past, we have been aware of the causes which have made shipwreck of so many, and seriously impaired the value of most of the Massachusetts railroads. In fact we have not withheld our opinion entirely up to the present time.

Massachusetts, by many years, got the start of all other parts of the country in the construction of railroads, and she presented the most striking example that the world afforded of their influence in the production of wealth. Other portions of the country, with more abundant natural resources, did not feel the importance of artificial ones, and neglected the construction of these works until Massachusetts was covered with them.

The first lines built in that State of course occupied the best routes. These paid a high profit on their cost, and were eminently successful. This led to the construction of numerous other lines.—The high credit of these schemes, gave them command of unlimited means, and the vast expenditure of money required for their construction, amounting for many years to \$5,000,000 per annum, stimulated every branch of industry and trade, till a kind of business millenium was the result. Her people grew into a conviction, that in the railroads they had found the true philosopher's stone; that they were sure to pay wherever built, and whatever they might cost. That in addition to paying well, they increased, some ten-fold the value of the country they traversed—that they were bound to succeed however managed; and that on the whole, railroads were invented for the express benefit of Massachusetts in general, and Boston in particular: and that they alone were to be benefited by this newly discovered principle of infinite and unmitigated good.

The first railroads in Massachusetts were projected and built by those leading minds to whom she owes so much of her manufacturing and commercial greatness. But as railroads were bound to succeed, whether or no, these projects were not long confined to this class of men. They became the popular hobby, and every person almost in the community sought to distinguish himself by a scheme that promised the greatest results, and displayed the most magnificent dimensions. The abundance or scarcity of money (paper money, which is a mere credit) depends upon the prevailing sentiment of the community, and so long as everything went well, money could be had in abundance. Men could easily obtain the control of millions who had not the least experience in these pursuits, and who had never given any pledge of fitness for them, by success in any other. In addition to the schemes set afoot by such persons, railroads were found to be excellent opportunities for the employment of sons of capitalists, or for

that class of retainers for which a capitalist, as well as a prince must provide; young men of family and station, educated to a profession, who most have an employment and an income suited to their position in society. Scores of such persons boldly launched out upon the sea of business, with a charter of a railroad as their chart, with the credit of a capitalist for their means, and, it is hard to say with what, for a compass.

But it is found to be impossible to make in the long run only about so much profit out of a legitimate business, or to succeed in any kind of business without some fitness for it. In England it is admitted that the want of attending to these inexorable rules has cost that country more than \$600,000,000 in her railroads alone. So in Massachusetts. This bright sky of railroad prosperity began to show some clouds. Only an April shower was predicted. But the horizon instead of clearing up grew darker and darker. The income of railroads increased rapidly, but not half so fast as expenses.—The first dividends in railroads were usually declared upon the amount actually paid up when the first train ran over the road. The net income upon this cost, determined the rate of dividend. But the construction account being never closed, and the roads often not being more than half completed when put in operation, the progress of the work of construction added to this debt every year. When this indebtedness increased beyond the means of the company to manage, it was provided for by the issue of new stock. This increase of stock of course diminished the rate of dividends, and, and stockholders, only when they received a less per cent than formerly, began to inquire into the management of their property.

These inquiries gradually developed their true condition, and railroads as well as railroad securities began to be regarded with disfavor and distrust. Their wants continued, while their ability to supply them grew less and less. In this dilemma, as the patients grew worse, and as all the remedies of those in attendance failed, their friends resorted to a common expedient in Massachusetts, of obtaining the aid of great names, (for after all Massachusetts trusts in great names,) hoping that their influence would exorcise the demon that was preying upon the vitals of their roads. One great financial doctor was detailed to the Vermont Central, another to the Old Colony, etc. This change of attendance seemed to be attended with a good effect. The patients rallied for a time, but gradually sunk into a relapse more hopeless than the first disease. Great names were found impotent to effect a cure where the disease was not imaginary. Here the patients were dying of sheer inanition.—Some roads settled gradually down to their proper level. Others went with a crash that carry everything with them; and the stockholders are now beginning to find out that it costs a great deal of money to build a road, and a great deal to maintain one, and that the best roads upon the best routes will not pay unless they are prudently and skilfully managed. It is only the result that could have suggested and applied the remedy. These remedies cannot reach the past, they only can secure the future. They cannot restore the immense sums wasted, but they will prevent the recurrence of the mismanagement that caused them.

The Massachusetts people have certainly an excellent trait which is developed to a remarkable degree. They never give up beat, nor abandon a project so long as one cent more can be made by putting it in good condition, than by giving it up.

In the midst of all their disasters, their only thought is to find out the best course by which they can be repaired. The crisis in the Vermont Central was promptly met, and the road is in possession of sufficient means to place her beyond embarrassment. So with other roads. The stockholders in all the roads are now endeavoring to ascertain the nature and extent of the evil from which their roads are suffering and to apply the proper remedy.

But all things considered, Massachusetts has no reason to complain of her railroads. They have been the instruments which have given her both wealth and greatness; and she can afford to dispense with but a very few of them. Many of them may not pay remunerative dividends, but the public derive from them much greater good than their cost. Some should never have been constructed, at least upon the ground assigned for this. The Northern of New York, a Massachusetts road, is a case in point. It was projected for the purpose of giving to Boston the trade of the West, of making her the export city of western produce. Now this object can never be accomplished. Nature has assigned this privilege to New York, and it can never be wrested from her by artificial means.

The general success of Massachusetts railroads, under every species of management, is a full proof of their great capacity to pay, when well and prudently looked after. What other enterprises would have succeeded half so well with the same capacity and experience brought to their management? Commercial and manufacturing pursuits would not in the same hands, have sustained themselves half so long as have her railroads; and when these last shall come under the charge of suitable persons, and be managed in a legitimate manner, they will fully recover the position which, for want of this, they have lost.

By a typographical error in our last, we are made to say "\$5,000,000,000," instead of \$5,000,000, as the annual value of railroad iron imported into the United States.

British Provinces.

The people of New Brunswick and Nova Scotia are agitating the construction of Railroad as a means of bringing about a more prosperous state of affairs than exist among them at the present time. We learn from the St. John news, that twenty-five miles of the Railroad to connect St. Andrew's with Woodstock, has been contracted for by an American rail road contractor, who takes in payment one fourth in stock. A thousand men are immediately to be set to work; the cars, &c. have been ordered: the materials for the rails are now on their way to St. Andrew's—and it is expected that the cars will be able to run the first twenty-five miles in the course of the summer. A Rail road is also projected from St. John to Shediac, and we believe that a bill is now before the Provincial Legislature, authorising the Province to take one-half of the stock (£200,000.) It is believed that the balance could be readily obtained in St. John. The construction of this road would have the effect to urge forward a Rail Road through Maine to connect with the above. In such an event the Shediac Rail Road would be extended to Chedabucto bay, the most easterly point in Nova Scotia, which would become the point of embarkation of persons going to Europe. This would materially shorten the time now occupied by a voyage across the Atlantic.

The people of Nova Scotia are also taking measures to build a road from Halifax to Windsor, on the Bay of Fundy. The Legislature at its last

sitting, guaranteed that the Province should take one half the stock (we believe £150,000) after the remainder had been subscribed by a private Company. At the public meeting on Friday, the Provincial Secretary proposed that the citizens of Halifax should take £100,000 of the shares remaining. Resolutions were passed, unanimously; and the subscription books have already been put in motion.

We are glad to chronicle the efforts now making in this quarter, to do something to restore the prosperity this section once enjoyed. The projected Railroads, if they can be constructed, will do much to effect this. But railroads can do little compared with the advantages of free trade with the United States. Nova Scotia and New Brunswick are the last communities on this continent that need railroads, as almost every man in these Provinces, lives in sight of a ship's mast. They already enjoy the best possible means of transporting their products, but unluckily they have no sufficient market for them. Give for them as a market, the flourishing, commercial and manufacturing towns of the "States," and we should soon cease to hear any further complaints of distress much less of railroads. The causes of these embarrassments and the remedy for them are so plain, we wonder that they are not seen and acknowledged by every person who is suffering from them.

Free Passengers.

We have received a circular signed by John Wilkinson, W. Whittlesey, E. Corning and Thos. Y. Howe, Jr., a committee appointed at a meeting of the representatives of the several companies which compose the central railroad line from Albany to Buffalo, for the purpose of considering the subject of free passes, and of suggesting such a course as shall entirely change the general practice in this respect.

The committee asks the concurrence of the above roads in the following resolution:

"Resolved, That in order to change the practice of granting free tickets upon railroads, which has increased to an extent unfavorable to the business of the company, that on and after the first day of July next no person other than a director of, or one engaged in, the business of this company shall be allowed to pass over its railroad without the payment of the usual fare, and that all persons in the employment of this company are especially charged not to ask or receive a free passage on any other railroad or public conveyance."

Waiving any discussion as to the injurious extent to which free passages may have been granted, we will briefly examine the principles and the propriety upon which the system of free passes is founded.

The granting of free passes on railroads, is in part the interchange of good offices, universally practiced among persons engaged in similar employments or pursuits. As these are mutual, nothing is either gained or lost by the exchange. But as this exchange is not generally concurrent in point of time, the chief idea connected with the giving and receiving a free pass is, that it is an act of courtesy, testifying the good will and respect felt for the person receiving it; and possesses a higher value from these considerations, than from mere pecuniary advantage. Similar courtesies are, we may say, of universal practice among all pursuits and professions; and this fact alone presupposes a good reason for them. They are part of the good offices and courtesies of life, and are based upon a sentiment, the exercise of which gives to life its chief value.

Now how far it is for the interest of railroad companies to absolve themselves from these obligations, or how far it is the duty of railroad directors to limit the objects of such favors, we do not pretend to

decide; but we do not believe it is for their interest to discontinue them altogether. Confined within a proper limit they cost but little or nothing, as they balance each other; and they may promote a good feeling beneficial to the best interests of all parties. A person is, rightly regarded, as wanting in his duties who, in society, neglects the courtesies proper to his station. And if every person should do this, we should all become isolated from each other, and man would be brought into a state of universal hostility to his neighbor, instead of being united upon similar objects, for the common good of all.

Another numerous class to whom passes have been given is the public press. Here are no mutuality of pursuits; but passes have been granted upon an implied contract of indebtedness for services rendered to railroads, in carrying out the object of their projectors. With us the construction of a railroad requires the whole strength of the country it traverses. The whole community must be roused to the work.

But how shall every man be reached? By the press. This is the only medium by which the scheme can have universal publicity; and as the press to a great extent moulds and directs the public mind, its influence when arrayed in favor of a railroad project, is most potent. The editor of an influential journal can often effect more for a public work than a dozen leading men in a community. He does this, not by reason of a superiority of talent, but by virtue of his position. No individual or company can now hope to succeed in any great enterprise, without the aid of the press. It is the great and only agent by which society is strongly moved. In the case of a railroad, the publisher of a paper to be sure, like all other citizens, is interested in the work. He is glad to discuss the subject as a popular topic in which his readers are interested; but if we could take an exact account of the direct and pecuniary advantage which railroads have derived from the support of the press, with what the press have received from free passes in return, we are satisfied that the balance would be found to be largely in favor of the former. In allowing the press free tickets, railroads are but discharging an indebtedness which is in equity due from them.

We are aware that railroad directors are, to a certain extent, agents—entrusted with the interests of others, as well as their own. Of course they should confine themselves to what they have good reason to suppose would be the action of their principals, were such principals acting for themselves.

We know that free passes must give a much greater annoyance to a line under the control of several distinct companies, like the central from Albany to Buffalo, than to a road of equal length under one company. Each company may feel itself under obligations to a different class of persons, who may have no good claim to the courtesy of the others, but who may wish to make a ticket over one road available for the whole line. Unless some general rule is established, one company dislikes to refuse a courtesy another has granted, and thus the free list is liable to exceed, by many times, its proper limit. This inconvenience and injury which the roads now moving in this matter have undoubtedly suffered, is no argument against the principle, only against the abuse of the system.

This subject has of late attracted much attention in Massachusetts, where the science of railroads is pretty well understood. Most of these roads have

had a thorough overhauling, and in the irritated state of popular feeling, which has resulted from the enormous losses from the deterioration of railway property, and the diminished rate of dividends, every abuse has been sought to be corrected, and every improper privilege restrained.

In the outset the stockholders were for refusing any free passes whatever. But upon a full discussion of the subject, at their several meetings, the stockholders themselves became convinced that a total refusal to grant free passes would be injurious to their interests, and that the granting of them should be left to the discretion of the directors.—Such was the action of the stockholders of the Boston and Worcester railroad a few days since, and we believe that the action of this company reflects the views which prevail upon this subject in that section.

The view we take of this subject is, that it is for the interest of railroads to allow free passes. They should have this object in view, and confined within a limit that will secure it. We believe that they are founded in reason, and that if discontinued the same companies will gradually return to their use. The list should be extensively curtailed, but we do not believe it can be entirely dispensed with.

In either case we have no reason to complain.—The patronage and good will on our roads constitute our support—and none contribute to this more generally or more promptly than the companies from Albany to Buffalo; and if they will not allow us a "free ticket" to visit the "Falls" the next summer, (which, we are sorry to say, we fear would not be possible with one,) we luckily have sufficient patronage on the route to pay expenses both going and returning.

Machinery Oil.

WE the undersigned are now manufacturing an oil intended for the use of Railroads, Steamers and Manufacturing establishments. It has been in use several months and has given very general satisfaction. Our price is uniformly 70 cts. per gallon. Enquiries or orders attended to promptly. Address

ROBBINS, LANGDON & CO.,
133 Water street, corner Pine, New York.

CERTIFICATES.

Bridgeport, Nov. 7th, 1849.

Messrs. Robbins, Langdon & Co.,

Gentlemen: After about three months' trial of your oil, I have come to the conclusion to use it entirely on the engines on the New York and New Haven and the New Haven and Northampton Railroads for the following reasons:

1. It wears quite as long as sperm oil.
2. So far as I have tried it, it keeps the Journals equally cool as sperm oil.
3. I have no complaint from our men about cleaning the engines, and presume it is equally as easy to clean an engine by using your oil as it is in using sperm oil.
4. I can see no reason why it is not equal to the best of sperm oil for lubricating machinery.
5. There is in my opinion a very great saving to all parties in using your oil for lubricating machinery.
6. I believe it will stand cold weather better than any sperm oil. Very respectfully yours,

R. B. MASON, Supt. N.Y. & N.H. Railway.

Providence, March 22d, 1850.

Messrs. Robbins, Langdon & Co.,

Gentlemen: We have given your machine oil a thorough trial, and find that it possesses all the qualities that we could wish, as it works better than any sperm oil we have ever used. Our shafts that required oiling four times a day with the best sperm oil that we could get, work equally as well by the application of your oil twice a day, and your oil stands cold weather much better than any oil we have ever used. Our engineer having had years' experience in running and making engines, we put great confidence in his judgment, and he gives it as his opinion that your oil is fully equal to if not better than any he ever used; and we shall soon give you an order for more, as we do not want any other kind of oil as long as we can get yours.

Very respectfully yours,

JACKSON, CLARK & CO.

Steamer Bay State, Oct. 22d, 1849.

Messrs. Robbins, Langdon & Co.,

Gentlemen: In answer to your request for my testimony as to the machinery oil manufactured by you, I will say that I have used it for some time past on the Bay State, and am perfectly satisfied that your statement to me of its good qualities, is correct. As far as its lasting properties go, it wears equally long as sperm oil, runs perfectly free, and has no appearance of thickening. As seeing is better than hearing, I would recommend you to send your friends on board our boat, and they can then, by ocular demonstration, judge for themselves. Yours respectfully, JOHN GRAY,
Engineer of Steamer Bay State, Pier 3, N.R.

Steamboat Knickerbocker, Sept. 22, 1849.

Gentlemen: Mr. Hall, Agent of the Norwich and New London Steamboat Co., placed in my hands some of your machinery oil, which he desired me to use on the engine and other machinery, which I have done, and was so much pleased with the working, that I recommended the owners to give you their orders.

I have been using the article since August 19, and with perfect satisfaction, and I am well satisfied that your oil is as good as the best of sperm for lubricating machinery. I am yours very respectfully,

SAMUEL CARTER,

Engineer of Steamboat Knickerbocker, Pier 18, N.R.

To Messrs. Robbins, Langdon & Co.,
Oil Merchants, 133 Water street, New York.

Steamboat Worcester, N. York, Oct. 15, 1849.

Messrs. Robbins, Langdon & Co.,

Gentlemen: I beg to acknowledge the receipt of your letter requesting my opinion as to your oil for machinery, which I had not time to reply to previous to my return to Norwich. I have been using your oil on the engine and machinery of the Worcester with perfect success, and have much pleasure in testifying as to its good qualities. In my opinion, the journals keep cooler with your oil than with sperm, and it wears equally well. Should you at any time wish to refer to me as to your oil, I beg you will do so without hesitation. Yours respectfully, JAS. CROOKER.

Engineer Steamboat Worcester, Pier 18, N. R.

New York, August 3d, 1849.

Messrs. Robbins, Langdon & Co.,

Gentlemen: I received your letter in regard to your oil for machinery, which I handed to our engineer, and have much pleasure in sending you an extract from his letter to me on the subject: "I have applied the oil sent me upon our hot journals and cylinders, and find that they keep cooler with it than with sperm oil. I cannot find any fault with the oil, although I have watched it carefully. I have also tried it against an equal quantity of sperm oil, and find it wears quite as well." You are quite at liberty to show this extract to your friends, and shall be happy to give any further certificate you may require. WM. RIDER,

Treasurer Union India-rubber Co., 19 Nassau st. N. Y.

New York, March 22d, 1850.

Messrs. Robbins, Langdon & Co.,

Gentlemen: I have been using your machinery oil on the engine and other machinery of the Steamer Southerner running from this to Charleston, and find it equal to sperm oil. I shall continue the use of the same, and you are at liberty to refer to me at any time.

Yours respectfully, DAVID N. MAXON,
Chief Engineer Steamer Southerner.

Steamboat C. Vanderbilt, N. York, Oct. 11, 1849.

Messrs. Robbins, Langdon & Co.,

Gentlemen: In reply to your inquiries respecting the qualities of your machinery oil, I am happy to inform you that I have been using the article sent me for some time past, not only on the engine but on all other machinery connected with it: and from a careful and close examination, I am well satisfied that your oil is as good as the best of sperm oil for lubricating machinery. I have recommended Mr. Lockwood the agent of the company, to give you their orders.

Yours respectfully, JAMES BAKER,
Engineer Steamboat C. Vanderbilt, Pier 3, N.R.

Brooklyn, August 29, 1849.

Messrs. Robbins, Langdon & Co.,

Gentlemen: Your letter of the 29th was received, and I am happy to inform you that I have used your machinery oil throughout my establishment, and I am still of the opinion that it is as good as the best of sperm oil for lubricating machinery. I should be pleased at any time to have your friends witness the working, and I am sure, after once doing so, will give you their orders. Please send me another cask by the evening of the 3d, and by so doing you will much oblige.

W. M. BURDON, Manufacturer of
Steam Engines and other Machinery, 102 Front st.

A young man of experience in Surveying wishes a situation on a Railroad as an Assistant. Please apply at this office.

Spikes, Spikes, Spikes.

ANY person wishing a simple and effective Spike Machine, or a number of them, may be supplied by addressing J. W. FLACK,
March 6, 1850. Troy, N. Y.

Doremus & Nixon,
IMPORTERS AND FURNISHERS

RAILROAD CAR AND COACH TRIMMINGS.

Plain Garnet Plush. Fig. Garnet Plush (Butterfly pat.
"Crimson" "Crimson" (Elegant.
"Scarlet" " " (Gen. Taylor.

BROCATELLES.

Crimson Silk Brocatelles. Gold and Maroon do.
Gold and Blue " " Brown "
Silk and Wool " of every color.

MOQUETTES.

Of elegant designs and colors.
GERMAN CLOTH FOR CAR LININGS.

The most beautiful goods ever shown in this country, and the subscribers are the sole agents for the sale of them.

Oil cloths Enamelled with Gold. } These goods can be
" " Silver. } furnished in any
Do. Silver ground velvet printed. } dimensions req'd.

CURLED HAIR

Of every description and quality.
JNO. W. A. STRICKLAND, Agent.
New York, 1850. 1yl6

Notice to Contractors.

CENTRAL OHIO RAILROAD.

THE Line of this road between Zanesville and Newark, a distance of about 26 miles, will be ready for examination about the 1st of May next, and Sealed Proposals for the Graduation, Masonry and Bridging of the said road will be received at the office of the company, in Zanesville, until the 20th of May next.

The graduation must be completed by the 1st day of January next—the masonry by the 1st day of June, 1851—and the superstructure of the bridges by the 1st day of July, 1851. The wood work of the bridges not to be commenced until the 1st of January next.

This work will embrace some heavy rock cutting; two bridges across the Pataskala or Licking river, and one across its north branch, also several important cuts and embankments.

The bids may be predicated either upon CASH payments entirely, or upon 75 per cent. cash, and 25 per cent. in the stock of the company.

To contractors at a distance, it may be as well to observe that this work is a part of the Great Central Line, projected as an extension of the Baltimore and Ohio Railroad, from the Ohio river to Central and Western Ohio and Indiana.

The company hope to have the line from Newark to Columbus, 34 miles, ready for examination by the 15th of June next, and for contract by the 1st of July next.

By order of the Board.

ROBERT MAC LEOD,
Engineer in Charge.

Zanesville, April 18, 1850.

Notice to Contractors.

Bellefontaine and Indiana Railroad.

SEALED PROPOSALS will be received at the Company's Office in Sidney, Shelby Co., Ohio, on and after Wednesday, May 5th, 1850, for doing the Grubbing, Clearing, Grading and Masonry, of such portions of the BELLEFONTAINE AND INDIANA Railroad, as can be prepared for letting by the 15th.

The line extends from some point on the Cleveland, Columbus and Cincinnati Railroad, through MARION, BELLEFONTAINE and SIDNEY, to the STATE LINE, between Ohio and Indiana, a total distance of about 120 miles.

It is expected that the line from the eastern terminus to Marion, about 22 miles, and from Bellefontaine to Sidney, about 23 miles, will then be ready to let; and the remainder of the route as soon thereafter as it can be located and prepared.

Specifications and plans will be ready for inspection and all necessary information may be obtained on application at the Office of the Chief Engineer, in Marion, or to J. Pemberton, Resident Engineer, in Sidney, after the 5th of May.

By order of the Board of Directors.

W. MILNOR ROBERTS, Chief Eng.
Engineer's Office, Marion, Ohio,
March 18, 1850. } 15lf

Railroad Iron Wanted.

Virginia and Tennessee Railroad Office,
Lynchburg, Va., March 16, 1850.

PROPOSALS will be received at this Office until the 6th of May next, for the delivery in Lynchburg, of Iron Rails for the Virginia and Tennessee Railroad, to be manufactured in or near this town of Virginia Iron.

The said Iron to be made of the best pig metal, and to be delivered at the following times, and in the following quantities, viz: Six thousand tons in the year 1851, and the remainder (about 15,000 tons) for the whole road, equally, in the years 1852 and 1853.

Separate proposals will also be received for the delivery in Lynchburg, of pig metal, at times and in quantities sufficient for the manufacture of the rails above mentioned, said delivery to commence as early as the first of November, 1850.

The rails and the pig metal will be subjected to strict inspection; the rails are to weigh about 60 lbs. per yard.

At the same time, proposals will be received for the above quantity of Iron, manufactured anywhere else in America or in England, to be delivered in Lynchburg or Richmond, under the same general conditions as those prescribed for Virginia Iron, manufactured at Lynchburg. Satisfactory security will be required.

Proposals for delivering any portion of the above mentioned quantity, and at periods varying from those specified above, will be considered.

By order of the Board of Directors.

CHAS. F. M. GARNETT,
Chief Engineer.

15lf

To Contractors.

SEALED PROPOSALS will be received at the Office of the Nashville and Chattanooga Railroad Company in Chattanooga until the 20th day of May next, for the graduation and masonry of the Chattanooga Division of said Road—embracing a distance of 27½ miles.

The graduation will be heavy for about 15 miles, (in crossing Raccoon Mountain, and passing around Lookout Mountain bluffs), the balance, average work. The masonry will consist chiefly of cut stone Piers for Tennessee River Bridge, (about 4,000 Perches,) Piers for running Water Bridge, (about 2,000 Perches), and Pier for Lookout Creek Bridge, about 500 Perches.

Sealed proposals will also be received at the same time and place, for the graduation of 10 miles of the Eastern end of the Winchester Division—embracing some heavy work. Also the masonry of Elk River and Widow's Creek Bridges.

Plans and Profiles of the Work will be exhibited, specifications furnished, and all other desired information given, on application to Mr. James A. Corry, the Engineer in charge of the work, at the Company's Office in Chattanooga, from the 10th of May until the day of letting.

Before making bids the line should be thoroughly examined. The depths of the Cuts and Embankments can be ascertained from the centre stakes. The work to be commenced immediately after the letting. And that portion from Chattanooga to Lookout Bluffs to be completed by the 1st of December next. The other sections to be finished successively on toward the West end of the Division—the last by the 1st of October, 1851.

The most satisfactory testimonials will be required. The payments will be made in cash—reserving the usual 20 per cent. until the completion of the work.

By order of the Board.

JAMES H. GRANT, Chief Eng.
Nashville, Tenn., March 14, 1850.

PROPOSALS will be received at the offices of the Baltimore and Ohio Railroad Company, at Baltimore, Cumberland and Wheeling, up to Wednesday, the 22d day of May next inclusive, for the graduation and masonry of the portion of that road, extending from the bridge on the northwestern turnpike, over the Tygart's valley river, to a point on the south fork of Fish creek, near the mouth of Long Drain, embracing some 56 sections. Also the 8 sections between the mouth of Grave creek and the city of Wheeling.

A variety of work will be presented by the line to be let, which will include light and moderately heavy grading. Several short tunnels, and a considerable amount of bridge masonry.

Specifications may be had at the above named offices on and after the 1st of May ensuing, and further information obtained from the engineer upon the line.

Unexceptionable testimonials of character must accompany the bids, and the bidders are requested to state what other work, if any, they are engaged in, and when it will be completed.

The work must be energetically prosecuted.

By order of the President and Directors.

BENJ. H. LATROBE, Chief Engineer.
Baltimore, April 10, 1850. 16

Great American Engineering AND MECHANICAL WORK, just published in medium folio, 75 cts.

Part IV of "Specimens of the Stone, Iron and Timber Bridges, Viaducts, Tunnels, &c. &c. of the United States Railroads." By George Duggan, Architect and Civil Engineer.

The present part contains beautifully executed plans, and elevations, of the Starucca, Pa., (stone) Viaduct of 17 arches, 50 feet span each, grade line averaging 90 feet above the valley bed, with the specifications, estimates, &c. &c. Also plates of the details of the timber and iron work of the elegant timber arch 275 feet span, at Cascade Creek, Pa. on the line of the N. Y. & Erie R. R.

N.B.—This work is published by subscription of the most eminent in the engineering profession of the U. States, and will be completed in 12 parts, at 75 cents each to those who remit their names and subscriptions before the 1st June next—when the first 6 parts or one half of the work will be published—after which the price will be raised to \$1 per part.

To those making a present remittance of \$5, and the remainder \$4, when they have been supplied with the first six parts, the work will be forwarded regularly as published. Parties remitting \$9 shall receive it monthly post-free in any part of the United States.

"It is a work that was a great desideratum, and must prove of great benefit to the engineering profession generally, and especially to the tyro in practical engineering and mechanical knowledge; in truth it strikes us, that it would require years of labor and patient toil on the part of a young engineer to prepare the drawings, and collect the information that will be embodied in this work, and can now be secured for the trifling sum of \$9"—[Scientific Amer. March 16, 1850.]

In connection with this subject (Iron Railroad Structures) we take occasion to call attention again to Mr. Duggan's valuable and expensive publication, exhibiting drawings, with full descriptions of the various stone, iron and wooden bridges, viaducts, tunnels, culverts, etc., of all the Railroads in the United States. Mr. Duggan is an accomplished Architect and Civil Engineer, who came from Ireland to this country to exercise his profession; but finding Railroad construction here, in many respects, different from that he had been accustomed to in Europe, he applied himself to the study of our system; and the fruits of his researches and investigations embodied in this work, are well calculated to meet the exigencies of engineers, and to assist draughtsmen, bridge builders, mechanics and students. The work will be supplied to subscribers only, in 12 parts, at 75 cents each.—[N. Y. Journal of Commerce, Feb. 14, 1850.]

Published by **GEORGE DUGGAN,**
300 Broadway, New York.

To whom all communications should be addressed, and subscriptions forwarded.

FOWLER M. RAY'S Patent India-rubber Railroad CAR SPRING.

New York and Erie Railroad Shops.
Piermont, March 26, 1850.

This will certify that from practical experience in the use of Fowler M. Ray's India rubber Car Springs, I believe them to be far superior to any others now in use.

I have never known them to be affected by any change of temperature, as other Rubber Springs have been affected on this road.

I am at the present time repairing a Passenger Car that Mr. Ray and myself mounted with his springs about two years and eight months since.

The springs are at the present time as perfect, to all appearances, as when first applied to the car.

Respectfully yours,

HORACE B. GARDNER,
Foreman of the Car Shops.

Supt. Office N.Y. & H. R.R., }
New York, March 8, 1850.

This is to certify that we have used the Rubber Springs manufactured by Mr. F. M. Ray for the past twenty months, "both for Passenger and Freight Car Springs and Bumpers, and of different sizes," and have in every case given entire satisfaction, and I consider them the best spring now in use.

M. SLOAT, Supt.

Harlem R.R. Depot, }
New York, March 7, 1850.

This is to certify that we have used Mr. F. M. Ray's India-rubber Springs for over eighteen months, and find them to be easy and durable, and recommend them to railroad companies as being superior to anything we have tried.

J. M. SMART,
Foreman at 42d St. Depot.

Office of the New Jersey Railroad Co., }
Jersey City, March 7, 1850.

This is to certify that we have had Mr. F. M. Ray's India-rubber Springs in constant use under our cars, and as Bumper Springs for upwards of two years, and they have in every way given perfect satisfaction.

The present form of spring we deem far superior to the form of Disk, having used both forms, although we have none of those made in Disks at present in use.

We take pleasure in recommending these springs to all railroad companies.

J. P. JACKSON, Vice Pres.
New Jersey Railroad and Trans. Co.

Roxbury, February 28, 1850.

In compliance with your request, I take great pleasure in stating the result of my experience in the use of "Ray's Patented Vulcanised India-rubber Car and Engine Springs." We have used them nearly two years, and never had one fail in any way. The cold weather does not affect them, as it has other rubber springs we have used.

With sixteen years' experience as superintendent of machinery on the Boston and Providence railroad, I take pleasure in saying that your springs are the best we ever used, or I ever saw used elsewhere. We have 20 cars rigged with them, of which I can say that the springs are as good now as when first applied. I put 24 lbs. of the rubber under the forward end of one of our heaviest engines, taking off 250 lbs. of steel springs—it has been in use 18 months, and is in as good condition now as when first put under the engine.

Very respectfully yours,

GEO. S. GRIGGS,
Supt. of Machinery, Boston and Prov. R.R.

New York, March 11, 1850.

I have used the Patent India-rubber Spring purchased of Mr. Ray, upon the cars of the New York and New Haven Railroad, and have found them efficient and economical; and when applied to the axles and draw springs, believe them to be quite equal to any in use. I have found a combination of these springs with a steel spring under the transom beam a very satisfactory arrangement, and am now using this plan in all new cars.

Yours respectfully,
ROBERT SCHUYLER.

February 25, 1850.

From practical observation of the use of the India-rubber Car Springs, manufactured and sold by your company, we are entirely satisfied in their application, and do not hesitate to recommend them as elastic, durable, requiring no repairs for years, and retaining their consistency under all extremes of weather. We have applied them for the past two years, and consider them superior for all railroad purposes.

Yours truly,

OSGOOD BRADLEY, Car Builder, Worcester.
T. & C. WASON, do, Springfield.
DEAN, PACKARD & MILLS, do, do.
DAVENPORT & BRIDGES, do, Cambridgeport.

Office New Jersey Railroad Co., }
Jersey City, March 8, 1850.

FOWLER M. RAY, Esq.,

Dear Sir: In answer to your enquiries respecting the operation of the Vulcanised Rubber Springs, purchased by our company from you some two years since, I reply that they are superior to any spring in use, (that I have either seen or heard of).

The improved form of your spring, consisting of a solid piece of vulcanised rubber with bands on the outside, is far superior to your first form, consisting of disks of rubber with metallic plates interposed.

The last named form was tried, if you recollect, at a much earlier period; and then was replaced by your last form.

I have no hesitation in saying that your springs have given entire satisfaction, and most cheerfully recommend them to railroad companies throughout the country for the following reasons:

- 1st. The cost is 30 per cent. less.
- 2d. Saving of weight on each car of 8 wheels from 700 to 800 lbs.
- 3d. Less care and attention is required, as they are not liable to get out of repair.
- 4th. A great saving is secured in the wear and tear of the cars and rails from their great elasticity.
- 5th. The freedom from noise.
- 6th. There is greater safety in case of accident, as they cannot be broken.
- 7th. The comfort of passengers is enhanced sufficiently to pay the expense, waiving all the other reasons that I have given.

Should this fail to satisfy any person enquiring, you are at liberty to refer to me, No. 150 Washington St., Jersey City.

Yours respectfully,
T. L. SMITH, Supt.

Fall River, February 2, 1850.

In answer to yours of the 20th ult. I would say that this company has for some 10 or 12 months past been using "Ray's India-rubber Springs." We have applied them to both passenger and freight cars with uniform success. They have invariably preserved their elasticity and consistency through all the extremes of weather; and we are now applying them whenever the steel spring fails. I am well satisfied that they are particularly adapted for railroad purposes.

Very respectfully yours,

GEO. HAVEN,
Supt. Fall River Railroad.

Jersey City, March 9, 1850.

This is to certify that the present form of Mr. F. M. Ray's India-rubber Car Spring I consider far superior to the form of Disk, having used both forms.

I take pleasure in recommending these springs to all railroad companies.
DAVID H. BAKER,
Foreman of Car Shop of N.J. R.R. & Trans. Co.

Boston, March 5, 1850.

In answer to your enquiry about India-rubber Springs, I have to say that we have used them to a considerable extent on both freight and passenger cars, and also on several of our tenders; and I am very well satisfied that they answer all the purposes for which they are intended. I believe the India-rubber will soon supersede all other springs for cars and tenders.

Yours truly,

S. M. FELTON,
Supt. Fitchburg Railroad.

Old Colony Railroad Office,
Boston, March 6, 1850.

EDWARD CRANE, Esq.,

President New England Car Co.,

Dear Sir: In compliance with your request I would state that the Old Colony Railroad Comp'y have had in use upon their road, India-rubber Springs furnished by your company, for more than eighteen months past, during which time they have been extensively used under Passenger and Freight Cars, Locomotive Tenders, and for Drawer and Buffing Springs, with the most perfect success. The elasticity and consistency of the Rubber has never been unfavorably affected by either extremes of heat or cold—and from the experience which we have had in the use of Rubber Springs, I think them well adapted for railroad purposes—and therefore we have for some months past used Rubber almost exclusively, in all places where springs are required.

Respectfully yours, etc.,

JAS. H. MOORE,
Supt. O. C. Road.

Troy, February 27, 1850.

We have been using your India-rubber Car Springs for nearly two years—and we take pleasure in saying that in our opinion the rubber has to a certain extent already, and may eventually entirely supersede all other Springs for Railroad Car purposes. We now use it entirely for Draw Springs and Bumpers, considering it better and lighter than steel.

During our two years' experience in the use of it, we have not known any to lose their elasticity, or fail in any way; and we cheerfully recommend the rubber for railroad car springs.

Very respectfully,
EATON, GILBERT & CO.

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AN excellent opportunity now occurs to a practical Machinist, of WELL ESTABLISHED REPUTATION, and some capital, to engage extensively in the STEAM ENGINE, BOILER AND FOUNDRY BUSINESS.

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A practical Machinist, as a partner is required, to conduct the whole establishment; and only those FULLY COMPETENT need apply. Address (post paid) "MACHINE CO.," Box No. 741, Philadelphia, Pa. 1m14

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NEW YORK.

And in the principal cities and towns in the U. States.

The Premium of the AMERICAN INSTITUTE was awarded to the Etna Safety Fuse at the late Fair held in this city.

November 3, 1849.

American Railway Guide, AND POCKET-COMPANION FOR THE UNITED STATES;

CONTAINING Correct Tables, showing the time for starting of trains from all stations, distances, fares, etc., on all the Railway lines in the U. States; also many of the principal Steamboat and Stage routes—accompanied by a complete RAILWAY MAP. Price, single copies 10 cts., or \$1 per annum. Published on the first of every month, corrected from returns furnished by the Railway Superintendents throughout the Union.

This book has been compiled somewhat on the plan of Bradshaw's Guide, with such improvements in size, form and arrangement as have seemed desirable; and the publisher confidently hopes it will not be found liable to the objections of incompleteness and incorrectness, which have been made, and justly too, against various other similar works heretofore issued.

The subscriber having had the management of the NEW YORK PATHFINDER almost from its commencement, has enjoyed superior facilities in obtaining information relating to the thoroughfares of travel, and is therefore well qualified to prosecute with success the arduous undertaking of furnishing a complete and correct national guide book.

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February 9, 1850.

6m*

United States Railroad Guide and Steamboat Journal.

CONTAINING OFFICIAL TIME ADVERTISEMENTS,
Tables of Stations, Distances, Fares, Time, etc.,
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Published at 43 Ann street, New York.

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Of all Descriptions, Warranted Good.

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made very heavy for recutting.

☞ A full Stock of Steel and Files at all times on
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Sup't Transportation Providence and Worcester R.R.,
Providence, R.I. Has had 13 years' experience in Op-
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Agents for Avalon Railroad Iron and Nail Works.
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CLEAN COP WASTE, suitable for cleaning Rail-
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KENNEDY & GELSTON,

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COMMISSION MERCHANTS**WILLOW ST. WHARVES, PHILADELPHIA.
AGENTS for the sale of Charcoal and Anthracite
Pig Iron, Hammered Railroad Car and Locomotive
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Rams, etc., etc.
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PATENTEE OF THE

HERRON RAILWAY TRACK.Models of this Track, on the most improved plans,
may be seen at the Engineer's office of the New York
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SAFETY AND ECONOMY.****NORRIS' LOCOMOTIVE WORKS,
SCHENECTADY, NEW YORK,**Are Manufacturing Wrought Iron Driving, Truck,
Tender, and Car Wheels—made from the best Ameri-
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May 16, 1849.**Machinery Warehouse.**S. C. HILLS, No. 43 Fulton street, New York, has
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Chucks, Drills, Planers, Force and Suction Pumps;
Tenoning, Morticing and Boring Machines, Shingle
Machines, Bolt and Nut Machines, Belting, Oil, Iron
and Lead Pipe; Rubber, Percha and Leather Hose,
etc., &c.S. C. H.'s arrangements with several machine shops
are such that he can supply, at very short notice, large
quantities of machinery.
November 23, 1849.**George O. Robertson,
BROKER IN SCOTCH AND
AMERICAN PIG IRON;**Bar Iron, Lead, Spelter, Tin, Copper, etc.,
No. 4 Liberty Place, MAIDEN LANE,
(Near Broadway.)
NEW YORK**Manufacture of Patent Wire
ROPE AND CABLES,**For Inclined Planes, Suspension Bridges, Standing
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ANALYTICAL & CONSULTING CHEMISTS,
179 BROADWAY, NEW YORK.****SCHOOL OF CHEMISTRY.****IRON.****Railroad Iron.****3,000** TONS C. L. MAKE 63½ lbs. per yard,
now landing and to arrive.Also contracts made for future delivery of above su-
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300 Tons Banks Best Iron, Round, Square and Flat.

200 " English Bar " " " " "

10 " 9-16 Square Iron for Railroad Spikes.

For sale in lots to suit purchasers by

DAVID W. WETMORE.

New York, March 26, 1850. 3m

**SPRING STEEL FOR LOCOMOTIVES, TEN-
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in manufacturing spring steel from 1½ to 6 inches in
width, and of any thickness required: large quantities
are yearly furnished for railroad purposes, and wher-
ever used its quality has been approved of. The estab-
lishment being large, can execute orders with great
promptitude, at reasonable prices, and the quality war-
ranted. Address J. F. WINSLOW, Agent,
Albany Iron and Nail Works.**Railroad Iron.**THE Undersigned, Agents for Manufacturers, are
prepared to contract to deliver Rails of superior
quality, and of any size or pattern, to any ports of dis-
charge in the United States.COLLINS, VOSE & CO.,
158 South St.

New York, November 17, 1849.

Railroad Iron.

1,500 Tons weighing 58 lbs. per lineal yard.

500 " " 57 " " "

500 " " 56 " " "

500 " " 60 & 61 lbs. "

Also 2½x7 flat rails. All the above being of approv-
ed patterns. For sale byDAVIS, BROOKS, & CO.,
68 Broad street.N.B.—Rails imported on commission, or at a fixed
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Iron, Spring and Blistered Steel, Nail Rods, Best Re-
fined Bar Iron, Railroad Iron, Car Axles, Nails, Stove
Castings, Cast Iron Pipes of all sizes, Railway Chairs
of approved patterns for sale byCOLEMAN, KELTON & CAMELL,
109 N. Water St., Philadelphia.**TRENTON PIG METAL, MANUFACTURED**and for sale by the Bloomsburg Railroad Iron Co.
DUDLEY FISHER, Treasurer.
75 N. Water St., Philadelphia.**Railroad Iron.****500** Tons, afloat, weighing 57 pounds per lineal
yard, for sale byCOLLINS, VOSE & CO.,
158 South St.

New York, November 17, 1849. 1m46

Railroad Iron.**1675** Tons, weighing about 61 lbs. per yard, 90
tons, weighing about 52 lbs. per yard, and
825 tons, weighing about 53½ lbs. per yard, of the lat-
est and most approved patterns of T rail, for sale byBOORMAN, JOHNSTON & CO.,
119 Greenwich street.

New York, Feb. 25, 1850.

N.B.—B., J. & Co are also prepared to take con-
tracts for English rails, delivered in any of the Atlan-
tic ports of the United States.**Railroad Iron.**THE UNDERSIGNED, HAVING made arrange-
ments abroad, are prepared to contract for the deliv-
ery of Foreign rails, of approved brands upon the
most favorable terms.They will also make contracts for American rails,
made at their Trenton works, from Andover Iron, in
whole or in part, as may be agreed upon.They are prepared to furnish Telegraph, Spring and
Market Wire; Braziers and Wire Rods; Rivets and
Merchant Bars to order, all made exclusively from An-
dover Iron. The attention of parties who require Iron
of the very best quality for special purposes, is respect-
fully invited.COOPER & HEWITT,
17 Burling Slip, New York.

February 15, 1850.

Glendon Refined Iron.Round Iron, Band Iron, Hoop Iron,
Square " Flat " Scroll "Axles, Locomotive Tyres,
Manufactured at the Glendon Mills, East Boston, for
sale by GEORGE GARDNER & CO.,

5 Liberty Square, Boston, Mass.

Sept. 15, 1849. 3m37

**PATENT HAMMERED RAILROAD, SHIP &
BOAT SPIKES.**—The Albany Iron Works
have always on hand, of their own manufacture, a
large assortment of Railroad, Ship and Boat Spikes
from 2 to 12 inches in length, and of any form of head.
From the excellence of the material always used in
their manufacture, and their very general use for rail-
roads and other purposes in this country, the manu-
facturers have no hesitation in warranting them fully
equal to the best spikes in market, both as to quality
and appearance. All orders addressed to the subscrib-
ers at the works will be promptly executed.

JOHN F. WINSLOW, Agent.

Albany Iron and Nail Works, Troy, N. Y.
The above Spikes 1737 be had at factory prices, of
Erastus Corning & Co Albany; Merrill & Son, New
York; E. Pratt & Brother, Baltimore, Md.**LAP—WELDED
WROUGHT IRON TUBES**

FOR

TUBULAR BOILERS,FROM ONE AND A QUARTER TO SEVEN
INCHES IN DIAMETER.THE ONLY Tubes of the same quality and man-
ufacture as those so extensively used in England,
Scotland, France and Germany, for Locomotive, Ma-
rine and other Steam Engine Boilers.THOMAS PROSSER & SON, Patentees,
28 Platt street, New York.**Railroad Iron.**THE UNDERSIGNED ARE PREPARED TO
contract for the delivery of English Railroad Iron
of favorite brands, during the Spring. They also re-
ceive orders for the importation of Pig, Bar, Sheet, etc.
Iron.

THOMAS B. SANDS & CO.,

22 South William street,
New York.

February 3, 1849.

Iron Store.THE Subscribers, having the selling agency of the
following named Rolling Mills, viz: Norristown,
Rough and Ready, Kensington, Triadelphia, Potts-
grove and Thorndale, can supply Railroad Companies,
Merchants and others, at the wholesale mill prices for
bars of all sizes, sheets cut to order as large as 58 in.
diameter; Railroad Iron, domestic and foreign; Loco-
motive tire welded to given size; Chairs and Spikes;
Iron for shafting, locomotive and general machinery
purposes; Cast, Shear, Blister and Spring Steel; Boil-
er rivets; Copper; Pig Iron, etc., etc.

MORRIS, JONES & CO.,

Iron Merchants,

Schuylkill 7th and Market Sts., Philadelphia.
August 16, 1849. 1y33**Railroad Iron.**THE MOUNT SAVAGE IRON WORKS, AL-
legany county, Maryland, having recently pas-
sed into the hands of new proprietors, are now prepar-
ed, with increased facilities, to execute orders for any
of the various patterns of Railroad Iron. Communi-
cations addressed to either of the subscribers will have
prompt attention. J. F. WINSLOW, President

Troy, N.Y.

ERASTUS CORNING, Albany

WARREN DELANO, Jr., N.Y.

JOHN M. FORBES, Boston.

ENOCH PRATT, Baltimore, Md.

November 6, 1848.

Railroad Iron.THE SUBSCRIBERS ARE PREPARED TO
take orders for Railroad Iron to be made at their
Phoenix Iron Works, situated on the Schuylkill Riv-
er, near this city, and at their Safe Harbor Iron Works,
situated in Lancaster County, on the Susquehanna
river; which two establishments are now turning out
upwards of 1800 tons of finished rails per month.Companies desirous of contracting will be promptly
supplied with rails of any required pattern, and of the
very best quality.

REEVES, BUCK & CO.,

45 North Water St., Philadelphia.

March 15, 1849.

Monument Foundry.

A. & W. DENMEAD & SON,
Corner of North and Monument Sts.,—Baltimore,
HAVING THEIR

IRON FOUNDRY AND MACHINE SHOP

In complete operation, are prepared to execute faithfully and promptly, orders for Locomotive or Stationary Steam Engines, Woolen, Cotton, Flour, Rice, Sugar Grist, or Saw Mills, Slide, Hand or Chuck Lathes, Machinery for cutting all kinds of Gearing, Hydraulic, Tobacco and other Presses, Car and Locomotive patent Ring Wheels, warranted, Bridge and Mill Castings of every description, Gas and Water Pipes of all sizes, warranted, Railroad Wheels with best fagotted axle, furnished and fitted up for use, complete

Being provided with Heavy Lathes for Boring and Turning Screws, Cylinders, etc., we can furnish them of any pitch, length or pattern.

Old Machinery Renewed or Repaired—and Estimates for Work in any part of the United States furnished at short notice.

June 8, 1849.

Iron Wire.

REFINED IRON WIRE OF ALL KINDS,
Card, Reed, Cotton-flyer, Annealed, Broom, Buckle, and Spring Wire. Also all kinds of Round, Flat or Oval Wire, best adapted to various machine purposes, annealed and tempered, straightened and cut any length, manufactured and sold by

ICHABOD WASHBURN.

Worcester, Mass., May 25, 1849.

American and Foreign Iron.**FOR SALE,**

300 Tons A 1, Iron Dale Foundry Iron.

100 " 1, " " " "

100 " 2, " " " "

100 " " Forge " "

400 " Wilkesbarre " "

100 " "Roaring Run" Foundry Iron.

300 " Fort " " "

50 " Catoctin " " "

250 " Chikiswalungo " " "

50 " "Columbia" "chilling" iron, a very superior article for car wheels.

75 " "Columbia" refined boiler blooms.

30 " 1 x 1/2 Slit iron.

50 " Best Penna. boiler iron.

50 " "Padded" " "

50 " Bagnall & Sons refined bar iron.

50 " Common bar iron.

Locomotive and other boiler iron furnished to order.

GOODHUE & CO.,

New York.

64 South street

American Pig, Bloom and Boiler Iron.

HENRY THOMPSON & SON,
No 57 South Gay St., Baltimore, Md.,

Offer for sale. Hot Blast Charcoal Pig Iron made at the Catoctin (Maryland), and Taylor (Virginia), Furnaces; Cold Blast Charcoal Pig Iron from the Cloverdale and Catawba, Va., Furnaces, suitable for Wheels or Machinery requiring extra strength; also Boiler and Flue Iron from the mills of Edge & Hiles in Delaware, and best quality Boiler Blooms made from Cold Blast Pig Iron at the Shenandoah Works, Va. The productions of the above establishments can always be had at the lowest market price, for approved paper.

American Pig Iron of other brands, and Rolled and Hammered Bar Iron furnished at lowest prices. Agents for Watson's Perth Amboy Fire Bricks, and Rich & Cos. New York Salamander Iron Chests.

Baltimore, June 14, 1849.

6 mos

Wheel, Forge and Foundry Iron.

LOCUST GROVE Wheel Iron of great strength and superior chilling property.

Balt. Charcoal Forge Iron, from Patuxent, Curtis Creek and Gunpowder furnaces.

Elkridge Foundry Iron, of superior strength and softness. Anthracite and Charcoal Iron from Pennsylvania and Virginia. Gas and Water Pipes, Lamp Posts from Elkridge furnace.

LEMMON & GLENN,

62 Buchanan's Wharf, Baltimore.

6m9

Iron.

THE SUBSCRIBERS having resumed the agency of the New-Jersey Iron Company, are prepared to execute orders for the different kinds and sizes of Iron usually made at the works of the company, and offer for sale on advantageous terms.—

150 tons No. 1 Boonton Foundry Pig Iron.

100 " No. 2 do. do. do.

300 " Nos. 2 & 3 Forge do. do.

100 " No. 2 Glendon do. do.

140 " Nos. 2 & 3 Lehigh Crane do. do.

100 " No. 1 Pompton Charcoal do. do.

100 " New-Jersey Blooms

50 " New-Jersey Faggotting Iron, for shafts

Best Bars, 1/2 to 4 inch by 1/2 to 1 inch thick.

Do do Rounds and Squares, 1/2 to 3 inch.

Rounds and Squares, 3-16 to 1 inch.

Half Rounds, 1/2 to 1 in. Ovals & Half Ovals 1/2 to 1 1/2 in.

Bands, 1 1/2 to 4 inch. Hoops, 1/2 to 2 inch.

Trunk Hoops, 1/2 to 1 1/2 in. Horse Shoe & Nut Iron.

Nail Plates. Railroad Spikes.

DUDLEY B. FULLER & Co., 139 Greenwich-

st. and 85 Broad-st.

WILLIAM JESSOP & SONS' CELEBRATED CAST-STEEL.

The subscribers have on hand, and are constantly receiving from their manufactory.

PARK WORKS, SHEFFIELD,

Double Refined Cast Steel—square, flat and octagon.

Best warranted Cast Steel—square, flat and octagon.

Best double and single Shear Steel—warranted.

Machinery Steel—round.

Best and 2d gy. Sheet Steel—for saws and other purposes.

German Steel—flat and square, "W. L. & S." "Eagle" and "Goat" stamps.

Genuine "Sykes" L Blister Steel.

Best English Blister Steel, etc., etc., etc.

All of which are offered for sale on the most favorable terms by

WM. JESSOP & SONS,

91 John street, New York.

Also by their Agents—

Curtis & Hand, 47 Commerce street, Philadelphia.

Alex'r Fullerton & Co., 119 Milk street, Boston.

Stickney & Beatty, South Charles street, Baltimore.

May 6, 1846.

JOHNSON, CAMMELL & Co's Celebrated Cast Steel,

AND
ENGINEERING AND MACHINE FILES,
which for quality and adaptation to mechanical uses, have been proved superior to any in the United States. Every description of square, octagon, flat and round cast steel, sheet, shovel and railway spring steel, best double and single shear steel, German steel, flat and square, goat stamps, etc. Saw and file steel, and steel to order for any purposes, manufactured at their Cyclops Steel Works Sheffield.

JOHNSON, CAMMELL & CO.,

100 William St., New York.

November 23 1849.

Railroad Iron.

OF ANY PATTERN AND WEIGHT,

Of a Favorite Brand,

And deliverable in Bond, or Duty paid, at any Port of the U. S., contracted for on favorable terms, by

CHARLES ILLIUS,

20 Beaver St., New York.

Pig and other Iron also contracted for. Sole Agent for "Baxter's Machine and Burning Oil"—particularly adapted for "Railroads" and other Machinery.—Preferred to Sperra by the many now using it, and 25 per cent. cheaper.

CUT NAILS OF BEST QUALITY, BAR IRON

(including Flat Rails) manufactured and for sale by

FISHER, MORGAN & CO.,

75 N. Water St., Philadelphia.

Ogden & Martin's ROSENDALE CEMENT.

WE are prepared to enter into arrangements for supplying our Cement for public works or other purposes. We warrant the cement equal in every respect to any manufactured in this country. It attains a great degree of hardness, sets immediately under water, and is a superior article for masonry coming in contact with water, or requiring great strength.

For sale in tight barrels, well papered, at their office by

OGDEN & MARTIN, 104 Wall st.

February 16, 1850.

1y*

The above cement is used in most of the fortifications building by government.

To Steam Engine Builders.

THE Undersigned offer for sale, at less than half its cost, the following new machinery, calculated for an engine of 62 inches cylinder and 10 feet stroke, viz.

2 Wrought Iron Cranks, 60 inches from centre to centre.

1 Do. do. Connecting Rod Strap.

2 Do. do. Crank Pins.

1 Eccentric Strap.

1 Diagonal Link with Brasses.

1 Cast Iron Lever Beam (forked).

The above machinery was made at the West Point Foundry for the U. S. Steamer Missouri, without regard to expense, is all finished complete for putting together, and has never been used. Drawings of the cranks can be seen on application to

HENRY THOMPSON & SON,

No. 57 South Gay St., Baltimore, Md.

Sept. 12, 1849.

**P. H. Griffin,**

Corner of Steuben and James Sts. Albany, N.Y.
CONTINUES to manufacture copper flues for locomotive boilers, brewers' coppers, stills, tanner heaters, etc. Copper work in general, at the shortest notice. He has constantly on hand brass cocks, brass valves, copper pumps of every variety.

Orders promptly attended to.

1y14

To Railroad Companies.

FOR SALE—A Second-hand Locomotive Engine and Tender, of about 10 tons weight, in good order, and warranted to perform well. Any company wanting a cheap engine for a passenger or light burden train, will rarely meet with an opportunity so favorable as the present. The engine and tender are in perfect running order, and will be tested to the satisfaction of any one wishing to purchase. Price \$1,500.

Address **J. B. MOORHEAD,**

Frazer P.O., Chester county, Pa.

P.S.—The Engine can be seen by calling on H. Osmond & Co., Car-builders, Broad st., Philadelphia.

September 6, 1849.

India-rubber for Railroad Cos.

RUBBER SPRINGS—Bearing and Buffer—Fowler's Patent—Hose from 1 to 12 inches diameter. Suction Hose. Steam Packing—from 1-16 to 2 in. thick. Rubber and Gutta Percha Bands. These articles are all warranted to give satisfaction, made under Tyer & Helm's patent, issued January, 1849.—No lead used in the composition. Will stand much higher heat than that called "Goodyear's," and is in all respects better than any in use. Proprietors of railroads do not be overcharged by pretenders.

HORACE H. DAY,

Warehouse 23 Courtlandt street.

New York, May 21, 1849.

To Railroad Companies and Contractors.

FOR SALE—Two Locomotive Engines and Tenders, at present in use on the Beaver Meadow Railroad, being too light for their coal trains, but well calculated for either gravel or light passenger trains.

They weigh, in running order, about 8 tons each—having one pair of driving wheels 4 feet diameter, 4 truck wheels 30 inches diameter, with cylinders 10 in. diameter, and 18 inches stroke of piston. Tenders on 4 wheels. Address **JAMES ROWLAND,**

Prest. Beaver Meadow Railroad & Coal Co.,

Philadelphia.

or, **L. CHAMBERLAIN,** Sec'y,

at Beaver Meadow, Pa.

May 19, 1849.

20tf

Rosendale Cement.

THE NEWARK AND ROSENDALE LIME AND CEMENT CO. are now manufacturing at their works in NEWARK, N. J., and Ulster county, N.Y., a very superior article of Hydraulic Cement—also Lime Calcine Plaster, etc. Contractors and dealers will find it to their advantage to call or make application before purchasing elsewhere. All communications addressed to the subscriber, at Newark, N.J., will be punctually attended to.

1y*16

HENRY WILDE, Secretary.

Fire Brick.

THE Subscribers have constantly on hand Rafford's Stourbridge, Oak Farms Stourbridge, Lister, Wortley, Red and White Welsh Fire Bricks, common and fancy shapes. Also,

ROOFING SLATES,

from the best Welch quarries, and of all sizes. Also,

COAL,

of all kinds—Liverpool Orrell and Cannel, Scotch, New Castle, Pictou, Sidney, Cumberland, Virginia, and all kinds of Anthracite coals. Also,

Pig Iron, Salt, etc., etc., for sale at the lowest market price. Apply to

SAMUEL THOMPSON & NEPHEW,
275 Pearl and 43 Gold Sts., New York.

November, 23, 1849.

NORRIS' LOCOMOTIVE WORKS,
SCHENECTADY, N. Y.

THESE Works are in full operation in Manufacturing to order, Locomotive Steam Engines & Tenders, of the best principle and construction of material, using wrought iron heavy frames with pedestals welded thereto, and all parts of the engine made of the best wrought iron, except cylinders, pumps and boxes—obtaining greater durability, and carrying less weight over the road, than engines constructed of cast iron.

Wrought Iron Tires made any required size, and Tire Bars bent and welded with dispatch.

Chilled Wheels for Cars, Trucks and Tenders, made from the toughest iron.

Driving and Tender and Car Wheels fitted to Axles with Brass Boxes and Springs, and Railroad Machinery generally. Manufactured and for sale by

April 11, 1849.

E. S. NORRIS.

To the Proprietors of Rolling Mills and Iron Works.

THE Undersigned—Proprietors of Townsend's Furnace and Machine Shop, Albany—are extensively engaged in the manufacture of Machinery and fixtures for Iron, and Copper Rolling Mills, and Iron Works. Having paid particular attention to the manufacture of *Rolls (Rollers)*, both *chilled and dry-sand*, they feel confident that they can execute orders for such castings in a satisfactory manner. And to give assurance of this, they beg leave to refer to the following named persons, proprietors and managers of some of the most extensive rolling mills in the country, viz: Jno. F. Winslow, J. Tuckerman, H. Burden, W. Burr, J. & J. Rogers, Saltus & Co., J. B. Bailey, L. G. B. Cannon, Hawkins & Atwater, etc., etc.

F. & T. TOWNSEND.

Albany, August 18, 1849.

Passenger Car Linings.

THE Advertiser continues to make to order the Enamelled Car Linings which have been so highly approved the last three years, and are now exclusively used by all the Northern Railroads. No pains are spared to get out new styles, and adapt them to the tastes of every consumer.

Orders addressed to **CHARLES STODDER, No. 75 Kilby street, Boston**, will have prompt attention.
March 23, 1850. 2m

CAUTION.

RAILROAD COMPANIES and others are hereby cautioned against using or vending our improvement for easing the lateral motion as applied on Railroad Cars. Letters Patent having been granted to us in 1841, any party or parties so making or using said improvement without license from us will be proceeded against according to law.

DAVENPORT & BRIDGES.

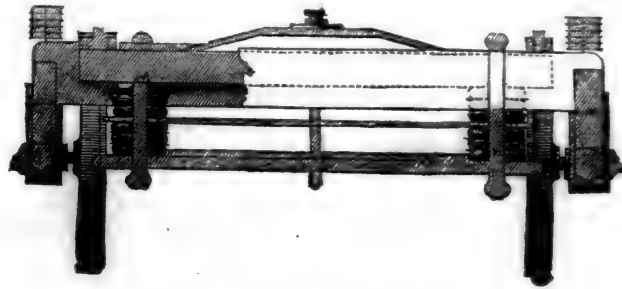
To Miners and Mining Companies.

THE undersigned would respectfully call the attention of those persons engaged in mineral operations on Lake Superior to the following list of articles which will be sold on accommodating terms, viz:

- 600 bbls. Corn fed No. 1 Mess Pork.
- 500 " Stall fed Mess Beef.
- 25,000 lbs. "Sugar cured canvassed" Hams.
- 2,200 " Dried Beef.
- 60,000 " "Kiln dried" Corn Meal.
- 500 bush. White "Field" Beans.
- 300 " Canada" Peas.
- 500 " Dried Apples.
- 100 bbls. and half bbls. "cucumber" Pickles.
- 50 " Sour Krout.
- 30 bush. Onions.
- 1,000 Beefs' Tongues Smoked and in Pickle.
- 10,000 lbs. "Mould" Candles.
- 10,000 " "Hard" Soap.

Also, a full and large supply of all articles that may be required by Mining Companies and those connected with them.

C. A. TROWBRIDGE,
127 Jefferson Avenue, Detroit, Michigan.

**FULLER'S PATENT
INDIA RUBBER CAR SPRINGS.**

RAILROAD COMPANIES are cautioned, before purchasing Springs, to examine the actual patents and judge for themselves.

Persons, under the Title of the New England Car Company, seeking fraudulently to invade Fuller's rights have put forth so many statements for the purpose of misleading the public, that an enumeration of some facts is absolutely necessary, for the purpose of putting persons interested upon their guard.

Fuller's patent is for the application of Discs of India-rubber with Metal Plates, for forming Springs for Railway Cars and Carriages—either one disc and two plates, or ten discs and plates, or any other number, are equally covered by the patent. Fuller is not bound to the use of short discs—he may use long discs and plates.

Ray's patent is simply and wholly the forming of air tight rubber cylinders, with hoops or bands round the outside, and the combination of elasticity of India rubber, with the elasticity of atmospheric air confined in the cylinder, and in no part of his patent is he authorized to use the form of spring which he is now fraudulently supplying to Railroad Companies. Such springs are direct and positive infringements of the very letter of Fuller's patent.

Fuller's patent is dated October, 1845, Ray's patent, August, 1848.

The spring patented by Ray never has been put in operation, and never can be made useful for Railroad cars.

A mere experiment, even if made, it is well known does not prove an invention; and it is ridiculous for such parties to hope to mislead the Presidents and Superintendents of Railroad companies, by claiming the invention because Ray alleges he made an experiment—which Fuller had made before him—had actually brought into working order, and obtained a patent for—and this too before Mr. Ray states he made his experiment—and that experiment not claimed to have been applied to a car or carriage.

Besides, the invention could not have been developed until India rubber, properly Vulcanised, could be made of a sufficient thickness. In the United States the art of vulcanising rubber by steam heat, (by which

means only can a body of rubber having any considerable thickness be vulcanised,) was not introduced until after the grant by the American government of the patent for springs to Fuller—whereas the process of vulcanising rubber by steam heat was invented in England about three years previously, and was used by Fuller there. This fact refutes entirely the claim of invention put forth by Mr. Ray, and proves the impossibility of his pretensions being true.

Fuller was the first and only inventor of the spring. A Mr. Dorr, whose connection with Mr. Goodyear is well known in this country, applied in England to Mr. Fuller, after he had published and patented his invention, and introduced another party for the purpose of obtaining the agency for the United States. They were furnished with a complete set of drawings and models, and with instructions to make arrangements for the supply of material of American manufacture—from that hour to the present not a single communication has been received from them. Some of these identical models have been traced into the hands of parties now seeking to invade Fuller's rights, and who have exhibited them as specimens of their own invention.

After this, the conveyance was made by Goodyear to certain parties here for the use for railroad springs of what he calls his Metallic rubber. Comment is unnecessary.

There are 5 or 6 different processes for the manufacture of vulcanised rubber, patented by as many different parties, some here, some in England, either of which would probably make good springs.

A large and powerful company has been organised under the name of "The Rubber Company," the particulars of which shall be given as they come to light.

An action has been commenced against three railroad companies for infringement; and all other parties will assuredly be prosecuted if they continue farther to infringe upon Fuller's patent.

W. C. FULLER,

The only persons authorised to supply the Springs are **G. M. KNEVITT, 39 Broadway, N. York,**
General Agent for the U. S.; and
JAS. LEE & Co., 18 India Wharf, Boston.
JOHN THORNLEY, Chestnut st., Philad.

Patent India Rubber Steam Packing.

THIS article, made by the subscriber, who alone is authorised to make it, is warranted to stand as high a degree of heat as any that has been or can be made by any person—and is the article which has made the reputation of India Rubber Steam Packing and the demand therefor. A large assortment of all thick-nesses requisite for any description of engines, steam pipes, valves, etc., constantly on hand and for sale by the manufacturer and patentee, who will give every information regarding its properties, mode of use, etc. at the warehouse. **JOHN GREACHEN, JR.,**
98 Broadway, opposite Trinity Church.
New York, October, 1849.

**Ibbotson, Brothers & Co's
CELEBRATED CAST STEEL**

AND

Best Cast Steel Royal Improved Files, well known as better adapted for Engineers' and Machinists' purposes than any now in use in the United States.

Every description of Square, Octagon, Flat and Round Cast Steel, Sheet, Shovel and Railway Spring Steel, etc., and Steel to order for any purposes—manufactured at their works in Sheffield—and universally known by the old stamp "Globe."

HENRY J. IBBOTSON, Agent,
218 Pearl st., New York.

February 25, 1850.

FAIRBANKS' RAILROAD SCALES.—THE subscribers are prepared to construct at short notice, *Railroad and Depot Scales*, of any desired length and capacity. Their long experience as manufacturers—their improvements in the construction of the various modifications, having reference to strength, durability, retention of adjustment, accuracy of weight and dispatch in weighing—and the long and severe tests to which their scales have been subjected—combine to ensure for these scales the universal confidence of the public.

No other scales are so extensively used upon railroads, either in the United States or Great Britain;—and the managers refer with confidence to the following in the United States.

Eastern Railroad.	Boston & Maine Railroad.
Providence Railroad.	Providence and Wor. Road.
Western Railroad.	Concord Railroad.
Old Colony Railroad.	Fitchburg Railroad.
Schenectady Railroad.	Syracuse and Utica Road.
Balt. and Ohio Railroad.	Baltimore and Susq. Road.
Phila. & Reading Road.	Schuylkill Valley Road.
Central (Ga.) Railroad.	Macon and Western Road.
	New York and Erie Railroad.

And other principal Railroads in the Western, Middle and Southern States.

E. & F. FAIRBANKS & CO.

St. Johnsbury, Vt.

Agents, } **FAIRBANKS & Co., 81 Water St., N. York.**

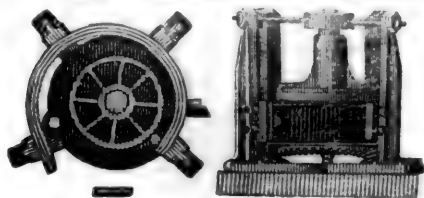
 } **A. B. NORRIS, 196 Market St. Philadelphia.**

April 22, 1849.

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MACHINERY.

Henry Burden's Patent Revolving Shingling Machine.



THE Subscriber having recently purchased the right of this machine for the United States, now offers to make transfers of the right to run said machine, or sell to those who may be desirous to purchase the right for one or more of the States.

This machine is now in successful operation in ten or twelve iron works in and about the vicinity of Pittsburgh, also at Phoenixville and Reading, Pa., Covington Iron Works, Md., Troy Rolling Mills, and Troy Iron and Nail Factory, Troy, N. Y., where it has given universal satisfaction.

Its advantages over the ordinary Forge Hammer are numerous: considerable saving in first cost; saving in power; the entire saving of shingler's, or hammerman's wages, as no attendance whatever is necessary, it being entirely self-acting; saving in time from the quantity of work done, as one machine is capable of working the iron from sixty puddling furnaces; saving of waste, as nothing but the scoria is thrown off, and that most effectually; saving of staffs, as none are used or required. The time required to furnish a bloom being only about six seconds, the scoria has no time to set, consequently is got rid of much easier than when allowed to congeal as under the hammer. The iron being discharged from the machine so hot, rolls better and is much easier on the rollers and machinery. The bars roll sounder, and are much better finished. The subscriber feels confident that persons who will examine for themselves the machinery in operation, will find it possesses more advantages than have been enumerated. For further particulars address the subscriber at Troy, N. Y.

P. A. BURDEN.

Railroad Spikes and Wrought Iron Fastenings.

THE TROY IRON AND NAIL FACTORY, exclusive owner of all Henry Burden's Patented Machinery for making Spikes, have facilities for manufacturing large quantities upon short notice, and of a quality unsurpassed.

Wrought Iron Chairs, Clamps, Keys and Bolts for Railroad fastenings, also made to order. A full assortment of Ship and Boat Spikes always on hand.

All orders addressed to the Agent at the Factory will receive immediate attention.

P. A. BURDEN, Agent,
Troy Iron and Nail Factory, Troy, N. Y.

RAILROAD WHEELS.

CHILLED RAILROAD WHEELS.—THE UNDERSIGNED are now prepared to manufacture their Improved Corrugated Car Wheels, or Wheels with any form of spokes or discs, by a new process which prevents all strain on the metal, such as is produced in all other chilled wheels, by the manner of casting and cooling. By this new method of manufacture, the hubs of all kinds of wheels may be made whole—that is, without dividing them into sections—thus rendering the expense of banding unnecessary; and the wheels subjected to this process will be much stronger than those of the same size and weight, when made in the ordinary way.

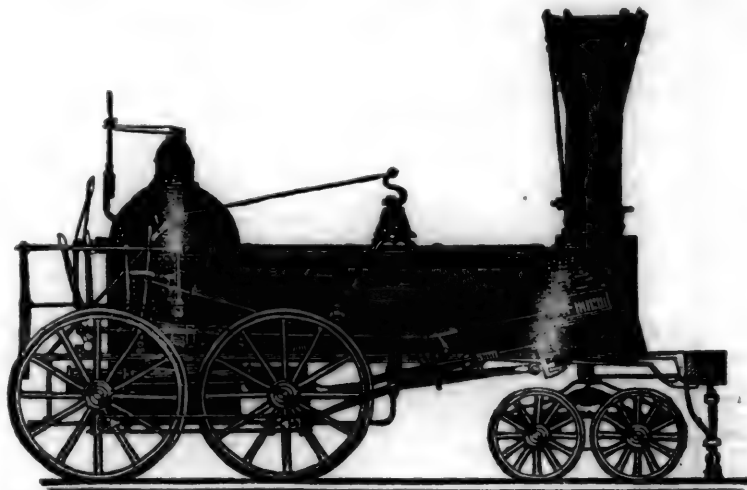
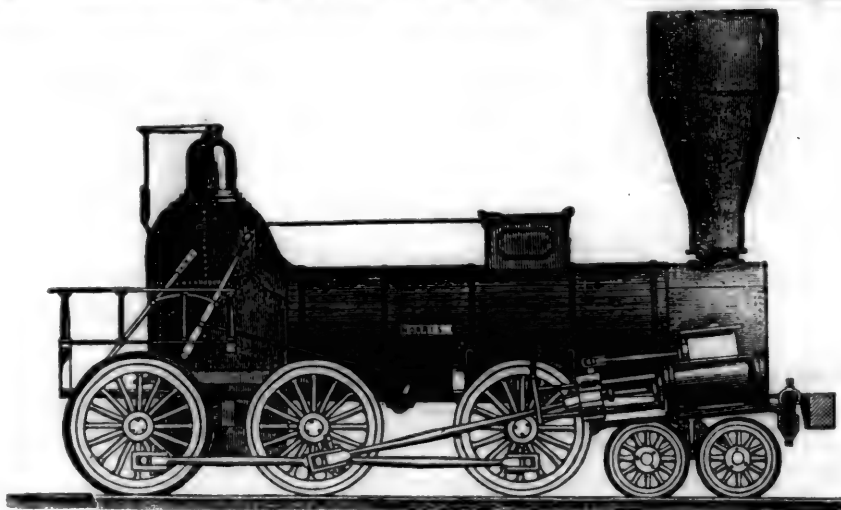
A. WHITNEY & SON,
Willow St., below 13th,
Philadelphia, Pa.

CHILLED RAILROAD WHEELS.—THE UNDERSIGNED, the Original Inventor of the Plate Wheel with solid hub, is prepared to execute all orders for the same, promptly and faithfully, and solicits a share of the patronage for those kind of wheels which are now so much preferred, and which he originally produced after a large expenditure of time and money.

A. TIERS,
Point Pleasant Foundry.

He also offers to furnish Rolling Mill Castings, and other Mill Gearing, with promptness, having, he believes, the largest stock of such patterns to be found in the country.

A. T.
Kensington, Philadelphia Co.,
March 12, 1849.

NORRIS' LOCOMOTIVE WORKS.
BUSHHILL, SCHUYLKILL SIXTH-ST., PHILADELPHIA,

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AMERICAN RAILROAD JOURNAL.

STEAM NAVIGATION, COMMERCE, MINING, MANUFACTURES.

HENRY V. POOR, Editor.

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American Railroad Journal.

PUBLISHED BY J. H. SCHULTZ & CO., 136 NASSAU ST.

Saturday, May 4, 1850.

Railroads, and Manufacturing in the West.

In our paper of the 20th ult. we endeavored to urge upon our people engaged in the construction of railroads the great importance of manufacturing the materials of their construction. We again recur to this subject for the purpose of showing the peculiar adaptedness of our country for manufacturing pursuits, particularly the west; and the influence which our vast coal fields, which are the great repository of power in giving direction to our industry and in developing our resources.

Up to 1847, the Indiana railroad system was wholly based on agricultural surplus products and foreign travel. For instance, the Madison road was the result of an obvious necessity of cheapening the transportation of the heavy, bulky and perishable staples of central Indiana to the Ohio river;

the line from Terre Haute eastwardly was organized to be a portion of the line extending from the seaboard to the Mississippi, and at first but little importance was attached to its home business.—The Madison road has proved highly profitable to its stockholders and beneficial to the section of country through which it passes. The appreciation of lands within five miles on either side of it has, as is said, been far greater than the entire cost of the road. This was the obvious consequence of increased and cheaper facilities of removing the surplus products of the land to a market. The new routes from Lawrenceburgh, Jeffersonville, New Albany and Evansville, that are now being pushed forward with vigor, (chiefly by the aid of land holders along the respective lines) to the interior counties, are the results of the benefits and success of the Madison road.

Notwithstanding all that was said of the vast amount of travel that would pass over a road from St. Louis to the seaboard and on the same parallel, the Terre Haute line moved along at a snail's pace, and the Vincennes route was abandoned. It was evident that through passengers and light freights would not pay dividends, and that lines of intercommunication, to be highly profitable, must connect districts of exchangeable commodities.

Since 1847, however, new elements of railroad progress have been developed in this State, and must, to a great extent, direct and control the movement in question.

The margin of the Great Illinois Coal Basin, as will be seen by referring to the geological map of Dr. Owen, is cut by the Ohio river a little east of the mouth of Anderson river, and by the Wabash about 15 miles north of the mouth of Coal creek. Its line is slightly curvilinear and passes through the western sections of the counties of Lawrence and Monroe, and extending northwest, approaches within 50 or 60 miles of the head of Lake Michigan. It will be observed that this line passes through the rich alluvions of the Patoka, north and south forks of White, Elk, Raccoon, Wabash and Vermillion rivers, that are not surpassed in fertility by any lands in the world, and which, perhaps, have a food producing capacity equal to the wants of all the manufacturers of Europe and America. Along this margin are coals, potters' marl, fire and building sandstones, limestone, iron stone, and bog iron ore, all in close proximity and above the plane of high water, all of the best qualities and inexhaust-

ible quantities. Such an important line of power and materials cannot, as we apprehend, be found elsewhere on the globe. None can come near it except, possibly, the western margin of the Appalachian coal field in Tennessee, Georgia and Alabama. Perhaps that district has coal and iron fully equal, but it has not the same food producing capacity.

It will be further remarked that this line runs, for some 300 miles, nearly north and south; that it passes parallels of different staples and of exchangeable products; that, at its southern terminus on the Green river in Kentucky, it is within an hundred miles of the cotton district; that it passes the great natural highways of the central sections of this valley and over the tobacco, the hemp, flax, corn and wheat districts; that at the northern point, south of Chicago, it almost touches the great chain of our northern lakes; that it comes within an attractive distance of the rich copper ores of Lake Superior, and that it runs into the lead district; it lies wholly in the temperate zone, and cuts the commercial and hydrographical centre of the great valley of the Mississippi.

Now, when we examine the map of Europe, and observe the concentration of capital and population—the railroads and canals—over the coal fields from the Severn to the Ribble: from Solway Frith to the Tyne and the Tees, and from Valenciennes to Leige; when we notice the growth of Cumberland and Pottsville, of Pittsburgh and Wheeling, and many other towns on the margin of the Appalachian coal field, we cannot but see that this margin of the Illinois coal field, so central and in so rich a food producing country, must inevitably and in a short time, become a great seat of manufacturing and railroad enterprise.

When the Terre Haute line was nearly abandoned, it was ascertained that Indianapolis and the rich district around it, could afford to transport coals from this margin, and the work was renewed with vigor. In a few years it will be completed and will enable Indianapolis to obtain fuel and motive power at one half the cost of either in Providence or Philadelphia. Manufacturing towns must spring into existence where the road cuts the beds of iron and coal. The Madison road is now pushing forward a branch to intersect this mineral district beyond Bloomington; the Jeffersonville road will form a connection with that branch; the New Albany road will cut the coal and iron strata near

Bedford; the Evansville road will pass through one of the inner strata of the great basin. The Wabash and Erie canal, at several points between Evansville and Point Commerce, passes through solid walls of coal, iron and fire clay; the Mount Carmel and Vincennes routes will soon connect the lower Wabash with these rich deposits. Wherever these lines do intersect the margin of this coal field, there will be manufacturing towns; and by and bye these towns will be connected with each other by a continuous road from Cannelton, near the mouth of Anderson river, on the Ohio, to Chicago. This, extended into Kentucky, eventually will—nay must—be the most important railroad line in the State, if not in the world. It will be over 300 miles in length; it will connect the lakes with the Ohio, and, joining the main lines of road between the Mississippi and the Alleghany mountains, it will connect the cotton, tobacco, hemp, subsistence and mineral districts.

It will, by and bye, be fully understood that, other things being equal, the true lines of artificial communication, especially when they are of any considerable length, are north and south, and to connect districts of exchangeable commodities, and people of different climates. The valley of the Mississippi is so level and expanded that natural forces and affinities can and will be exerted with their full power. That valley, as Mr. Webster has recently and forcibly said, is soon to be America.—It will soon have a population and wealth far beyond the seaboard States. It is idle then for the seaboard cities to expect that their roads, running west and on the same parallels are to be the main lines of commerce and travel in that valley. No artificial highway is likely to compete with the Father of Waters; for, even with every facility for making railroads, it is not probable that the western people can ever reduce freights on their roads to less than 1 cent per ton per mile. The rates of steamboat freights now averages less than 4 mills per ton per mile, and as business increases as coal is substituted for wood as fuel, and as greater system prevails, these rates must be largely reduced. The main trunk, or stem in that valley with which all others will connect must be from the lakes to the Gulf, and over the best route between the Appalachian chain of mountains and the lowlands of the Mississippi and its large eastern tributaries. This route, as we apprehend, will be on or near the margin of the Appalachian coal fields near Chattanooga. Perhaps there will be no need of more than this stem through Tennessee and Kentucky. South of the line of the former, the road will connect with New Orleans, Mobile, Charleston and Savannah—north of the line of the latter it will connect with Upper Mississippi, Lake Michigan and Lake Erie. The artificial system of intercommunication will there be a perfect whole. The territory, thus connected, has a capacity of providing food and clothing and materials for shelter to hundreds of millions of people, and these to supply the rest of the world with fabrics of cotton, wool and iron. The internal commerce of that territory will far exceed the foreign commerce of the world.

Perhaps for the first time in his history, man will then have full "verge and scope" to develop all his strength. Society there will be the commingled offspring of man—the most vigorous shoots from Saxon and Norman and Frank and Gothic stems have been planted in that fertile soil. From the shore of the Gulf of Mexico to that of Lake Superior will be acclimated almost every tree, shrub, plant and root that are desired by necessity, com-

merce and luxury, while these are now within reach the riches of almost every mine. The mind of man has powers too limited to define the progress and foretell the destiny of that valley and that people.

Railway Progress. Continued from page 269.

Meanwhile, signs of the coming times may be perceived. Sir John M'Neill, in Ireland, after making high priced lines, is now patenting "light locomotives and cheap railways." And in England, also, various original improvements are now practising after the originators have expended time, and money, and industrial energy in calling public attention thereto. Some are stimulated by the desire of direct money gain, others by the wish to steal a reputation that may bring money indirectly; and, as usual, those who sought to guide the public aright, when profits were only to be made by guilting it, are left to thrive as best they can, perchance to hunt down a new quarry for the vultures again to pounce on, so soon as the hunter has clutched it. Well, this too is an ordinance of providence.

In confirmation of what we have written, we now extract from the proceedings of the Institution of Mechanical Engineers at Birmingham, in October, the substance of a paper read before them by the engineer of the Eastern Counties line:

On the Economy of Railway Transit.

"The object of the present paper is to show that the locomotives now in use on most of the railways have outgrown the wants of the passenger traffic, and that the weight on the driving wheels of these locomotives, amounting in some cases to 14 tons, is perfectly unnecessary for the number of passengers conveyed in 99 cases out of 100.

"For the purpose of obtaining practical data upon this subject, the writer of the present paper procured a return of the number of passengers conveyed on the Eastern Counties and Norfolk railways, both main line and branches, by each train during the week ending 7th May 1849; this return showing the greatest number of passengers in each train at any one time.

"It appears from this return that the greatest number of passengers in any main line train at any one time was 231, and the least number 7; the greatest number in any of the branch line trains being 82, and the least number 3.

"And by another return from the books of the company it appears that there were conveyed on the Eastern Counties branch lines during the year 1847, 42,644 tons of passengers (calculating each passenger with his luggage at 168 lbs.) and that the weight of engines and carriages required to convey them was about 1,112,500 tons, being in the proportion of 26 to 1.

"On examining the coke returns it also appears that the main line engines consumed from 24½ to 40½ lbs. per mile, and the engines for working the branch line trains consumed from 16½ to 35½ lbs. per mile, varying of course with the size of the engine employed to do the work, the smallest engines invariably consuming the smallest quantity of fuel for the same work done. The average consumption of coke during the half year ending 4th July, 1849, was 31½ lbs. per mile for passenger engines, and 47½ lbs. per mile for good engines.

"These returns refer to a stock of about 200 engines, and a length of line of about 310 miles.

"Thus the writer came to the conclusion that it would be possible to construct a carriage and engine combined, of sufficient capacity for branch traffic, and by his advice the directors of the Eastern Counties railway gave orders to Mr. Adams to construct such a carriage, subject to the approval of Mr. Hunter, the locomotive superintendent.

"The carriage was accordingly build, and called the 'Enfield,' from the branch which she was intended to work.

"The engine has 8-inch cylinders and 12-inch stroke, driving wheels 5 feet diameter; distance between centres 20 feet; width of framing 8 feet 6 inches. The boiler is of the ordinary locomotive construction, 5 feet long by 2 feet 6 inches diameter. The fire-box is 2 feet 10½ inches by 2 feet 6 inches.

"There are 115 tubes of 1½ inch diameter and 5 feet 3 inches in length, giving a total of 230 feet heating surface in the tubes. The area of the fire

box is 25 feet, giving a total heating surface of 255 feet.

"The weight of this steam carriage is 15 tons 7 cwt. in working trim. The engine and carriage being combined, it is evident that the weight on the driving wheels is increased by the load carried, and that this weight increases in the same ratio as the load required to be taken.

"The extreme distance between the centres of the leading and trailing wheels being 20 feet, accounts for the steadiness of this machine; there is indeed no perceptible oscillation when travelling at the highest speed, and this verifies the observation 'that the steadiness of an engine depends not on the position of the driving wheel, but upon the length of the rectangle covered by the wheels.' This engine at the same time daily traverses curves of 5 or 6 chains radius.

"The 'Enfield' steam carriage was originally intended to convey 84 passengers; but as it was found that when she was put on as an express train the passengers increased in number, a 'North Woolwich' carriage was attached capable of conveying 116 passengers, and also a guard's break van, making provision altogether for 150 passengers, which is now her regular train taken at a speed of 37 miles per hour.

"This engine commenced her regular work about eight months' since, and the following return shows the miles run and coke consumed by this engine during the 7½ months regular working from Jan. 29th to Sept. 9th, 1849.

14,021 total miles run.

705 hours, running time.
1,457 hours, standing time.

2,162 total hours, in steam.

703 cwt. coke consumed in running.
408 cwt. " " standing.
286 cwt. " " getting up steam.

1,437 cwt. total coke consumed.

11.48 lbs. per mile average consumption of [coke].

"The 'Enfield' is in steam 15 hours per day, the fire being lighted about 6 in the morning and drawn at 10 o'clock at night. But of these 15 hours it appears by the return that she is engaged running only 5 hours, the remaining 10 being employed standing in the siding. It was found by experiment that the quantity of coke consumed standing was 32 lbs. per hour, and after deducting this and the quantity consumed getting up steam, it will appear that the actual consumption of coke running is under 6 lbs. per mile.

"It must also be particularly borne in mind that this consumption of coke includes the total goods and coal traffic on the branch, amounting to 1,410 tons, viz: 169 tons of goods and 1,241 tons of coal.

"The 'Enfield' steam carriage worked the 10 A. M. passenger train from London to Ely on 14th of June, a distance of 79 miles, taking behind her three of the ordinary carriages and two horse boxes: she arrived at Ely eight minutes before time, and the total consumption of fuel, including the getting up steam, was found to be 8½ lbs. per mile. The tubes of the boiler are only 5 feet 3 inches in length, and the economy of fuel is consequently scarcely at the maximum.

"Another engine on a similar plan to couple with a 40 feet carriage is now nearly ready, the tubes being 6 feet 6 inches long, from which is expected even more economical results.

"The result of the writer's experience is the conviction, that for express purposes, and for the larger portion of the branch traffic on railways, the light steam carriage is the best adapted and most economical machine, both as to first cost compared to the work done, and in working expenses.

"The repairs of the permanent way are also very much reduced, as may be easily imagined.

"On the Eastern Counties railway an engine and tender of say 30 tons, a break van, a first class carriage, and three third class carriages, conveying say 120 passengers, make a total weight of 59 tons, and the consumption of coke, as has already been shown, is on the average 34 lbs. per mile. A steam carriage weighing only 17 tons will transport the

same number of passengers at from 7 to 8 lbs. of coke per mile when the best proportions are attained."

Before and since that time the railway press has taken up the question with earnestness. The edition of Herapath's Journal of November 24th, has an article entitled "Cannot railways be worked cheaper?" and gives the particulars of the "Cambridge" engine, which was supplied to the Eastern Counties directors at a later period than the "Enfield." We extract from the Journal:

"Speaking of the Eastern Counties company, what are they doing? The iron hand of necessity has compelled them to look to their expenses of working. The heads of the new parties who have come into the management are being directed most earnestly and hopefully to a reform in the working expenses. They are seeing what can be done in the way of economy by lighter locomotives. They have invited ingenuity to their aid, and the result at present obtained is the production of a new light engine called the 'Cambridge,' of which we have collected the following facts:

THE "CAMBRIDGE."

The ordinary train consists of—

	T. cwt.	q.	lb.
The Cambridge engine, with 3 cwt. coke and 230 gallons water, (cost £1,200).....	9	11	3 8
One eight wheel carriage, as on the North Woolwich line, with tank underneath full of water, (cost £600.11).....	10	0	0
One six wheel first class engine, (cost £400).....	5	10	0 0
One four wheel break van, (cost £250.3).....	3	15	0 0
Total weight ready for use.....	30	6	3 8

The present accommodation is—

	First class.	Second class.
In the North Woolwich carriage.....	40	76
In the six wheel first class do.....	24	0
Total.....	64	76
		64
Equal.....		140

But the train being for 1st class only, the second class compartment is not used, the number conveyed at present, therefore, is 64. A North Woolwich carriage is now being fitted up for first class, and will hold 84 when altered, giving better accommodation and more space than in the present ordinary first class carriages. When this is finished, it will be unnecessary to run the six wheel first class carriage, which will reduce the weight of the train to 24 tons 17 cwt. The consumption of coke, which is at present 10-25 lbs. per mile, would be reduced to about 9-50 lbs.

The cost of working the train is as follows:

	£.	s.	d.
Total cost (see above), £2,450.			
Interest on capital at 5 per cent.....	122	10	0
Depreciation, 1d. per mile on 20,000 miles.....	62	10	0
Ordinary repairs, 1d. ditto.....	125	0	0
Coke, 20,000 miles at 10-25 lbs. per mile = 92 tons, at 23s.....	105	16	0
Wages, 6 days per week, at 11s. 6d..	172	10	0
Oil, tallow, waste, &c.....	10	10	0
Total cost per annum.....	£598	10	0
for 20,000 miles = 7-18d. per mile.			

"The cost of working this train with the new first-class North Woolwich carriage (doing away with the 6-wheel carriage), will be as follows:—

Total cost £2,050.

	£.	s.	d.
Interest on capital, at 5 per cent.....	102	10	0
Depreciation, 1d. per mile, for 20,000 miles.....	62	10	0
Ordinary repairs, 1d. ditto.....	125	0	0
Coke, 20,000 miles at 9-50 lbs. per mile = 85 tons, at 23s.....	97	15	0
Wages, 6 days per week, at 11s. 6d..	172	10	0
Oil, tallow, waste, &c.....	10	5	0
Total cost.....	£570	10	0
for 20,000 miles = 6-84d. per mile.			

"In the expense of 7-18d. per mile is included an

item of considerable amount for interest at 5 per cent. on the capital cost of the train. Mr. Cabry says, the York and North Midland trains are run for 9-1d. per mile; but in that expense there is not the charge of interest on the capital cost of the trains, which must be heavy, and coke on the York and North Midland is had for 11s. 6d., while on the Eastern Counties the price of it is 23s., or just double.

"It is calculated, as already mentioned, that by taking off the 6-wheel carriage this light train can be run for 6-84d. per mile, including interest on capital cost of the train.

"Beyond the advantage of a most considerable saving in the expense of running trains, light engines will not knock about the rails so much. The whole train of the 'Cambridge' is not so heavy as some of our ponderous engines; the engine of the 'Cambridge' is about a third of the weight of those great machines.

"The 'Cambridge' generally performs the distance between London and Norwich (126 miles) in about four hours, that is, a speed of 30 miles an hour.

"The Cork and Bandon are another company striving to bring down their working expenses.—They, like the Eastern Counties, are experimenting—if matters of fact can be so called—with light engines. They are running light engines on their line, and we understand with success.

"It is only where parties are obliged from necessity to economise, and where, too, they have the goodness of head and heart to bestir themselves, that we find working expenses are reduced, or can be reduced. The majority, in the receipt of splendid revenues, but who, nevertheless, pay small dividends, say, 'Pooh! it's all nonsense; these are our expenses, and we cannot do the work for less.' We, however, have a very strong impression, that in nine cases out of ten they can most materially reduce their expenses, and yet be even more liberal in their little necessary or useful expenses. In a word, by looking (with the view of thinking and acting) to the cost of trains as the primary object, and other large expenses as secondary objects, they may realize larger profits and even work their lines better."

REPORT

*On Recent Applications of the Wave Principle to the Practical Construction of Steam Vessels. By Mr. J. Scott Russell.**

During the last year I have had more than one opportunity of applying the wave principle to the construction of steam vessels. There is one case, however, in which I have been able to apply it to practice under circumstances of greater complexity and difficulty than have ever occurred to me, and where it has been successful in overcoming difficulties to a greater extent, and in a more decided manner than heretofore.

During the last year a very difficult problem was proposed to me. It was this:

To build a steam vessel that should be fast without great length, a good sea boat without drawing much water, and to carry a great top weight, and yet swim very light. Besides, this vessel was to be able to go backwards as well as forwards equally well; and, though a small boat, was to contain great accommodation. The problem is one to which the wave principle is far from seeming peculiarly applicable. In the first place, it is well known that the wave principle prescribes a different form of bow from that of the stern, in order to obtain most speed with least cost of power. In the second place, it is known that a high speed requires, on the wave system, a very considerably greater length than was here allowed for the entrance of the vessel or the lines of the bow. It would, therefore, seem at first to be a case that would prove too difficult for the successful application of the wave system.

There is one more feature in the case which gives it interest. At the same time the same problem was worked out by another party on another plan of construction, not on the wave principle. Another vessel was built under similar conditions, with engines of the best construction, made by one of the most eminent engineers in England. Both

* From the London Civil Engineer and Architects' Journal, for November, 1849.

of these vessels were built at the same time, and tried under similar circumstances; therefore, here was a case in which the practical value of the wave principle has been brought to a test more direct and less questionable than any that was likely to have occurred—and, therefore, more important to be placed on the records of the British Association.

The first question which will naturally occur to a member of this Association, who recollects this principle, will be this: How could you apply the wave principle in a vessel made to go equally well both ways? The first answer is ready—it is this, that the vessel cannot be made to go only one way—seeing that, in one case, she would have a best possible bow and a best possible stern, and in the other case could have neither. The next point is this; that in both cases of bow and stern, it was necessary to have a compromise. Each required to be in turn bow and stern—this was accomplished in the following manner: If there be any point which has more forcibly struck me in the application of the wave principle than another, it is the flexibility of the wave principle—the extent to which it admits of deviations from its strict rules without losing the benefit of its assistance. If it had unluckily been true of this system, that it prescribed an exact mathematical solid in its three dimensions, (like Newton's solid of least resistance,) to which implicit adherence was imperative on pain of losing all the benefit proffered, then, indeed, the system would have been, (like Newton's) of little use, from the fact that, from causes independent of resistance, ships cannot be solids of revolution, consistently with other qualities. The wave principle, on the contrary, possesses wonderful flexibility; first, from the circumstance of its prescribing lines in one plane only, and so leaving the other two dimensions in the hands of the practical constructor—so that the sections of the vessel in one plane being given by the system, the sections in two others are at the service of the constructor. I had, in this case, to lay down for both ends of the vessel, that which is best for a bow and that which is best for a stern, at the given velocity. I had next to place relative values on bow resistance and stern resistance. I had next to single out from between those two lines one which, taken either as bow or stern, would deviate least from either, and so have least resistance on a mean of both directions. This, therefore, the wave principle did; it gave the limits, and gave also the choice of a series of means, all more or less suited to the purpose intended. I have now shortly to state the practical details by which this process was carried into effect, and the results arrived at in consequence.

The engines of the vessel, as well as the vessel, had to be constructed by my partner, Mr. A. Robinson, and myself, and we were enabled to adapt the one to the other with greater ease and certainty than in all likelihood we could have done had the engineer been separate from the ship builder. In our case, the engine was considered and made an actual portion of the ship, and the ship of the engine. It will be fair, therefore, to deduct from the good effects attributed to the wave form of the ship such advantages as we possessed in building both engines and boilers, and ship, as one whole; still it is fair to remember, on the one side, that the builders of the engines with which ours had to compete, have been celebrated for their efficiency, and for the large actual power they have developed, when compared with their nominal power. It should also be remembered, that the builders opposed to us had previously built the fastest boats of their district. The results obtained are as follows: both vessels were about 150-55 feet long; 22-22½ feet beam; four feet draft of water; 240 tons displacement; 150 horse power, nominal; propelled by oscillating cylinders of 48 inches diameter, with the same proportion of stroke to paddle wheel in both cases; and with only such differences as the engineers and ship builders in each case considered to be most likely successful in carrying out the execution of their work to the best advantage. The terms prescribed to both builders by the engineer of the proprietors being identical, and with only such latitude as should not form an obstacle to whatever might seem best suited for obtaining greatest efficiency.

Results of experiments on Velocity with equal power.
Wave vessel. Competing vessel.
Speed....16.13.....15.03 miles per hour.
Power....20.30.....19.90 velocity of wheel.

Loss.... 4.17..... 4.87 slip of wheel.

These are the results of accurate trials, at the measured mile, both made with the tide and against it. It is important to observe the amount of slip, as it serves to show that it was no deficiency of the engine power which caused the difference, both engines having gone at, as near as possible the same speed. In order that the statement just given may not lead to false conclusions, it is necessary to state what were those minor differences in vessel and engine which each constructor adopted as tending to greater deficiency. The wave vessel had a flatter floor, and considerably squarer on the midship section, which was done for diminishing the depth of water as wanted for her use. In the other vessel, the consideration of draft of water was rejected or overlooked, and a finer midship section taken, although with a larger draft of water. In one case also the rudders were considered as part of the length of the vessel, and treated accordingly, and in the other case rejected from it. In the engines also, although the diameters of the cylinders were identical, the stroke of the wave vessel was somewhat longer than the other, but the diminished effective diameter in the shorter stroke reduced them to nearly the same proportion. Thus far, the experiments given only serve to prove that, practically, a considerably better result has been obtained by a steam vessel built on the wave principle, than a competitor built under conditions that are perfectly identical, in so far as the public and the owners are concerned. But as regards the purely scientific question, I shall add two other experiments with the wave vessel, which furnish data of a more permanent and precise nature—one at a higher, the other at a lower velocity:

Experiments on the Wave Vessel.

I.—Velocity of vessel, 15.14 miles per hour.
wheel, 18.17

Slip, 3.03

II.—Velocity of vessel, 16.50 miles per hour.
wheel, 21.20

Slip, 4.70

The area of midship section immersed was 89.4 feet.

The surface of vessel immersed was 3080.0 feet.

The area of paddle floats was 26.8 feet.

The conclusion which I deduce from these last experiments is this, that, by means of the wave form, one may obtain a form of which the resistance shall be represented by $R = 1.20 A H S$, instead of $R = 1.6 A H S$, which is the lowest number given in any previous system of construction; A , being the area of midship section, H , the height due to the velocity of the vessel, and S , the weight of a cubic foot of water.—*Proc. Brit. Assoc.*

British Association for the Advancement of Science.

"On the Friction of Water," by R. Rawson, Esq.—The object of this paper is to ascertain the friction of water on a vessel or other floating bodies rolling in water. For this purpose, experiments have been made upon a cylindrical model—whose length is 30 inches, diameter 26 inches, and weight 255.43 lb. avoidupois—in the following manner:—The cylinder was placed in a cistern, in the first place, without water, and made to vibrate on knife-edges passing through the axis of the cylinder. A pencil projecting from the model in the direction of the axis of the cylinder on the surface of another moveable cylinder marked out upon paper placed upon this last cylinder the amplitude of each oscillation. The cylinder was deflected over to various angles by means of a weight attached by a string to the arm of a lever fixed to the cylindrical model:

Angles of deflection.	Angle to which the model vibrated.
22° 30'	22° 24'
22 10	22 6
21 54	21 48
21 36	21 30
&c.	&c.

When the cylinder oscillated, in all circumstances the same as above, except being surrounded by salt water, the amplitude of oscillations was as follows:

Angle of deflection.	Angle to which the model vibrated.
22° 30'	22° 0'
21 36	21 3
20 48	20 16
&c.	&c.

Clearly showing that the amplitude of vibration when oscillating in water is considerably less than when oscillating without water. In the above instance there is a falling off in the angle of amplitude of 24', or nearly half of a degree. This amount has been confirmed by several experiments made with great care; and it appears only fair to attribute this decrease in the amplitude of oscillation to the circumstance of the friction of the water on the surface of the cylinder. The amount of force acting on the surface of the cylinder necessary to cause the decrease in the amplitude of oscillation shown by the experiment was calculated; and the author thinks that this amount of force is not equally distributed on the surface of the cylinder. In consequence of this, he thought the amount on any particular part might vary as the depth. On this supposition, a constant pressure at a unit of depth is assumed. This, multiplied by the depth of any other point of the cylinder immersed in the water, will give the pressure at that point. These forces or moments being summed by integration, and equated with the sum of the moments given by the experiments, we have the following value of the constant pressure at a unit of depth: .0000469.—This constant is another experiment, the weight of the model being 197 lb. avoidupois, and consequently the part immersed in the water was very different from the other experiment, was .0000452, which differs very little from the former—showing that the hypothesis assumed in the computation is not far from the truth.

"Report on the oxidation of Rails in and out of use, determining the Loss by Abrasion," by Mr. R. Mallet.—Mr. Mallet has paid much attention to this subject, and he has concluded that the top surface of a railway bar in use is constantly preserved in a state of perfect cleanliness, freedom from oxidation and polish; while the remainder of the bar is rough-coated originally with black oxide, and soon after with red rust (peroxide and basic salts). Not only is every metal electro-positive to its own oxides, but, as established in the second report on the action of air and water on iron, the polished portion of a mass of metal partially polished and partially rough, is primarily corroded on the rough portion. Hence a railway bar while in use is constantly preserved from rusting by the presence of its polished top surface. Such polished surface has no existence on the rail out of use. The upper surface of the rail in use is rapidly condensed and hardened by the rolling of the traffic over it; and it is also shown in the above report, that, all other circumstances being the same, the rate of corrosion of any iron depends upon its density, and is less in proportion as this is rendered greater by mechanical means. As every metal is positive in its own oxides, the adherent coat of rust upon iron, while it remains, powerfully promotes the corrosion of the metal beneath, and this in a greater degree in proportion as the rust adherent is of greater antiquity. It has been shown that the rust produced by air and water, which at first contains but little peroxide, continues to change slowly, and becoming more and more peroxidized, becomes more and more electro-negative to its own base. Now, the rust upon a railway bar out of use continues always to adhere to it, and thus to promote and accelerate its corrosion; while the rust formed upon a railway bar in use is perpetually shaken off by vibration, and thus this source of increased chemical action removed. To recapitulate, railway bars forming part of a long line, whether in or out of use, corrode less for equal surfaces than a short piece of the same iron similarly exposed. Rails in use do corrode less than those out of use. The difference is constantly decreasing with the lapse of time. The absolute amount of corrosion is a source of destruction of the rail greatly inferior to that due to traffic. It is highly probable that the electrical and magnetic forces developed in the rails by terrestrial magnetism, and by rolling traffic, react in some

way upon the chemical forces concerned in their corrosion; and that, therefore, the direction of lines of railway in azimuth is not wholly indifferent as respects the question of the durability of rails. The author concludes with two practical suggestions, deducible from the information obtained:—1st, Of whatever quality iron rails are rolled, that they should be subjected prior to use to an uniform course of hammer-hardening all over the top surface and sides of the rails; and, 2dly, that all railway bars, before being laid down, should, after having been gauged and straightened, be heated to about 400° Fahrenheit, and then coated with boiled coal tar. This has been proved to last more than four years, as a coating perfectly impervious to corrosive action, while constantly exposed to traffic.

Boston Natural History Society.

CHEMICAL ANALYSIS OF ASPHALTUM FROM NEW BRUNSWICK, BY C. T. JACKSON.

On the 16th of last March, Henry W. Fuller, Esq., of Boston, sent me a box of specimens of a new kind of fuel recently discovered in New Brunswick. It was regarded as cannel coal of a peculiar kind.

This substance proved to be a very beautiful variety of asphaltum. It is a jet black, glossy, and free from smut. It breaks with a broad conchoidal fracture, like obsidian, and presents a brilliant surface.

It is a little softer than rock salt, which scratches its surface. Its specific gravity is 1.007.

It softens and melts when exposed to heat in closed vessels. When inflamed it does not run, but burns freely with a bright yellow flame, and a little smoke. Heated in a glass flask it gives off an abundance of bituminous liquid analogous to petroleum, and leaves a very light and bulky coke, of a brilliant black color, and very porous. When exposed to heat in a covered platinum crucible, an abundance of carburretted hydrogen gas is given off, which burns with a large and brilliant flame, having a high and illuminating power.

The asphaltum is but slightly acted upon by alcohol or by ether, yielding a little yellowish matter which is obtained by evaporation of the solution. Oil of turpentine dissolves a considerable quantity of the asphaltum, forming a varnish such as is used by engravers.

Weighed portions of the asphaltum were taken for analysis, and, on being heated in a covered crucible, so as to expel all the volatile matter, the coke remained, and was weighed. The results of two trials gave—

1st.	2d.
58.5 of volatile matter.	58.8 of volatile matter.
41.5 of coke.	41.2 of coke.
100.0	100.0

The coke obtained was burnt on a platinum tray placed in a red hot muffle, and left 0.47 per cent. of ashes of a deep red brown color, consisting of peroxide of iron, with a little oxide of manganese and silica and alumina.

The discovery of this valuable fuel so near to our borders is a matter of congratulation. The bed is stated to be from four to six feet in thickness, and if it holds out for any considerable extent, it must supply an enormous amount of fuel. This substance is particularly valuable for the production of gas for illumination. It is also the best fuel for steam engines, and is particularly well adapted for the use of locomotive steam engines on railroads.

I have not visited the spot where this asphaltum is found; but having seen it associated with gypsum from Dorchester, N. B., am led to believe that it occurs above the coal formation of New Brunswick.

Dr. Durkee presented some specimens of *poly-siphonaria formosa* to be examined under the microscope.

Dr. C. T. Jackson exhibited to the society a number of curious artificial minerals which were found crystallized in the slags of an iron furnace in Pennsylvania, by Charles Jackson, Esq., of Boston. The forms of the crystals were rhombohedral hexahedral prisms, and right rhombic prisms. Some of them were transparent and colorless, resembling in appearance, chabatic. Others resembled phosphates of lime, and sulphate of barytes. These

minerals will be analysed by Dr. Jackson, who promised to make a future communication on the subject.

Mr. Alger presented specimens of *strontian* from Lockport, N.Y.; *dog tooth spar* or sulphate of barites, from Nova Scotia; and *cubic iron pyrites*, from Little Lehigh river, Penn.

PUBLIC DEBT OF OHIO.

We copy the following exhibit of the indebtedness of this State from the report of the canal fund commissioners, recently made to the legislature of that State.

From March 15, 1845, to Nov. 15, 1849, the receipts and expenditures of funds strictly applicable to repairs of public works and payment of interest upon the State debt, have been as follows:

Expenditures.	
Repairs and supt. of public works.	\$1,508,616 26 0
Balance due for construction of do.	157,991 32 0
Interest on public debt.	5,356,797 49 5
	\$7,023,405 07 5

Receipts.	
From public works, including balances.	\$3,516,717 24 5
From domestic stocks issued.	157,991 32 0
From general revenue or taxes.	3,327,943 79 4
Balance—being excess of expenditures.	20,752 71 6
	\$7,023,405 07 5

All other receipts and expenditures during the same period have been those appertaining to the fund for the redemption of the State debt, and have been as follows:

Receipts.	
From sale of school and canal lands.	\$310,442 34 7
From domestic stock issued.	72,425 44 0
From surplus revenue.	578,929 28 5
From sinking fund.	166,484 48 0
	\$1,128,281 55 2
Expenditures.	
The above excess.	\$20,752 71 6
Redemption of turnpike stock.	277,874 28 0
domestic stock.	455,110 58 0
Balance Nov. 15, 1849.	374,543 97 6
	\$1,128,281 55 2

The domestic debt redeemable at the pleasure of the State has been called in, and \$250,000 appropriated to its redemption. Of the above balance, \$301,054 98 has been appropriated to the redemption of the seven per cent. stock. Under the law of March 4, 1849, \$700,000 of the stock of 1850 have been already redeemed by the issue of stock of a later period, at a premium of from 5 to 8 per cent. for the stock issued; realising a profit to the State of \$41,000. The indebtedness of the State is thus exhibited in the report:

Of the reimbursable debt of the State, \$16,880,992 50 is payable at New York. The interest of 5 and 6 per cent. stocks is payable semi-annually on the first days of January and July. The interest of the 7 per cent. stock is payable on the first days of May and November. This portion of the public debt is funded in the following stocks:

Five per cents. redeemable at the pleasure of the State after 1850.	\$100,000 00
Six per cents. redeemable at the pleasure of the State after 1850.	3,285,658 76
Seven per cents. redeemable at the pleasure of the State after 1851.	1,468,200 00
Five per cents. redeemable at the pleasure of the State after 1855.	150,000 00
Six per cents. redeemable at the pleasure of the State after 1856.	3,365,779 24
Six per cents. redeemable at the pleasure of the State after 1860.	6,812,481 00
Six per cents. redeemable at the pleasure of the State after 1870.	1,367,063 50

Total amount of foreign debt. \$16,849,182 50
Of which about one-third is held in foreign countries, principally in Europe. The balance is

held by American citizens. The Domestic Debt of the State, of which the principal and interest are payable at the State Treasury, the interest on the first days of May and November, is funded on the following Stocks:

Six per cents. National Road Stock, redeemed at the pleasure of the State.	\$66,325 38
Six per cents. received for Canal, School, and Ministerial lands redeemable at the pleasure of the State after 1852.	\$6,491 32
Six per cents. receivable for Miami Extension Canal Land and redeemable at the pleasure of the State after 1863.	74,185 00
Six per cents. issued upon the faith and credit of the State, and redeemable at its pleasure after 1863.	224,500 00

Total amount of Domestic Debt. \$451,501 70
Total reimbursable debt of the State. \$17,300,684 20
Of reducing from this sum the seven per cent. loan for which the Surplus Revenue is especially pledged, the amount of the debt to be paid by the ordinary revenues of the State is \$15,832,484 20
By the law of February 24, 1848, becoming operative during the present year, a sum commencing with 100,000 dollars and increasing annually in the ratio of a 6 per cent. compound interest, is to be annually appropriated from the general revenue to the redemption of our State Stocks.

This sum with other revenues applicable to the same object derived from the sale of lands, &c., and which may be safely estimated at \$50,000 annually, will create a sinking fund which will accumulate and reduce the State debt at the following rate:

In 1855 amount of sinking fund \$1,046,296, reducing debt to.	\$14,782,274
In 1860 amount of sinking fund \$930,882 reducing debt to.	\$13,851,452
In 1865 amount of sinking fund \$1,514,277, reducing debt to.	\$12,337,175
In 1870 amount of sinking fund \$2,026,443, reducing debt to.	\$40,310,732
In 1875 amount of sinking fund \$2,711,838, reducing debt to.	\$7,598,894
In 1880 amount of sinking fund \$3,629,041, reducing debt to.	\$4,969,843
In 1875 amount of sinking fund \$3,969,041, reducing debt to.	

The total amount of the property of the State entered for taxation, as appears in the Annual Report of the Auditor of State for the year 1849 is \$430,739,085 00. Being an increase in the value of personal property, new structures, &c., exclusive of the increased value of lands, over the amount for the year 1848 of \$9,671,094 00. An annual tax of one-fortieth of 1 per cent. upon this amount in addition to the amount heretofore accruing to the Canal Fund from taxes, will somewhat exceed the amount necessary to maintain the present policy of the State as above indicated, and will wholly redeem the State debt in thirty-five years.

The taxable property of the State is, however, increasing at a rate of not less than five per cent. per annum. This tax may therefore be reduced at the same rate, or if continued without reduction, the State debt will be cancelled at a still earlier date.

OUR COTTON MANUFACTURES—CHANGES IN PRICE.

Among the documents appended to the Report of the Secretary of the Treasury, are several tables, showing the prices of various kinds of cotton goods for a series of years. The results are quite curious. In almost every case the decline in price has been material.

Thus, in 1835, Lawrence company stout brown sheetings, 37 inches wide, sold for 12 cents per yard; in 1849, the same goods sold at 7 cents per yard. In 1835, Tremont company brown sheetings, 37 inches wide, sold at 10½ cents per yard; in 1849, at 6 cents. In 1835, Boot company stout brown drillings, 30 inches wide, sold at 14 cents per yard, and in 1849, at 7 cents. In 1835, Tremont company brown shirtings sold at 8 cents per yard, and in

1849 at 4 cents. The following statement of prices per yard, of printed calicoes, manufactured by the Merrimac Manufacturing company, also exhibits very material changes:

1836.....	17-83	1843.....	10-56
1837.....	17	1844.....	11-60
1838.....	14-39	1845.....	11-50
1839.....	15-98	1846.....	10-82
1840.....	13-78	1847.....	11-05
1841.....	13-25	1848.....	9-89
1842.....	11-91	1849.....	9-28

We subjoin a statement of prices of fine and superfine carpetings for 20 years, from 1830 to 1849, inclusive, manufactured by the Lowell Manufacturing company at Lowell, furnished by A. & A. Lawrence & Co., Agents, Boston, November, 1849.

Carpetings.		Carpetings.	
Superfine Fine	Superfine Fine	Superfine Fine	Superfine Fine
p. yrd.	p. yrd.	p. yrd.	p. yrd.
1830.....	\$1.00 85	1840.....	97½ 80
1831.....	1.15 100	1841.....	90 80
1832.....	1.05 90	1842.....	80 65
1833.....	1.05 90	1843.....	70 62½
1834.....	1.19 95	1844.....	80 67½
1835.....	1.10 95	1845.....	80 65
1836.....	1.15 100	1846.....	77½ 65
1837.....	1.12½ 97½	1847.....	77½ 65
1838.....	1.05 90	1848.....	77½ 65
1839.....	1.07½ 92½	1849.....	70 60

[Phil. Inq.]

THE NICARAGUA TREATY AND CANAL.

The negotiation of the treaty between the United States and Great Britain now before the Senate for approval, marks an era in the progress of mankind. We shall hail its ratification (which we are sure is not doubtful and we trust cannot be distant) as a triumph of civilization—a victory over barbarism and night. The spectacle of the two Anglo Saxon nations, of the old and the new world respectively, uniting their councils and their efforts to secure the opening of a new and most advantageous highway to the commerce of the world—each expressly and carefully stipulating that the advantages thereby acquired are not for themselves only but for all mankind—such is the spectacle of which the contracting parties may justly be proud, and which will reflect honor on the nineteenth century.

The material provisions of the treaty are substantially as follows:

1. The United States and Great Britain mutually and reciprocally pledge their faith to either, that they will not take, use, hold, occupy nor exercise dominion over any part of Central America henceforth and forever.

2. They further agree not to establish or maintain any fortifications or military posts upon or within said country.

3. Each government pledges itself to respect, and to use its best offices to cause to be respected by other nations, the complete and perpetual neutrality of the ports on the Atlantic and Pacific oceans which shall be the termini respectively of the proposed ship canal through Central America.

4. They will also respect, and use their best offices to cause to be respected by others, the perpetual neutrality of said ship canal, the vessels navigating it, and everything pertaining thereto.

5. They further agree to respect the neutrality of all vessels within a reasonable distance of either terminus of said canal [no distance yet agreed on, but two degrees or 120 geographical miles have been suggested and met with no objection] and to endeavor to procure a general recognition of such neutrality by all nations whatsoever.

6. They mutually agree to protect and secure the operations of such company as, under the authority of the State of Nicaragua, shall construct and maintain the proposed ship canal.

7. If the company now holding a contract with the State of Nicaragua for the construction of the ship canal uniting the two oceans shall within 12 months, demonstrate to the satisfaction of the two governments its ability to construct said canal, the foregoing stipulations shall enure to its benefit;—but if not, then any other company, duly authorized by Nicaragua, and which can satisfy the two governments of its ability to make the canal, shall enjoy all the benefits which this treaty is intended to guarantee to the constructors of the canal.

8. The contracting parties reciprocally pledge themselves to use their good offices respectively with the several State governments of Central America to induce them to enter into stipulations based upon and according with the foregoing.

9. Each party pledges to the other that it will interpose its good offices for the amicable settlement of any disputes which may arise respecting the construction of the ship canal or its management thereafter.

10. The two governments are not to interfere with the construction or management of the canal, except that either government, should tolls be levied on vessels passing through it, which in its view are exorbitant and oppressive, reserves the right of withdrawing from the company all the protection and favor which this treaty pledges it to afford;—but this will not affect the international stipulations of the treaty.

11. By a protocol to the treaty, the two nations covenant with each other not to claim or exercise, under the cover of a protectorate or of allegiance with any Central American State or tribe, any power which they have disclaimed or renounced in the foregoing articles.

LEATHER BUSINESS OF SALEM, MASS.

A table which we have been able to make, by the assistance of several gentlemen engaged in the business, shows the number of establishments to be as follows: tanners' 34; curriers' 34; tanners and curriers 15; leather and Morocco dressers and colorers' 2; total 85. The men employed in these establishments number 550. The number of vats used for tanning is 4,051.

The value of leather tanned and curried the last year is estimated at \$869,047 70.

The wages of the men employed will probably average 7 shillings per day, which gives an amount paid for labor annually of \$210,600.

It is reckoned that during the past year 12,000 cords of bark have been used, nearly all of which was brought by water from the eastward.

About 500 cords have come from the interior of New Hampshire over the inland railroads connecting with the Essex road. If we calculate the cost of bark at \$7 a cord it will give the large expense for bark of \$34,000.

The number of hides used may be set at 200,000, which, at a valuation of \$2 a hide would give \$400,000.

These facts give some idea of the great extent of the leather business in Salem.

We will now connect the statistics of the business in Salem and South Danvers, employing the statements of our Danvers correspondent:

SALEM.

Tanners, Curriers, and Morocco Dressers.

No. of men employed.....	550
" vats used for tanning.....	4,051
" Hides tanned.....	200,000
" Cords of bark used.....	12,000

SOUTH DANVERS.

Tanners, Curriers, and Morocco Dressers.

No. of men employed.....	365
" vats used for tanning.....	3,840
" Hides tanned.....	147,788
" Cords of bark used.....	9,300

TOTAL IN SALEM AND DANVERS.

No. of men employed.....	915
" vats occupied.....	7,891
" Hides turned.....	347,788
" Cords of bark used.....	21,300

[Essex Co. Freeman.]

RAILROAD LIABILITY.

A case of some importance in regard to the liability of railroad companies for baggage, recently decided in the Circuit Court at Troy, is thus stated in the N. Y. Courier:

Margaret Hart bought at Whitehall tickets thro' to Troy, over the Whitehall and Saratoga road and the Rensselaer and Saratoga road. She delivered her baggage into the agent's hands, and on reaching Troy most of it was missing. She sued the Rensselaer and Saratoga company for damages to the amount of \$396 with interest. The defence urged that the two roads had no connection with

each other, that there was no evidence that the baggage had ever been transferred from one to the other, and that the road which had received the baggage should be responsible for it, if either.

Judge Parker charged that the company was responsible for the delivery of the baggage at the end of the whole route for which they had sold tickets, and that they were also responsible for the acts of their agents. Part of the property lost consisted of sovereigns. It was claimed that the complainant was not entitled to recover for the loss of the sovereigns, on the ground that the company had advertised they would not be responsible for money of passengers, and had forbid their agents to accept the charge of any. The Court charged that such advertisement does not relieve the company so long as they do receive the money. The rule is, that if a traveller travels with a large amount of money, and gives no notice of the fact to the agents of the road that they might take additional care for its security, then the company is not liable; but if from any act on the part of common carriers, passengers lose amounts of money which may be considered but sufficient to defray ordinary travelling expenses, then they were liable for the amount lost and for any inconvenience passengers may suffer in consequence.

The Jury after a short absence, returned a verdict of \$410 for the plaintiff.

Important to Persons Using Patented Machines.

The Washington Union states that on Friday the U. S. Supreme Court, in the case of Wilson, assignee of Woodworth vs. Forsyth & Simpson, decided that a person in the lawful possession and use of a patented machine, when a patent is renewed or extended, is not merely entitled to the continued use of the thing patented, according to his interest therein, by virtue of the 18th sec. of the act of July, 1836, as decided in Wilson vs. Rousseau, and in this case when formerly before the court, in 1846, but has also the right to keep the machine in perfect repair, not, however, to the extent of destroying its identity, and supplying new cutters and knives to Woodworth's planing machine, when the old ones had become worn out, are lawful repairs, which may be made without infringing the patentee's extended right. The court also decided that the allegation of fraud against Uri Emmons, in obtaining an interest in the Woodworth patent in 1829, (F. & S. claiming in part under Emmons,) was not maintained in this case. The court affirmed the decree of the circuit court of the United States for Louisiana, dismissing complainant's (Wilson) bill—Judge Wayne delivering the opinion. The case was argued by Mr. Webster and Governor Seward for complainant, and Mr. H. D. Gilpin and J. D. Westcott for defendants.

Lehigh Canal Trade.

The following is the quantity of coal which passed the weigh lock at Mauch Chunk for the present year up to April 20th:

FROM		tons	
Mauch Chunk			ct.
Summit Mine.....		20,639	14
Room Run.....		7,264	04
Lehigh C. & N. Co.....		27,903	18
Beaver M. Mine.....		1,831	18
Spring Mnt. Coal.....		2,256	05
Penn. Haven			
Hazleton Coal Co.....		3,585	11
Cranberry Coal.....		2,630	04
Sugar Loaf Coal.....		0,000	00
Rock Port.			
Buck Mount'n Co.....		10,755	06
White Haven.			
Wilkesbarre Co.....		605	16
Total.....		49,568	18

The Summit Mines are worked by the following contractors:—Belford, Sharpe & Co., Daniel Bertsch, J. N. McClean, James Andreas and Peckens and Steel, who deliver the coal in cars at stated points to the Lehigh Coal and Navigation Company.

The Room Run Mine is rented on a coal lease by Messrs. Packer & Douglas.

The Beaver Meadow Mine is worked by Messrs. Hamburger & Co. and Cool and Lockhart, Con-

tractors. The coal is transported by Messrs. Milnes & Co. and delivered in the cars at Mauch Chunk to Messrs. Roberts, Cutter & McClintock, the purchasers.

The Spring Mountain Mine is worked by Messrs. Milnes & Co. lessees.

The Hazleton Mine is worked by A. Pardee & Co., on a coal lease.

The Cranberry Sugarloaf Mines, are worked by A. Pardee & Co., lessees.

The Buck Mountain Mine is worked by Mr. Thomas Brodrick, who delivers the coal in boats at Rock Port, for the Buck Mountain Coal Company.

The Wyoming Coal which passes over the Lehigh and Susquehanna Railroad, and enters the Lehigh Navigation at White Haven, is mined by the Wilkesbarre Coal company.

Maine.

Kennebec and Portland Railroad.—The City of Augusta has, by a vote of 398 to 195, determined to apply to the legislature for authority to loan and credit to the above road to the amount of \$200,000. The Cities of Bath and Gardiner are about calling meetings for a similar purpose. We presume that these applications will be readily granted, and if so, this road will be completed at an early day.

The following is the exhibit of the present financial condition of this work:

Amount received for original stock.....	\$540,220
" " preferred ".....	185,235
Debts against the company for—	
R. Williams and G. F. Patton's notes, due Nov. 7, 1850.....	108,800
Bonds of 1st Sept., 1848, payable Sept. 1, 1852.....	85,809
Notes and acceptances payable soon.....	70,512
Iron received.....	130,000
Trustees Yarmouth and Portland road....	9,653
R. Williams, account.....	11,272
G. F. and J. Patton, do.....	4,171
	\$1,145,672

Required to finish the road to Augusta—

Balance of grading and masonry, as per estimate of Green.....	\$215,477
More rails to finish the track.....	110,000
Bridges \$10,000, fencing \$10,000, and land damage \$50,000.....	70,000
Balance timber, and laying the track....	70,000
3 engines \$22,000, 5 cars \$10,000, gravel and freight cars \$8,000.....	40,000

Whole road will cost about.....	\$505,477
Received for original stock.....	\$540,220
And of \$160,000 still due from original subscribers it is believed will be realised	100,000
Portsmouth, Saco and Portland railroad are to take.....	100,000
In settlement with contractors will turn about.....	60,000
	\$300,220

To finish the road, pay the debts, and extinguish the preferred stock, requires \$800,000. This sum it is proposed to raise on the credit of the towns interested in the road.

PURIFICATION OF WATER.

It is now generally acknowledged that not the least amongst sanitary arrangements stands the supply of good water; but up to the present time, little or nothing has been done to ensure that good or pure water only shall be imbibed by the inhabitants of our cities and towns. It is true that such things as filters exist, but these are, in nine cases out of ten, little better than a delusion, as they will only effect the mechanical process of straining off the solid impurities contained in the liquid, leaving untouched the impurities with which the water is chemically impregnated, and which can only be removed by chemical means. It is known that all water, except distilled water, is more or less charged with various adventitious, earthy, saline, and gaseous matter acquired by transit through the

soil, etc. As regards the grosser impurities subsiding generally removes them, but the calcareous and earthy compounds still remain, which have to be got rid of before the water is rendered fit for drinking. Mr. Horsley, chemist, of Ryde, in the Isle of Wight, has recently patented a plan for purifying water, which his specification, just enrolled, states, is based on the application and extension of the use of such chemical materials as have been hitherto used to test the presence or absence of the impurities of water by forming insoluble precipitates, and thus he extends and applies to the purification and separation of such earthy and saline adventitious matter from the water in which the same is contained, such purification and separation to be conducted upon the principle of either single or double elective chemical affinity, commonly known to chemists; or in other words, by a system of displacement based on the nature and theory of chemical equivalents, or the knowledge of the parts and proportion in which these several substances unite and become held in solution.

PUBLIC DEBT OF THE UNITED STATES IN 1849.

The following summary statement of the public debt of the United States at the close of the year 1849, is derived from the last annual report of the Secretary of the Treasury:—

The public debt now amounts to the sum of \$64,704,693 71, which will be redeemable as follows:—	
Part of the old funded and unfunded debt on presentation.....	\$142,735 10
Debts of the district cities assumed by Congress, \$60,000 payable annually.....	960,000 00
Five per cent. stock, per act of August, 1846, redeemable 9th August, 1851.....	303,573 92
Five per cent. loan of 3d March, 1843, redeemable 1st July, 1853.....	6,468,231 36
Six per cent. loan of 22d July, 1846, redeemable 12th November, 1856.....	4,999,149 45
Six per cent. loan of 15th April, 1842, redeemable 31st December, 1862.....	8,198,686 03
Six per cent. loan of 28th January, 1847, redeemable 1st January, 1868.....	27,618,350 55
Six per cent. loan of 28th January, 1847, redeemable 1st January, 1868.....	149,828 00
Six per cent. loan of 31st March, 1848, redeemable 1st July, 1868.....	15,740,000 00
Treasury notes issued prior to 1846, payable on presentation; if converted into stock, under the act of January, 1847, will be redeemable 1st July, 1868.....	144,139 31
Total.....	\$64,704,693 71

The following statement exhibits the total amt. of specie in the cities of London, New York, Boston, Baltimore and New Orleans, in 1849 and 1850. The amounts at Boston and New York include those in the government, as well as the bank vaults. In London the market is larger than ever before—being within a fraction of £17,000,000 sterling, with exchanges still in favor of England, and interest at a very low rate. The direct effect of this continued abundance of money has been, not only low interest, but a marked rise in almost all descriptions of produce in Great Britain; and, as a consequence of this season of the year, exchanges are in favor of the United States.

	1849.	1850.	Increase.
London.....	\$72,617,950	84,817,050	12,199,100
New York.....	7,213,000	10,565,000	3,352,000
Boston.....	2,652,945	3,797,213	844,268
Baltimore....	1,781,911	2,113,758	331,847
New Orleans..	6,192,376	7,590,605	1,398,229
Total.....	\$90,758,182	108,883,626	18,125,444

The above is gathered from the intelligent commercial correspondent of the Washington Union, who also gives the annexed statement of the value

of produce which came to tide water on the Hudson, via the New York canals, as compared with that which arrived at New Orleans, via the Mississippi, as follows:

	1846.	1847.
Hudson.....	\$31,105,256	73,092,314
New Orleans.....	77,193,464	90,633,256
Total.....	\$128,298,720	162,125,670
	1848.	1849.
Hudson.....	\$50,883,907	51,845,219
New Orleans.....	79,779,151	81,989,692
Total.....	\$130,663,058	133,734,911

NEW YORK AND ERIE RAILROAD.

The receipts of this road for the month of April past have been as follows:

From passengers and mail.....	\$69,228 86
From Freight.....	72,756 03

Total.....	\$141,984 89
The receipts of April, 1849, were.....	62,123 24

Increase, (equal to 129 p. ct.).... \$79,861 65
The aggregate receipts of the four months of this year have been as annexed:

Earnings of the Erie Railroad, 1850.			
	Pass. & mail.	Freight.	Total.
January.....	46,752	66,222	112,974
February.....	46,471	55,741	102,212
March.....	55,349	75,229	130,578
April.....	69,229	72,756	141,985

Aggregate receipts.....\$487,749
The estimated receipts in the circular of the directors for the past month were \$150,000.

New York.

At a meeting of the directors of the Plattsburgh and Montreal railroad held at Fouquet's Hotel, in the village of Pattsburgh, on the 5th inst., the following officers were elected:—Amasa C. Moore, Pres't., Gustavus V. Edwards, Treas., and John J. Haile, Secretary.

Albany, Bennington, and Rutland Railroad Company.—This Company is now fully organised under the new general railroad law, and the articles of organization filed in the office of the Secretary of State.

At the first meeting of the stockholders, held this day, the following gentlemen were elected directors:—

Erastus Corning, James Edwards, Wm. W. Forsyth, John Taylor Cooper, Marcus T. Reynolds, Samuel Pruyn, James A. Wilson, John B. James, Franklin Townsend, Charles Van Benthuyzen, W. V. Many, John L. Schoolcraft, James Kidd.

Alabama.

Mobile and Girard Railroad.—The following gentlemen have been elected directors of this road for the present year:

Gen. A. Abercrombie, Capt. James Abercrombie, of Alabama; John Egerton, N. Orleans, Wm. A. Hardaway, Mobile; Robert H. Hardaway, Columbus.

R. H. Hardaway, Esq., was elected President of the board.

Alabama and Tennessee Railroad.—We find in the Alabama papers a circular addressed by J. W. Lapsley, Esq., President of the company, to the people of that portion of the State interested in the above road, urging the necessity of a vigorous and united effort in this great work. The President states that over \$1,000,000 of the stock has already been subscribed, and the engineer of the company, Lewis Troost, Esq., with an efficient corps of engineers, is now actively engaged in the location of the line.

We have always regarded the above as a very important work to the interests of the whole country, and have devoted a large space to it in our paper. It opens to the Gulf an outlet for the coal fields of Alabama, so important to the commerce of that section. It will stimulate the working of the abundant iron ores of that State, which are now to a great extent untouched. It will give to the planter a ready market for his products, at his door at all seasons of the year. At the present time the planter can only forward his products when the rivers are navigable. The whole produce of the south is thus thrown upon the market at the same time; and the large accumulation at particular seasons of the year have a direct tendency to depress prices. By means of a railroad, the planter can forward so as to meet the demand, and not subject himself to the expense of storing at the point of shipment. At the present time he is at the mercy of the purchasers. A railroad will reverse this evil, and place her in an independent position.

This road when completed will connect the railroads in the north with the Gulf, and must ever be one of the great routes by which the topical products of the south are to be exchanged for the products of the north. Its direction coincides with the natural course of trade in this country, which is an important item in railroad construction. We hope to witness a vigorous and successful prosecution of this work.

Ohio.

Cleveland and Pittsburgh Railroad.—The Portage Whig states that the Legislature of Pennsylvania has passed a bill granting to the Cleveland and Pittsburgh railroad company the power to run their road through that portion of Pennsylvania necessary to reach Pittsburgh, and the bill has been approved and delivered to the proper persons. The Whig says this fact will create new interest in the road, and the necessary arrangements to run the road into Pittsburgh will be pushed with all the speed possible. Along the whole extent of the line from Cleveland to Wellsville the work is being done with the greatest rapidity. The contractors will commence putting on the superstructure from this point north and south very soon; and without doubt the iron horse will be playing the first seventy miles south from Cleveland by the first of November, 1850, and the balance of the road to Wellsville by July, 1851. This connection will form the only remaining link to the great chain of railroads from the Atlantic to the great west. The officers and board of directors of the company deserve the greatest credit for their untiring exertions to effect the completion of this great enterprise.

Pennsylvania.

The *Chambersburg Register* says, that the work of relaying the rails on the Chambersburg and Carlisle Railroad is rapidly progressing; and it is believed that in the course of three months the whole distance between Harrisburg and Chambersburg will be accomplished.

THE MUSCOGEE RAILROAD.—We learn that some twenty-nine miles of the Muscogee Railroad starting from Columbus are already graded, and three parties are now upon the line pushing forward the work with rapidity. The contract with Messrs. Gray & Co. requires that 39 miles of the road shall be completed by the 1st of January next. We also learn that the President of this road; Major Howard has succeeded in negotiating in Savannah \$75,000 of Bonds belonging to it, and ordered 1,600

tons of iron from England to be delivered at Apalachicola, by the 1st of November.

AMERICAN RAILROAD JOURNAL.

Saturday, May 4, 1850.

In this country the necessity for railroads is felt to be the greatest, where accumulated capital is least abundant—in the west—where, from the nature of the soil, a good ordinary road is almost impossible, and where the surplus products of the country are of a bulky character and must be transported a great distance for a market. People inhabiting this section feel the need of, and commence the construction of railroads, before they have acquired sufficient capital to complete such works without embarrassment to themselves. The materials for their roads, which they cannot produce among themselves, they must buy on credit; and for the purpose of offering this credit in the safest and most acceptable form, communities engaged in these works offer their aggregate ability, represented by counties and towns, as security for the loans they seek.

Now this course is the most equitable, and the most effectual, for raising means for these works. A railroad is a public work, and each person is benefitted very nearly in the ratio to the amount of property he possesses. It is but just that he should be taxed for an object in proportion as he is benefitted by it. The security of a city or a town where the debt bears but a trifling proportion to their valuation, is the most perfect, more so than a State; for in the former case the property of every individual is holden for the debt, and may be taken in satisfaction of it. Contracts made by municipal corporations can be enforced in the laws of the State where they are situated, or in the courts of the United States; but in case of the refusal of a State to pay its liabilities, there exists no authority whatever even to bring the delinquent to justice; and we have in this country striking examples, that the *code of honor* is ineffectual to secure payment.

Bonds of counties and towns are much better security than bonds of railroad companies. A railroad may fail from want of sufficient business, or from being improperly constructed or managed. Its success must depend upon a few persons entrusted with its management, and these persons may be incompetent or corrupt. The world is full of instances of failure from all these causes; but a country with us, may be said never to grow poorer, nor is its aggregate of intelligence or honesty ever growing less. By no contingency, therefore, which may lessen the value of other securities, can those of towns or counties be effected. They are the best security that can be offered, as they can be enforced like any other; and the progress of our country in wealth and in intelligence, furnishes an absolute guarantee for its permanency. A very little reflection will convince any one of the truth of the above statements. We do not offer them as presenting anything new, but for the purpose of calling particular attention to these securities, and for the purpose of aiding, as far as is in our power, those companies which are to use them in completing their works. A very large amount of them will soon make their appearance in the eastern markets, in purchase of iron, engines, cars, etc., and ought, as far as inherent value is concerned, to command as high a price in the market as the bonds of the cities of New York and Boston.

It may not be here inappropriate to state that there is every probability that roads constructed in the west will prove more profitable as investments for capital than those in the eastern States. They do not cost half as much. They will be better managed, and will have a much larger business in proportion to their cost. Compare the west with the east. Look at the inexhaustible fertility of the former, capable of sustaining thrice the population of the Atlantic States, and who can doubt but that railroads there will have a business proportioned to the superiority of their resources. Railroads, too, in the west, are looked upon as a public blessing; every person feels that by promoting them he can gain more than by opposing them. Every man is willing to make a sacrifice to aid them.—As a general thing the right of way is a gratuity; so are sufficient lands for stations and depots.—Every thing is at the lowest possible rate for the purpose of aiding the work. Directors cannot help being influenced to some extent by the general sentiment of the community; and when all are actuated by these considerations, there can be but little bad or dishonest management. But how is it in the eastern States? Our large cities here are swarming with men who have no interest in a public work, and who expect no benefit from its construction. Such men look upon all such enterprises as a proper object upon which to exercise their tactics. If they cannot make money by getting control over it, they seek to accomplish the same end by attacking and opposing its progress, and like the African corsair their refraining from piratical attacks, must be purchased by a tribute. It often happens, therefore, that while one class are busily engaged in promoting some work of general usefulness, an equal number, and hardly less influential, are actually engaged in thwarting their efforts. In these contests the attacking party is not unfrequently the successful one, or if it is in the end defeated, it often succeeds in so damaging the character and usefulness of the work as to leave to the other party but a barren victory. From such enemies the public works of the west are in a measure free, and will continue so till the progress of wealth and civilization shall there produce its legitimate results.

The enormous losses in railroad investments in England, was owing to the fact that most of the money expended in their construction went into the hands of stock jobbers—men who felt no interest in the success of the roads as public works. Their interest consisted in getting all the money they could into their own hands, and holding on to it.—Similar causes have had some influence in depreciating the value of railroad property in Massachusetts; but in the west, directors, as a general rule, are more benefitted by the success of the work they have in charge, than by any incidental advantage they can reap from their connection with it. So long as such interests are paramount, we have the best pledge possible for the good conduct of a director; and we lose this security when other interests outweigh this.

Ohio.

Cincinnati, Hamilton and Dayton Rail Road.

We learn that the work has been recommenced on the portion of this road where it was discontinued some time since, in consequence of the exorbitant damages claimed by the land holders along the line. We believe that a new line for a part of the distance has been adopted, and that no obstacle now exists to a vigorous prosecution of the work.

New York and Erie Road.

The steady rise in the market value of this stock must be a source of gratification to all who desire the prosperity of this city, and the whole country; (for this road is to be to a large extent national in its benefits;) and who have sufficient humanity left to wish to see those engaged in a laudable enterprise properly rewarded. Within a year this stock has risen from \$60 to \$73 per share, with every indication of a steady advance. Thus far the fountain head has not been touched. The stream of business is as yet only made up of a few rivulets on the line of the road; but when the great lakes are reached, which receive on their bosom the immense trade of the west, and when the various lines of railroad now in progress from its western terminus to the Mississippi river shall be completed, the stream of trade and travel which will then flow over this road will bear no proportion whatever to its present volume. The success of this road is now demonstrated; and it can never again be injuriously affected by combinations of corrupt men, or the attacks of a venal press. The real capacity for business it has shown, will render the completion of the work an easy and pleasant task.

New Jersey.

At the annual meeting of the stockholders of the Camden and Amboy railroad company at Bordentown yesterday, the following named directors were re-elected, viz: Robert L. Stevens, John W. Mickle, Edwin A. Stevens, Benj. Fish, John L. McKnight, Richard S. Field, and J. Swift Livingston. Robert L. Stevens was elected President and Superintendent of the road; James S. Green, Treasurer; William H. Thompson, Secretary. A resolution was adopted by the stockholders, we understand, setting forth that the recent public investigation has corroborated their conviction of the fidelity of the officers of the company.

Virginia.

Orange and Alexandria Railroad.—The contract for sixty miles of the Alexandria and Gordonsville railroad has been awarded to Eggleston, Dickey, Matthews, and McDonald—"From near Alexandria to Culpepper court house, 60 miles to be completed by 1st January, 1853." The contractors are from Albany, N. Y.

Connecticut.

New Haven and New London Railroad.—The following gentlemen are directors:—Frederick R. Griffin, of Guilford; John Griswold, of N. York; William P. Burrall, of Bridgeport; Charles J. M'Curdy, of Lyme; Henry Hotchkins, of New Haven; Elias Perkins, of New London; Joel Tuttle, of Guilford; Ely A. Elliott, of Clinton; Ralph D. Smith of Guilford. F. R. Griffin, Esq., has been chosen Pres't. of the company.

COLONEL BENTON'S PROJECT FOR A PACIFIC RAILROAD.

The Baltimore Sun gives an outline of Colonel Benton's bill for a railroad from St. Louis to San Francisco, with branch roads to New Mexico, Oregon and Salt Lake. It sets apart the proceeds of the sales of the public lands for the breadth of one mile, to be appropriated to the road, and 1,000 feet to branch roads on each line, to be constructed.—A railroad, common road and lines of telegraph. Common road to be free of toll, and railroads to be taxed sufficient to keep them in repair. Indian titles to be extinguished on the route to the breadth of 100 miles. Military stations to be established. Every male settler over 18 that settles on line of

road or branches within one year after extinguishment of Indian titles to receive 100 acres. Those that settle afterwards, pre-emption right to same extent. Surveys of best routes to be made. Common road to be completed in one year, and central in seven years, after being located. Use of railway granted to individuals or companies for a limited time, who shall contract to transport mails, munitions of war, all public and private freights at reasonable rates.

IMPROVEMENT IN LOCOMOTIVE ENGINES AND RAILROADS.

The very injurious effect of running engines at high speed, both upon the road and the machine itself, has turned very general attention to the devising of some mode by which this great evil can be obviated. Among the most prominent of the remedies are those proposed by Mr. Sellers of Cincinnati and Mr. French of Virginia. The following copied from the pamphlet published by Mr. Sellers, gives a good idea of the plan proposed by him.

The only objection to the use of the wood, in place of iron for railroads, is the great wear caused by the locomotive, which must on the whole be made of sufficient weight to produce the requisite tractive power by adhesion to the rails; the effect of which, is not only that of a downward pressure, as is the case with the cars, but at the same time the whole weight of the train is moved by the adhesion of the locomotive wheels to the rails; in consequence of which the wood springs and gives way under the great weight, and being at the same time subjected to the friction of traction, the fibres are separated and it rapidly splits into shreds, and in a little time is rendered utterly useless. Yet where wooden rails have been used on grades where the cars descend by their own gravity, or where horsepower has been applied, they have been found, in many cases, even more durable than where plated with iron—there are rails made of Beach and Maple—that have been in constant use above 5 years, and show but little signs of wear—in fact they have become hard and polished on the surface.

"The object of the Pioneer system is to adopt Railroads in such a manner that locomotives can be used without injury to the rails. To accomplish this, the engines, cars and rails, must be proportioned to the work they have to perform. The diameter of the car wheels and bearing surface on the rails, must be increased to such size as to roll over the wood without indenting it—the less of the motion and slight vibration caused to the machinery in running on wood, will admit of a great reduction in the weight of the cars and yet be of adequate strength. The engines on the old system could not be reduced in weight and yet retain their tractive force. To accomplish this, the third rail is used to draw by, and also as a guide rail, so as to dispense with the flanges on the cars and also locomotive wheels, the engine and cars being guided by wheels which press against the sides of the centre rail, offering a much greater security against running off the track, than flanges on the wheels possibly can; and preventing the great injury that flanges would cause to the edges of the wooden rails. The centre rail takes on its upper surface, part of the weight of the engine, and the cars also, if desirable.

"The sides of the centre rail are used for the locomotive to exert its tractive force on, which it does by means of one or more pairs of horizontal driving wheels operating on the opposite sides of the rail: those wheels are kept in contact and pressed against the rails by means of a lever arrangement to which the trains are attached, in such a manner that an increased amount of load or increased resistance caused by the grade of the road, will operate on the wheels, and cause them to press against the sides of the rails with just the amount of pressure required to produce the adhesion necessary to do the work; thus avoiding the necessity of heavy locomotives for the purpose of producing adhesion; the adhesion being given by the load drawn, will always vary to suit the circum-

stances, and save all extra friction, and also that unproductive weight that is perpetually carried and re-carried over the roads on the present system. The arrangement of the adhesion wheels is such that precisely the same amount of pressure is applied to each of the opposite sides of the rails, so as to neutralize any spring that might otherwise occur: by this arrangement the great difficulty of using wood, for the purpose of traction is obviated, the wheels then have only to be proportioned in diameter and bearing surface to the work required, that is, so as not to actually indent themselves into the rail.

"The advantages resulting from the use of the centre rail, for wooden railroads is very obvious. In the first place the side rails are relieved from the wear caused by the traction of the locomotive; secondly, they are relieved from the grinding action of flanges upon their sides, besides a saving of ten per cent. in friction; thus by the use of light engines, of weight not exceeding that of the cars, the side rails will more durable than the plank road as now made. The central rail has very little weight to carry, and presents broad surfaces on which the adhesion wheels act, and is not so liable to injury from the traction of the locomotive as the rails are, as an examination of the matter will show clearly. In the place, the nature of adhesion is such, that a less amount of pressure upon the rail, is required to do the same work; and, secondly, the tractive power of the locomotive is exerted upon that part of the rail, upon which water will not lie, and consequently *brooming up* cannot take place to the extent that it does on the side rails when used for the purpose of traction. A division of labor, so to speak, is thus effected, the greater part of the weight being required of them: the central rail doing all the traction, and bearing but a comparatively small portion of the weight, thus adding greatly to the durability of the road, as far as wear is concerned."

The improvement proposed by Mr. French is based upon the same general principle. A practical test is soon to be made of this by the State of Virginia, an appropriation having been made by the legislature for this purpose.

We are yet in our infancy in the science of locomotion, and because a suggestion is new it is certainly very unwise to discard it on that account alone; but we cannot but feel that the change proposed is based upon a distinction without a difference. The heavy locomotive is sought to be got rid of from its crushing effect upon the rail. Now the improvement consists in simply changing the direction of this pressure from a vertical to a horizontal pressure. The pressure must be nearly the same under the new as under the old system, for pressure is necessary for adhesion, and the only difference in the weight of the trains will be in the locomotive. The cars to be used will be the same in either case. Now it strikes us that the abrading effects upon the rail will be much greater in the change proposed than in the old way, because the wheels acting against opposite sides of the rails will act upon an unelastic medium, which must soon destroy the iron. This is why stone sleepers cannot be used. They do not allow a sufficient yielding of the rail. The wheel strikes dead upon any inequality on the surface, and produces the same effect as a blow from a heavy hammer. A good road bed therefore is one that sustains the superstructure with uniformity, at the same time that it yields sufficiently to accommodate its inequalities to the action of the locomotive.

Again, the best economy in the end, is a level road. It costs less in the long run to avoid high grades by increase of line and by deep cuttings than to overcome them by the use of power. There is no way by which the wear and tear in steep grades can be avoided without getting rid of the law of gravity. If an engine could be constructed to surmount high grades, true economy would consist in

avoiding them if possible. Where they cannot be avoided, they must under all improvement constitute one of the strong arguments against the construction of a road.

But as we said in the outset, we are in the infancy of improvement, and experiments are equally valuable that teach the way not to go, as those that put us on the right course. We hope that both that of Mr. Seller's and Mr. French will receive a satisfactory trial, as in either case good cannot fail to come from the experiment.

J. T. Hodge

Will attend to the examination of mining tracts near Lake Superior, and prepare Reports and Maps.

Address, during the Summer,
Ontonagon Postoffice, Lake Superior.

To Contractors.

THE TROY AND RUTLAND RAILROAD Co. will receive PROPOSALS for constructing 17 miles of their road, from Salem to the Hoosack river, on the 16th of May next, and decide upon such proposals on the 20th day of May. The necessary information in relation thereto can be had on and after the 26th inst., by application to the undersigned at his office in Salem, Washington Co., N. Y.

C. L. PRESCOTT, Chief Engineer.
April 23d, 1850.

8,000 Tons Railroad Iron.

THE OHIO AND PENNSYLVANIA RAILROAD CO. wish to contract for eight thousand tons of Railroad Iron, for the eastern division of their road, extending westward from Pittsburgh. Three thousand tons to be delivered on the Ohio river at Pittsburgh and Beaver, before the close of canal navigation in the present year, 1850; and the remainder in the spring of next year. The rails are to be of the H pattern, in lengths of 20 feet, and are to weigh 60 lbs. per lineal yard. They are to be subject to the inspection of Solomon W. Roberts, Chief Engineer.—For further particulars address the President of the Company at Pittsburgh.

By order of the Board of Directors.
WM. ROBINSON, Jn., President.

Machinery Oil.

WE the undersigned are now manufacturing an oil intended for the use of Railroads, Steamers and Manufacturing establishments. It has been in use several months and has given very general satisfaction. Our price is uniformly 70 cts. per gallon. Enquiries or orders attended to promptly. Address

ROBBINS, LANGDON & CO.,
133 Water street, corner Pine, New York.

CERTIFICATES.

Bridgeport, Nov. 7th, 1849.

Messrs. Robbins, Langdon & Co.,
Gentlemen: After about three months' trial of your oil, I have come to the conclusion to use it entirely on the engines on the New York and New Haven and the New Haven and Northampton Railroads for the following reasons:

1. It wears quite as long as sperm oil.
2. So far as I have tried it, it keeps the Journals equally cool as sperm oil.
3. I have no complaint from our men about cleaning the engines, and presume it is equally as easy to clean an engine by using your oil as it is in using sperm oil.
4. I can see no reason why it is not equal to the best of sperm oil for lubricating machinery.
5. There is in my opinion a very great saving to all parties in using your oil for lubricating machinery.
6. I believe it will stand cold weather better than any sperm oil. Very respectfully yours,

R. B. MASON, Supt. N.Y. & N.H. Railway.

Providence, March 22d, 1850.

Messrs. Robbins, Langdon & Co.,
Gentlemen: We have given your machine oil a thorough trial, and find that it possesses all the qualities that we could wish. As it works better than any sperm oil we have ever used. Our shafts that required oiling four times a day with the best sperm oil that we could get, work equally as well by the application of your oil twice a day, and your oil stands cold weather much better than any oil we have ever used. Our engineer having had years' experience in running and making engines, we put great confidence in his judgment, and he gives it as his opinion that your oil is fully equal to if not better than any he ever used; and we shall soon give you an order for more, as we do not want any other kind of oil as long as we can get yours.

Very respectfully yours,
JACKSON, CLARK & CO.

Steamer Bay State, Oct. 22d, 1849.

Messrs. Robbins, Langdon & Co.,

Gentlemen: In answer to your request for my testimony as to the machinery oil manufactured by you, I will say that I have used it for some time past on the Bay State, and am perfectly satisfied that your statement to me of its good qualities, is correct. As far as its lasting properties go, it wears equally long as sperm oil, runs perfectly free, and has no appearance of thickening. As seeing is better than hearing, I would recommend you to send your friends on board our boat, and they can then, by ocular demonstration, judge for themselves. Yours respectfully, JOHN GRAY,
Engineer of Steamer Bay State, Pier 3, N.R.

Steamboat Knickerbocker, Sept. 22, 1849.

Gentlemen: Mr. Hall, Agent of the Norwich and New London Steamboat Co., placed in my hands some of your machinery oil, which he desired me to use on the engine and other machinery, which I have done, and was so much pleased with the working, that I recommended the owners to give you their orders.

I have been using the article since August 19, and with perfect satisfaction, and I am well satisfied that your oil is as good as the best of sperm for lubricating machinery. I am yours very respectfully,

SAMUEL CARTER,

Engineer of Steamboat Knickerbocker, Pier 18, N.R.
To Messrs. Robbins, Langdon & Co.,
Oil Merchants, 133 Water street, New York.

Steamboat Worcester, N. York, Oct. 15, 1849.

Messrs. Robbins, Langdon & Co.,

Gentlemen: I beg to acknowledge the receipt of your letter requesting my opinion as to your oil for machinery, which I had not time to reply to previous to my return to Norwich. I have been using your oil on the engine and machinery of the Worcester with perfect success, and have much pleasure in testifying as to its good qualities. In my opinion, the journals keep cooler with your oil than with sperm, and it wears equally well. Should you at any time wish to refer to me as to your oil, I beg you will do so without hesitation. Yours respectfully, JAS. CROOKER,
Engineer Steamboat Worcester, Pier 18, N. R.

New York, August 3d, 1849.

Messrs. Robbins, Langdon & Co.,

Gentlemen: I received your letter in regard to your oil for machinery, which I handed to our engineer, and have much pleasure in sending you an extract from his letter to me on the subject: "I have applied the oil sent me upon our hot journals and cylinders, and find that they keep cooler with it than with sperm oil. I cannot find any fault with the oil, although I have watched it carefully. I have also tried it against an equal quantity of sperm oil, and find it wears quite as well." You are quite at liberty to show this extract to your friends, and shall be happy to give any further certificate you may require. WM. RIDER,
Treasurer Union India-rubber Co., 19 Nassau st. N. Y.

New York, March 22d, 1850.

Messrs. Robbins, Langdon & Co.,

Gentlemen: I have been using your machinery oil on the engine and other machinery of the Steamer Southerner running from this to Charleston, and find it equal to sperm oil. I shall continue the use of the same, and you are at liberty to refer to me at any time. Yours respectfully, DAVID N. MAXON,
Chief Engineer Steamer Southerner.

Steamboat C. Vanderbilt, N. York, Oct. 11, 1849.

Messrs. Robbins, Langdon & Co.,

Gentlemen: In reply to your inquiries respecting the qualities of your machinery oil, I am happy to inform you that I have been using the article sent me for some time past, not only on the engine but on all other machinery connected with it: and from a careful and close examination, I am well satisfied that your oil is as good as the best of sperm oil for lubricating machinery. I have recommended Mr. Lockwood the agent of the company, to give you their orders. Yours respectfully, JAMES BAKER,
Engineer Steamboat C. Vanderbilt, Pier 3, N.R.

Brooklyn, August 29, 1849.

Messrs. Robbins, Langdon & Co.,

Gentlemen: Your letter of the 29th was received, and I am happy to inform you that I have used your machinery oil throughout my establishment, and I am still of the opinion that it is as good as the best of sperm oil for lubricating machinery. I should be pleased at any time to have your friends witness the working, and I am sure, after once doing so, will give you their orders. Please send me another cask by the evening of the 3d, and by so doing you will much oblige,

W. M. BURDON, Manufacturer of
Steam Engines and other Machinery, 102 Front st.

A young man of experience in Surveying wishes a situation on a Railroad as an Assistant. Please apply at this office.

Spikes, Spikes, Spikes.

ANY person wishing a simple and effective Spike Machine, or a number of them, may be supplied by addressing J. W. FLACK,
Troy, N. Y.
March 6, 1850.

Doremus & Nixon, IMPORTERS AND FURNISHERS

RAILROAD CAR AND COACH TRIMMINGS.

Plain Garnet Plush. Fig. Garnet Plush (Butterfly pat.
"Crimson" "Crimson" (Elegant.
"Scarlet" " " " (Gen. Taylor.

BROCATELLES.

Crimson Silk Brocatelles. Gold and Maroon do.
Gold and Blue " " Brown "
Silk and Wool " " of every color.

MOQUETTES,

Of elegant designs and colors.

GERMAN CLOTH FOR CAR LININGS.

The most beautiful goods ever shown in this country, and the subscribers are the sole agents for the sale of them.

Oil cloths Enamelled with Gold. These goods can be
"Silver" furnished in any
Do. Silver ground velvet printed. dimensions req'd.

CURLED HAIR

Of every description and quality.

JNO. W. A. STRICKLAND, Agent.
New York, 1850. 1yl6

Notice to Contractors.

CENTRAL OHIO RAILROAD.

THE Line of this road between Zanesville and Newark, a distance of about 26 miles, will be ready for examination about the 1st of May next, and Sealed Proposals for the Graduation, Masonry and Bridging of the said road will be received at the office of the company, in Zanesville, until the 20th of May next.

The graduation must be completed by the 1st day of January next—the masonry by the 1st day of June, 1851—and the superstructure of the bridges by the 1st day of July, 1851. The wood work of the bridges not to be commenced until the 1st of January next.

This work will embrace some heavy rock cutting; two bridges across the Pataskala or Licking river, and one across its north branch, also several important cuts and embankments.

The bids may be predicated either upon CASH payments entirely, or upon 75 per cent. cash, and 25 per cent. in the stock of the company.

To contractors at a distance, it may be as well to observe that this work is a part of the Great Central Line, projected as an extension of the Baltimore and Ohio Railroad, from the Ohio river to Central and Western Ohio and Indiana.

The company hope to have the line from Newark to Columbus, 34 miles, ready for examination by the 15th of June next, and for contract by the 1st of July next.

By order of the Board.
ROBERT MAC LEOD,
Engineer in Charge.

Zanesville, April 18, 1850.

Notice to Contractors.

Bellefontaine and Indiana Railroad.

SEALED PROPOSALS will be received at the Company's Office in Sidney, Shelby Co., Ohio, on and after Wednesday, May 5th, 1850, for doing the Grubbing, Clearing, Grading and Masonry, of such portions of the BELLEFONTAINE AND INDIANA Railroad, as can be prepared for letting by the 15th.

The line extends from some point on the Cleveland, Columbus and Cincinnati Railroad, through MARION, BELLEFONTAINE and SIDNEY, to the STATE LINE, between Ohio and Indiana, a total distance of about 120 miles.

It is expected that the line from the eastern terminus to Marion, about 22 miles, and from Bellefontaine to Sidney, about 23 miles, will then be ready to let; and the remainder of the route as soon thereafter as it can be located and prepared.

Specifications and plans will be ready for inspection and all necessary information may be obtained on application at the Office of the Chief Engineer, in Marion, or to J. Pemberton, Resident Engineer, in Sidney, after the 5th of May.

By order of the Board of Directors.
W. MILNOR ROBERTS, Chief Eng.
Engineer's Office, Marion, Ohio,
March 18, 1850. 15lf

Railroad Iron Wanted.

Virginia and Tennessee Railroad Office,
Lynchburg, Va., March 16, 1850.

PROPOSALS will be received at this Office until the 6th of May next, for the delivery in Lynchburg, of Iron Rails for the Virginia and Tennessee Railroad, to be manufactured in or near this town of Virginia Iron.

The said Iron to be made of the best pig metal, and to be delivered at the following times, and in the following quantities, viz: Six thousand tons in the year 1851, and the remainder (about 15,000 tons) for the whole road, equally, in the years 1852 and 1853.

Separate proposals will also be received for the delivery in Lynchburg, of pig metal, at times and in quantities sufficient for the manufacture of the rails above mentioned, said delivery to commence as early as the first of November, 1850.

The rails and the pig metal will be subjected to strict inspection; the rails are to weigh about 60 lbs. per yard.

At the same time, proposals will be received for the above quantity of Iron, manufactured any where else in America or in England, to be delivered in Lynchburg or Richmond, under the same general conditions as those prescribed for Virginia Iron, manufactured at Lynchburg. Satisfactory security will be required.

Proposals for delivering any portion of the above mentioned quantity, and at periods varying from those specified above, will be considered.

By order of the Board of Directors.

CHAS. F. M. GARNETT,
Chief Engineer.

15lf

To Contractors.

SEALED PROPOSALS will be received at the Office of the Nashville and Chattanooga Railroad Company in Chattanooga until the 20th day of May next, for the graduation and masonry of the Chattanooga Division of said Road—embracing a distance of 27 1/2 miles.

The graduation will be heavy for about 15 miles, (in crossing Raccoon Mountain, and passing around Lookout Mountain bluffs), the balance, average work. The masonry will consist chiefly of cut stone Piers for Tennessee River Bridge, (about 4,000 Perches), Piers for running Water Bridge, (about 2,000 Perches), and Pier for Lookout Creek Bridge, about 500 Perches.

Sealed proposals will also be received at the same time and place, for the graduation of 10 miles of the Eastern end of the Winchester Division—embracing some heavy work. Also the masonry of Elk River and Widow's Creek Bridges.

Plans and Profiles of the Work will be exhibited, specifications furnished, and all other desired information given, on application to Mr. James A. Corry, the Engineer in charge of the work, at the Company's Office in Chattanooga, from the 10th of May until the day of letting.

Before making bids the line should be thoroughly examined. The depths of the Cuts and Embankments can be ascertained from the centre stakes. The work to be commenced immediately after the letting. And that portion from Chattanooga to Lookout Bluffs to be completed by the 1st of December next. The other sections to be finished successively on toward the West end of the Division—the last by the 1st of October, 1851.

The most satisfactory testimonials will be required. The payments will be made in cash—reserving the usual 20 per cent. until the completion of the work.

By order of the Board.

JAMES H. GRANT, Chief Eng.

Nashville, Tenn., March 14, 1850.

PROPOSALS will be received at the offices of the Baltimore and Ohio Railroad Company, at Baltimore, Cumberland and Wheeling, up to Wednesday, the 22d day of May next inclusive, for the graduation and masonry of the portion of that road, extending from the bridge on the northwestern turnpike, over the Tygart's valley river, to a point on the south fork of Fish creek, near the mouth of Long Drain, embracing some 56 sections. Also the 8 sections between the mouth of Grave creek and the city of Wheeling.

A variety of work will be presented by the line to be let, which will include light and moderately heavy grading. Several short tunnels, and a considerable amount of bridge masonry.

Specifications may be had at the above named offices on and after the 1st of May ensuing, and further information obtained from the engineer upon the line.

Unexceptionable testimonials of character must accompany the bids, and the bidders are requested to state what other work, if any, they are engaged in, and when it will be completed.

The work must be energetically prosecuted.

By order of the President and Directors,
BENJ. H. LATROBE, Chief Engineer.
Baltimore, April 10, 1850. 16

Great American Engineering AND MECHANICAL WORK, just published in medium folio, 75 cts.

Part IV of "Specimens of the Stone, Iron and Timber Bridges, Viaducts, Tunnels, &c. &c. of the United States Railroads." By George Duggan, Architect and Civil Engineer.

The present part contains beautifully executed plans, and elevations, of the Starucca, Pa., (stone) Viaduct of 17 arches, 50 feet span each, grade line averaging 90 feet above the valley bed, with the specifications, estimates, &c. &c. Also plates of the details of the timber and iron work of the elegant timber arch 275 feet span, at Cascade Creek, Pa. on the line of the N. Y. & Erie R. R.

N.B.—This work is published by subscription of the most eminent in the engineering profession of the U. States, and will be completed in 12 parts, at 75 cents each to those who remit their names and subscriptions before the 1st June next—when the first 6 parts or one half of the work will be published—after which the price will be raised to \$1 per part.

To those making a present remittance of \$5, and the remainder \$4, when they have been supplied with the first six parts, the work will be forwarded regularly as published. Parties remitting \$9 shall receive it monthly post-free in any part of the United States.

"It is a work that was a great desideratum, and must prove of great benefit to the engineering profession generally, and especially to the tyro in practical engineering and mechanical knowledge; in truth it strikes us, that it would require years of labor and patient toil on the part of a young engineer to prepare the drawings, and collect the information that will be embodied in this work, and can now be secured for the trifling sum of \$9"—[Scientific Amer. March 16, 1850.]

In connection with this subject (Iron Railroad Structures) we take occasion to call attention again to Mr. Duggan's valuable and expensive publication, exhibiting drawings, with full descriptions of the various stone, iron and wooden bridges, viaducts, tunnels, culverts, etc., of all the Railroads in the United States. Mr. Duggan is an accomplished Architect and Civil Engineer, who came from Ireland to this country to exercise his profession; but finding Railroad construction here, in many respects, different from that he had been accustomed to in Europe, he applied himself to the study of our system; and the fruits of his researches and investigations embodied in this work, are well calculated to meet the exigencies of engineers, and to assist draughtsmen, bridge builders, mechanics and students. The work will be supplied to subscribers only, in 12 parts, at 75 cents each.—[N. Y. Journal of Commerce, Feb. 14, 1850.]

Published by **GEORGE DUGGAN,**
300 Broadway, New York.

To whom all communications should be addressed, and subscriptions forwarded.

FOWLER M. RAY'S Patent India-rubber Railroad CAR SPRING.

New York and Erie Railroad Shops.
Piermont, March 26, 1850.

This will certify that from practical experience in the use of Fowler M. Ray's India rubber Car Springs, I believe them to be far superior to any others now in use.

I have never known them to be affected by any change of temperature, as other Rubber Springs have been affected on this road.

I am at the present time repairing a Passenger Car that Mr. Ray and myself mounted with his springs about two years and eight months since.

The springs are at the present time as perfect, to all appearances, as when first applied to the car.

Respectfully yours,

HORACE B. GARDNER,
Foreman of the Car Shops.

Supt. Office N.Y. & H. R.R.,
New York, March 8, 1850.

This is to certify that we have used the Rubber Springs manufactured by Mr. F. M. Ray for the past twenty months, "both for Passenger and Freight Car Springs and Bumpers, and of different sizes," and have in every case given entire satisfaction, and I consider them the best spring now in use.

M. SLOAT, Supt.

Harlem R.R. Depot,
New York, March 7, 1850.

This is to certify that we have used Mr. F. M. Ray's India-rubber Springs for over eighteen months, and find them to be easy and durable, and recommend them to railroad companies as being superior to anything we have tried.

J. M. SMART,
Foreman at 42d St. Depot.

Office of the New Jersey Railroad Co.,
Jersey City, March 7, 1850.

This is to certify that we have had Mr. F. M. Ray's India-rubber Springs in constant use under our cars, and as Bumper Springs for upwards of two years, and they have in every way given perfect satisfaction.

The present form of spring we deem far superior to the form of Disk, having used both forms, although we have none of those made in Disks at present in use.

We take pleasure in recommending these springs to all railroad companies.

J. P. JACKSON, Vice Pres.
New Jersey Railroad and Trans. Co.

Roxbury, February 28, 1850.

In compliance with your request, I take great pleasure in stating the result of my experience in the use of "Ray's Patented Vulcanised India-rubber Car and Engine Springs." We have used them nearly two years, and never had one fail in any way. The cold weather does not affect them, as it has other rubber springs we have used.

With sixteen years' experience as superintendent of machinery on the Boston and Providence railroad, I take pleasure in saying that your springs are the best we ever used, or I ever saw used elsewhere. We have 20 cars rigged with them, of which I can say that the springs are as good now as when first applied. I put 24 lbs. of the rubber under the forward end of one of our heaviest engines, taking off 250 lbs. of steel springs—it has been in use 18 months, and is in as good condition now as when first put under the engine.

Very respectfully yours,

GEO. S. GRIGGS,
Supt. of Machinery, Boston and Prov. R.R.

New York, March 11, 1850.

I have used the Patent India-rubber Spring purchased of Mr. Ray, upon the cars of the New York and New Haven Railroad, and have found them efficient and economical; and when applied to the axles and draw springs, believe them to be quite equal to any in use. I have found a combination of these springs with a steel spring under the transom beam a very satisfactory arrangement, and am now using this plan in all new cars.

Yours respectfully,
ROBERT SCHUYLER.

February 25, 1850.

From practical observation of the use of the India-rubber Car Springs, manufactured and sold by your company, we are entirely satisfied in their application, and do not hesitate to recommend them as elastic, durable, requiring no repairs for years, and retaining their consistency during all extremes of weather. We have applied them for the past two years, and consider them superior for all railroad purposes.

Yours truly,

OSGOOD BRADLEY, Car Builder, Worcester.
T. & C. WASON, do. Springfield.
DEAN, PACKARD & MILLS, do. do.
DAVENPORT & BRIDGES, do. Cambridgeport.

Office New Jersey Railroad Co.,
Jersey City, March 8, 1850.

FOWLER M. RAY, Esq.,

Dear Sir: In answer to your enquiries respecting the operation of the Vulcanised Rubber Springs, purchased by our company from you some two years since, I reply that they are superior to any spring in use, (that I have either seen or heard of).

The improved form of your spring, consisting of a solid piece of vulcanised rubber with bands on the outside, is far superior to your first form, consisting of disks of rubber with metallic plates interposed.

The last named form was tried, if you recollect, at a much earlier period; and then was replaced by your last form.

I have no hesitation in saying that your springs have given entire satisfaction, and most cheerfully recommend them to railroad companies throughout the country for the following reasons:

1st. The cost is 30 per cent. less.
2d. Saving of weight on each car of 8 wheels from 700 to 800 lbs.
3d. Less care and attention is required, as they are not liable to get out of repair.

4th. A great saving is secured in the wear and tear of the cars and rails from their great elasticity.

5th. The freedom from noise.

6th. There is greater safety in case of accident, as they cannot be broken.

7th. The comfort of passengers is enhanced sufficiently to pay the expense, waiving all the other reasons that I have given.

Should this fail to satisfy any person enquiring, you are at liberty to refer to me, No. 150 Washington St., Jersey City.

Yours respectfully,

T. L. SMITH, Supt.

Fall River, February 2, 1850.

In answer to yours of the 20th ult. I would say that this company has for some 10 or 12 months past been using "Ray's India-rubber Springs." We have applied them to both passenger and freight cars with uniform success. They have invariably preserved their elasticity and consistency through all the extremes of weather; and we are now applying them whenever the steel spring fails. I am well satisfied that they are particularly adapted for railroad purposes.

Very respectfully yours,

GEO. HAVEN,
Supt. Fall River Railroad.

Jersey City, March 9, 1850.

This is to certify that the present form of Mr. F. M. Ray's India-rubber Car Spring I consider far superior to the form of Disk, having used both forms.

I take pleasure in recommending these springs to all railroad companies.

DAVID H. BAKER,
Foreman of Car Shop of N.J. R.R. & Trans. Co.

Boston, March 5, 1850.

In answer to your enquiry about India-rubber Springs, I have to say that we have used them to a considerable extent on both freight and passenger cars, and also on several of our tenders; and I am very well satisfied that they answer all the purposes for which they are intended. I believe the India-rubber will soon supersede all other springs for cars and tenders.

Yours truly,

S. M. FELTON,
Supt. Fitchburg Railroad.

Old Colony Railroad Office,
Boston, March 6, 1850.

EDWARD CRANE, Esq.,

President New England Car Co.,

Dear Sir: In compliance with your request I would state that the Old Colony Railroad Com'y have had in use upon their road, India-rubber Springs furnished by your company, for more than eighteen months past, during which time they have been extensively used under Passenger and Freight Cars, Locomotive Tenders, and for Drawer and Buffing Springs, with the most perfect success. The elasticity and consistency of the Rubber has never been unfavorably affected by either extremes of heat or cold—and from the experience which we have had in the use of Rubber Springs, I think them well adapted for railroad purposes—and therefore we have for some months past used Rubber almost exclusively, in all places where springs are required.

Respectfully yours, etc.,

JAS. H. MOORE,
Supt. O. C. Road.

Troy, February 27, 1850.

We have been using your India-rubber Car Springs for nearly two years—and we take pleasure in saying that in our opinion the rubber has to a certain extent already, and may eventually entirely supersede all other Springs for Railroad Car purposes. We now use it entirely for Draw Springs and Bumpers, considering it better and lighter than steel.

During our two years' experience in the use of it, we have not known any to lose their elasticity, or fail in any way; and we cheerfully recommend the rubber for railroad car springs.

Very respectfully,
EATON, GILBERT & CO.

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And in the principal cities and towns in the U. States. The Premium of the AMERICAN INSTITUTE was awarded to the Etna Safety Fuse at the late Fair held in this city.

November 3, 1849.

ly

American Railway Guide, AND POCKET COMPANION FOR THE UNITED STATES;

CONTAINING Correct Tables, showing the time for starting of trains from all stations, distances, fares, etc., on all the Railway lines in the U. States; also many of the principal Steamboat and Stage routes—accompanied by a complete RAILWAY MAP. Price, single copies 10 cts., or \$1 per annum. Published on the first of every month, corrected from returns furnished by the Railway Superintendents throughout the Union.

This book has been compiled somewhat on the plan of Bradshaw's Guide, with such improvements in size, form and arrangement as have seemed desirable; and the publisher confidently hopes it will not be found liable to the objections of incompleteness and incorrectness, which have been made, and justly too, against various other similar works heretofore issued.

The subscriber having had the management of the NEW YORK PATHFINDER almost from its commencement, has enjoyed superior facilities in obtaining information relating to the thoroughfares of travel, and is therefore well qualified to prosecute with success the arduous undertaking of furnishing a complete and correct national guide book.

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Clement, Wm. H.,

Little Miami Railroad, Cincinnati, Ohio.

Cozzens, W. H.,

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Alfred W. Craven,

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Harry, P.,

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Stark, George.,

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United States Fort, Bucksport, Me.

Thomson, J. Edgar.,

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Troost, Lewis,

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" E. Pratt & Brother, Baltimore.

John Barstow, Esq., Providence.

Lewis Bullard, Esq., Boston.

February 9, 1850.

6m*

United States Railroad Guide and Steamboat Journal.

CONTAINING OFFICIAL TIME ADVERTISEMENTS, Tables of Stations, Distances, Fares, Time, etc., with much miscellaneous matter for the travelling public. Price 12 cents a copy. Yearly subscription \$1. Published at 43 Ann street, New York.

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Of all Descriptions, Warranted Good.

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20 CLIFF STREET, NEW YORK,

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Of all descriptions. Warranted Good

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Manufacturers of Machinists' Warranted Best Cast Steel Files, expressly for working upon Iron and Steel, made very heavy for recutting.

A full Stock of Steel and Files at all times on hand. 6m4

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Sup't Transportation Providence and Worcester R.R., Providence, R.I. Has had 13 years' experience in Operating Railroads. Will go South or West if applied to.

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112 WILLIAM ST., NEAR JOHN.
3-4 and 6-4 Damasks, Union and Worsted; Mo-
reens, Rattinetta, Cloths, Silk and Cotton Velvets,
English Bunting

To Engineers and Surveyors.
E. BROWN AND SON Mathematical Inst. mak-
ers No. 27 Fulton Slip, New York, make and keep
for sale, Theodolites, Levelling inst., Levelling rods,
Surveyors Compasses, and Chains, Cases of Mathe-
matical drawing insts. various qualities, together with
a general assortment of Ivory Scales and small insts.
generally used by Engineers.

**Samuel Kimber & Co.,
COMMISSION MERCHANTS**
WILLOW ST. WHARVES, PHILADELPHIA.
AGENTS for the sale of Charcoal and Anthracite
A Pig Iron, Hammered Railroad Car and Locomo-
tive Axles, Force Pumps of the most approved con-
struction for Railroad Water Stations and Hydraulic
Rams, etc., etc.
July, 27, 1849.

James Herron, Civil Engineer,
OF THE UNITED STATES NAVY YARD,
PENSACOLA, FLORIDA.,
PATENTEE OF THE
HERRON RAILWAY TRACK.
Models of this Track, on the most improved plans,
may be seen at the Engineer's office of the New York
and Erie Railroad.

To Railroad Companies.
—WROUGHT IRON WHEELS—
SAFETY AND ECONOMY.
NORRIS' LOCOMOTIVE WORKS,
SCHENECTADY, NEW YORK,
Are Manufacturing Wrought Iron Driving, Truck,
Tender, and Car Wheels—made from the best Ameri-
can Iron. Address E. S. NORRIS.
May 16, 1849.

Machinery Warehouse.
S. C. HILLS, No. 43 Fulton street, New York, has
constantly for sale Steam Engines, Boilers, Lathes,
Chucks, Drills, Planers, Force and Suction Pumps;
Tonnage, Morticing and Boring Machines, Shingle
Machines, Bolt and Nut Machines, Belting, Oil, Iron
and Lead Pipe; Rubber, Percha and Leather Hose,
&c., &c.
S. C. H.'s arrangements with several machine shops
are such that he can supply, at very short notice, large
quantities of machinery.
November 23, 1849.

**George O. Robertson,
BROKER IN SCOTCH AND
AMERICAN PIG IRON;**
Bar Iron, Lead, Spelter, Tin, Copper, etc.,
No. 4 Liberty Place, MAIDEN LANE,
(Near Broadway,)
NEW YORK

**Manufacture of Patent Wire
ROPE AND CABLES,**
For Inclined Planes, Suspension Bridges, Standing
Rigging, Mines, Cranes, Derrick, Tilters, &c., by
JOHN A. ROEBLING, Civil Engineer,
TRENTON, N. J.

**Samuel D. Willmott,
MERCHANT, AND MANUFACTURER OF
CAST STEEL WARRANTED SAWS,**
—AND FILES—
IMPORTER OF THE
GENUINE WICKESLY GRINDSTONES
NO. 8 LIBERTY STREET,
NEW YORK.

**Doremus & Harris,
ANALYTICAL & CONSULTING CHEMISTS,
179 BROADWAY, NEW YORK.**
SCHOOL OF CHEMISTRY.

IRON.

Railroad Iron.
3,000 TONS C. L. MAKE 63½ lbs. per yard,
now landing and to arrive.
Also contracts made for future delivery of above su-
perior make English Iron.
300 Tons Banks Best Iron, Round, Square and Flat.
200 " English Bar " " " "
10 " 9-16 Square Iron for Railroad Spikes.
For sale in lots to suit purchasers by
DAVID W. WETMORE.
New York, March 26, 1850. 3m

**SPRING STEEL FOR LOCOMOTIVES, TEN-
DERS AND CARS.**—The subscriber is engaged
in manufacturing spring steel from 1½ to 6 inches in
width, and of any thickness required: large quantities
are yearly furnished for railroad purposes, and wher-
ever used its quality has been approved of. The estab-
lishment being large, can execute orders with great
promptitude, at reasonable prices, and the quality war-
ranted. Address J. F. WINSLOW, Agent,
Albany Iron and Nail Works.

Railroad Iron.
THE Undersigned, Agents for Manufacturers, are
prepared to contract to deliver Rails of superior
quality, and of any size or pattern, to any ports of dis-
charge in the United States.
COLLINS, VOSE & CO.,
158 South St.
New York, November 17, 1849.

Railroad Iron.
1,500 Tons weighing 59 lbs. per lineal yard.
500 " " 57 " " "
500 " " 56 " " "
500 " " 60 & 61 lbs. "
Also 2½x½ flat rails. All the above being of approv-
ed patterns. For sale by
DAVIS, BROOKS, & CO.,
68 Broad street.
N.B.—Rails imported on commission, or at a fixed
price.

Iron.
Pig Iron, Anthracite and Charcoal; Boiler and Flue
Iron, Spring and Blistered Steel, Nail Rods, Best Re-
fined Bar Iron, Railroad Iron, Car Axles, Nails, Stove
Castings, Cast Iron Pipes of all sizes, Railway Chairs
of approved patterns for sale by
COLEMAN, KELTON & CAMELL,
109 N. Water St., Philadelphia.

IRONDALE PIG METAL, MANUFACTURED
and for sale by the Bloomsburg Railroad Iron Co.
DUDLEY FISHER, Treasurer.
75 N. Water St., Philadelphia.

Railroad Iron.
500 Tons, afloat, weighing 57 pounds per lineal
yard, for sale by
COLLINS, VOSE & CO.,
158 South St.
New York, November 17, 1849. 1m46

Railroad Iron.
1675 Tons, weighing about 61 lbs. per yard, 90
tons, weighing about 52 lbs. per yard, and
825 tons, weighing about 53½ lbs. per yard, of the lat-
est and most approved patterns of Teraill, for sale by
BOORMAN, JOHNSTON & CO.,
119 Greenwich street.
New York, Feb. 25, 1850.

N.B.—B., J. & Co are also prepared to take con-
tracts for English rails, delivered in any of the Atlan-
tic ports of the United States.

Railroad Iron.
THE UNDERSIGNED, HAVING made arrange-
ments abroad, are prepared to contract for the de-
livery of Foreign rails, of approved brands upon the
most favorable terms.
They will also make contracts for American rails,
made at their Trenton works, from Andover Iron, in
whole or in part, as may be agreed upon.
They are prepared to furnish Telegraph, Spring and
Market Wire; Braziers and Wire Rods; Rivets and
Merchant Bars to order, all made exclusively from An-
dover Iron. The attention of parties who require iron
of the very best quality for special purposes, is respect-
fully invited.
COOPER & HEWITT,
17 Burling Slip, New York.
February 15, 1850.

Glendon Refined Iron.

Round Iron, Band Iron, Hoop Iron,
Square " Flat " Scroll "
Axles, Locomotive Tyres,
Manufactured at the Glendon Mills, East Boston, for
sale by **GEORGE GARDNER & CO.,**
5 Liberty Square, Boston, Mass.
Sept. 15, 1849. 3m37

**PATENT HAMMERED RAILROAD, SHIP &
BOAT SPIKES.**—The Albany Iron Works
have always on hand, of their own manufacture, a
large assortment of Railroad, Ship and Boat Spikes
from 2 to 12 inches in length, and of any form of head
From the excellence of the material always used in
their manufacture, and their very general use for rail-
roads and other purposes in this country, the manu-
facturers have no hesitation in warranting them fully
equal to the best spikes in market, both as to quality
and appearance. All orders addressed to the subscrib-
ers at the works will be promptly executed.

JOHN F. WINSLOW, Agent.
Albany Iron and Nail Works, Troy, N. Y.
The above Spikes may be had at first prices, of
Erastus Corning & Co Albany; Merrill & Co., New
York; E. Pratt & Br 10 E. Street Md

**LAP—WELDED
WROUGHT IRON TUBES**
FOR
TUBULAR BOILERS,
FROM ONE AND A QUARTER TO SEVEN
INCHES IN DIAMETER.

THE ONLY Tubes of the same quality and man-
ufacture as those so extensively used in England,
Scotland, France and Germany, for Locomotive, Ma-
rine and other Steam Engine Boilers.
THOMAS PROSSER & SON, Patentees,
28 Platt street, New York.

Railroad Iron.
THE UNDERSIGNED ARE PREPARED TO
contract for the delivery of English Railroad Iron
of favorite brands, during the Spring. They also re-
ceive orders for the importation of Pig, Bar, Sheet, etc.,
Iron.
THOMAS B. SANDS & CO.,
22 South William street,
New York.
February 3, 1849.

Iron Store.
THE Subscribers, having the selling agency of the
following named Rolling Mills, viz: Norristown,
Rough and Ready, Kensington, Philadelphia, Potts-
grove and Thorndale, can supply Railroad Companies,
Merchants and others, at the wholesale mill prices for
bars of all sizes, sheets cut to order as large as 59 in.
diameter; Railroad Iron, domestic and foreign; Loco-
motive tire welded to given size; Chairs and Spikes;
Iron for shafting, locomotive and general machinery
purposes; Cast, Shear, Blister and Spring Steel; Bol-
ter rivets; Copper; Pig iron, etc., etc.
MORRIS, JONES & CO.,
Iron Merchants,
Schuylkill 7th and Market Sts., Philadelphia.
August 16, 1849. 1y33

Railroad Iron.
THE MOUNT SAVAGE IRON WORKS, AL-
legany county, Maryland, having recently pass-
ed into the hands of new proprietors, are now prepar-
ed, with increased facilities, to execute orders for any
of the various patterns of Railroad Iron. Communi-
cations addressed to either of the subscribers will have
prompt attention. **J. F. WINSLOW, President**
Troy, N. Y.

ERASTUS CORNING, Albany
WARREN DELANO, Jr., N. Y.
JOHN M. FORBES, Boston.
ENOCH PRATT, Baltimore, Md.
November 6, 1849.

Railroad Iron.
THE SUBSCRIBERS ARE PREPARED TO
take orders for Railroad Iron to be made at their
Phoenix Iron Works, situated on the Schuylkill Riv-
er, near this city, and at their Safe Harbor Iron Works,
situated in Lancaster County, on the Susquehanna
river; which two establishments are now turning out
upwards of 1800 tons of finished rails per month.
Companies desirous of contracting will be promptly
supplied with rails of any required pattern, and of the
very best quality.

REEVES, BUCK & CO.,
45 North Water St., Philadelphia.
March 15, 1849.

Monument Foundry.

A. & W. DENMEAD & SON,
Corner of North and Monument Sts.,—Baltimore,

HAVING THEIR

IRON FOUNDRY AND MACHINE SHOP

In complete operation, are prepared to execute faithfully and promptly, orders for Locomotive or Stationary Steam Engines, Woolen, Cotton, Flour, Rice, Sugar Grist, or Saw Mills, Slide, Hand or Chuck Lathes, Machinery for cutting all kinds of Gearing, Hydraulic, Tobacco and other Presses, Car and Locomotive patent Ring Wheels, warranted,

Bridge and Mill Castings of every description, Gas and Water Pipes of all sizes, warranted, Railroad Wheels with best faggotted axle, furnished and fitted up for use, complete

Being provided with Heavy Lathes for Boring and Turning Screws, Cylinders, etc., we can furnish them of any pitch, length or pattern.

Old Machinery Renewed or Repaired—and Estimates for Work in any part of the United States furnished at short notice.

June 8, 1849.

Iron Wire.

REFINED IRON WIRE OF ALL KINDS,
Card, Reed, Cotton-flver, Annealed, Broom, Buckle, and Spring Wire. Also all kinds of Round, Flat or Oval Wire, best adapted to various machine purposes, annealed and tempered, straightened and cut any length, manufactured and sold by

ICHABOD WASHBURN.

Worcester, Mass., May 25, 1849.

American and Foreign Iron.

FOR SALE,

300 Tons A 1, Iron Dale Foundry Iron.
100 " 1, " " "
100 " 2, " " "
100 " " Forge " "
400 " Wilkesbarre " "
100 " "Roaring Run" Foundry Iron.
300 " Fort " "
50 " Catocin " "
250 " Chikiswalungo " "
50 " "Columbia" "chilling" iron, a very superior article for car wheels.
75 " "Columbia" refined boiler blooms.
30 " 1 x 1 Slit iron.
50 " Best Penna. boiler iron.
50 " "Puddled" " "
50 " Bagnall & Sons refined bar iron.
50 " Common bar iron.

Locomotive and other boiler iron furnished to order.

GOODHUE & CO.,

New York.

64 South street

American Pig, Bloom and Boiler Iron.

HENRY THOMPSON & SON,
No 57 South Gay St., Baltimore, Md.,

Offer for sale. *Hot Blast Charcoal Pig Iron* made at the *Catocin* (Maryland), and *Taylor* (Virginia), *Furnaces*; *Cold Blast Charcoal Pig Iron* from the *Cloverdale* and *Catawba*, Va., *Furnaces*, suitable for *Wheels* or *Machinery* requiring extra strength; also *Boiler and Flue Iron* from the mills of *Edge & Hilles* in Delaware, and *best quality Boiler Blooms* made from *Cold Blast Pig Iron* at the *Shenandoah Works*, Va. The productions of the above establishments can always be had at the lowest market price, for approved paper.

American Pig Iron of other brands, and *Rolled and Hammered Bar Iron* furnished at lowest prices. Agents for *Watson's Perth Amboy Fire Bricks*, and *Rich & Cos. New York Salamander Iron Chests*.

Baltimore, June 14, 1849.

6 mos

Wheel, Forge and Foundry Iron.

LOCUST GROVE Wheel-Iron of great strength and superior chilling property.
Balt. Charcoal Forge Iron, from Patuxent, Curtis Creek and Gunpowder furnaces.

Elkridge Foundry Iron, of superior strength and softness. Anthracite and Charcoal Iron from Pennsylvania and Virginia. Gas and Water Pipes, Lamp Posts from Elkridge furnace.

LEMMON & GLENN,

6m9

62 Buchanan's Wharf, Baltimore.

Iron.

THE SUBSCRIBERS having resumed the agency of the New-Jersey Iron Company, are prepared to execute orders for the different kinds and sizes of Iron usually made at the works of the company, and offer for sale on advantageous terms.—

150 tons No. 1 Boonton Foundry Pig Iron.
100 " No. 2 do. do. do.
300 " Nos. 2 & 3 Forge do. do.
100 " No. 2 Glendon do. do.
140 " Nos. 2 & 3 Lehigh Crane do do.
100 " No. 1 Pompton Charcoal do.
100 " New-Jersey Blooms
50 " New-Jersey Faggoting Iron, for shafts
Best Bars, $\frac{1}{2}$ to 4 inch by $\frac{1}{2}$ to 1 inch thick.
Do do Rounds and Squares, $\frac{1}{2}$ to 3 inch.
Rounds and Squares, 3-16 to 1 inch.
Half Rounds, $\frac{1}{2}$ to 1 in. Ovals & Half Ovals $\frac{1}{2}$ to 1 $\frac{1}{2}$ in.
Bands, $\frac{1}{2}$ to 4 inch. Hoops, $\frac{1}{2}$ to 2 inch.
Trunk Hoops, $\frac{1}{2}$ to 1 $\frac{1}{2}$ in. Horse Shoe & Nut Iron.
Nail Plates. Railroad Spikes.

DUDLEY B. FULLER & Co., 139 Greenwich-st. and 85 Broad-st.

WILLIAM JESSOP & SONS' CELEBRATED CAST-STEEL.

The subscribers have on hand, and are constantly receiving from their manufactory,

PARK WORKS, SHEFFIELD,

Double Refined Cast Steel—square, flat and octagon. Best warranted Cast Steel—square, flat and octagon. Best double and single Shear Steel—warranted. Machinery Steel—round.

Best and 2d gy. Sheet Steel—for saws and other purposes.

German Steel—flat and square, "W. I. & S." "Eagle" and "Goat" stamps.

Genuine "Sykes," L. Blister Steel.

Best English Blister Steel, etc., etc., etc.

All of which are offered for sale on the most favorable terms by **WM. JESSOP & SONS,**

91 John street, New York.

Also by their Agents—

Curtis & Hand, 47 Commerce street, Philadelphia.

Alex'r Fullerton & Co., 119 Milk street, Boston.

Stickney & Beatty, South Charles street, Baltimore.

May 6, 1848.

JOHNSON, CAMMELL & Co's Celebrated Cast Steel,

AND
ENGINEERING AND MACHINE FILES,
which for quality and adaptation to mechanical uses, have been proved superior to any in the United States. Every description of square, octagon, flat and round cast steel, sheet, shovel and railway spring steel, best double and single shear steel, German steel, flat and square, goat stamps, etc. Saw and file steel, and steel to order for any purposes, manufactured at their Cyclops Steel Works Sheffield.

JOHNSON, CAMMELL & CO.,

100 William St., New York.

November 23 1849.

Railroad Iron.

OF ANY PATTERN AND WEIGHT,
Of a Favorite Brand,

And deliverable in Bond, or Duty paid, at any Port of the U. S., contracted for on favorable terms, by

CHARLES ILLIUS,

20 Beaver St., New York.

Pig and other Iron also contracted for. Sole Agent for "Barter's Machine and Burning Oil"—particularly adapted for "Railroads" and other Machinery—Preferred to Spermin by the many now using it, and 25 per cent. cheaper.

CUT NAILS OF BEST QUALITY, BAR IRON
(including Flat Rails) manufactured and for sale by **FISHER, MORGAN & CO.,**
75 N. Water St., Philadelphia.

Ogden & Martin's ROSENDALE CEMENT.

WE are prepared to enter into arrangements for supplying our Cement for public works or other purposes. We warrant the cement equal in every respect to any manufactured in this country. It attains a great degree of hardness, sets immediately under water, and is a superior article for masonry coming in contact with water, or requiring great strength.

For sale in tight barrels, well papered, at their office by **OGDEN & MARTIN,** 104 Wall st.

February 16, 1850.

The above cement is used in most of the fortifications building by government.

To Steam Engine Builders.

THE Undersigned offer for sale, at less than half its cost, the following new machinery, calculated for an engine of 62 inches cylinder and 10 feet stroke, viz.

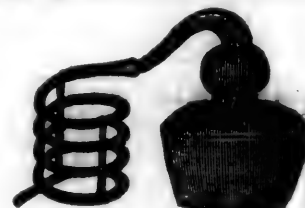
- 2 Wrought Iron Cranks, 60 inches from centre to centre.
- 1 Do. do. Connecting Rod Strap.
- 2 Do. do. Crank Pins.
- 1 Eccentric Strap.
- 1 Diagonal Link with Brasses.
- 1 Cast Iron Lever Beam (forked).

The above machinery was made at the West Point Foundry for the U. S. Steamer Missouri, without regard to expense, is all finished complete for putting together, and has never been used. Drawings of the cranks can be seen on application to

HENRY THOMPSON & SON,

No. 57 South Gay St., Baltimore, Md.

Sept. 12, 1849.

**P. H. Griffin,**

Corner of Steuben and James Sts. Albany, N.Y.

CONTINUES to manufacture copper flues for locomotive boilers, brewers' coppers, stills, tanner heaters, etc. Copper work in general, at the shortest notice. He has constantly on hand brass cocks, brass valves, copper pumps of every variety.

Orders promptly attended to.

ly14

To Railroad Companies.

FOR SALE—A Second-hand Locomotive Engine and Tender, of about 10 tons weight, in good order, and warranted to perform well. Any company wanting a cheap engine for a passenger or light burden train, will rarely meet with an opportunity so favorable as the present. The engine and tender are in perfect running order, and will be tested to the satisfaction of any one wishing to purchase. Price \$1,500.

Address

J. B. MOORHEAD,

Frazer P.O., Chester county, Pa.

P.S.—The Engine can be seen by calling on H. Osmond & Co., Carbuilders, Broad st., Philadelphia.

September 6, 1849.

India-rubber for Railroad Cos.

RUBBER SPRINGS—*Bearing and Buffer—Fuller's Patent*—Hose from 1 to 12 inches diameter. Suction Hose. *Steam Packing*—from 1-16 to 2 in. thick. *Rubber and Gutta Percha Bands*. These articles are all warranted to give satisfaction, made under Tyer & Helm's patent, issued January, 1849.—No lead used in the composition. Will stand much higher heat than that called "Goodyear's," and is in all respects better than any in use. Proprietors of railroads do not find it overcharged by pretenders.

HORACE H. DAY,

Warehouse 23 Courtlandt street.

New York, May 21, 1849.

To Railroad Companies and Contractors.

FOR SALE—Two Locomotive Engines and Tenders, at present in use on the Beaver Meadow Railroad, being too light for their coal trains, but well calculated for either gravel or light passenger trains.

They weigh, in running order, about 8 tons each—having one pair of driving wheels 4 feet diameter, 4 truck wheels 30 inches diameter, with cylinders 10 in. diameter, and 18 inches stroke of piston. Tenders on 4 wheels. Address **JAMES ROWLAND,**

Prest. Beaver Meadow Railroad & Coal Co.,

Philadelphia.

or, **L. CHAMBERLAIN, Sec'y,**

at Beaver Meadow, Pa.

May 19, 1849.

Rosendale Cement.

THE NEWARK AND ROSENDALE LIME AND CEMENT CO. are now manufacturing at their works in NEWARK, N. J., and Ulster county, N.Y., a very superior article of *Hydraulic Cement*—also Lime Calcine Plaster, etc. Contractors and dealers will find it to their advantage to call or make application before purchasing elsewhere. All communications addressed to the subscriber, at Newark, N.J., will be punctually attended to.

ly*15

HENRY WILDE, Secretary.

Fire Brick.

THE Subscribers have constantly on hand Rafford's Stourbridge, Oak Farms Stourbridge, Lister, Wortley, Red and White Welsh Fire Bricks, common and fancy shapes. Also,

ROOFING SLATES,

from the best Welch quarries, and of all sizes. Also,

COAL,

of all kinds—Liverpool Orrell and Cannel, Scotch, New Castle, Pictou, Sidney, Cumberland, Virginia, and all kinds of Anthracite coals. Also,

Pig Iron, Salt, etc., etc., for sale at the lowest market price. Apply to

SAMUEL THOMPSON & NEPHEW,
275 Pearl and 43 Gold Sts., New York.

November, 23, 1849.

**NORRIS' LOCOMOTIVE WORKS,
SCHENECTADY, N. Y.**

THESE Works are in full operation in Manufacturing to order, Locomotive Steam Engines & Tenders, of the best principle and construction of material, using wrought iron heavy frames with pedestals welded thereto, and all parts of the engine made of the best wrought iron, except cylinders, pumps and boxes—obtaining greater durability, and carrying less weight over the road, than engines constructed of cast iron.

Wrought Iron Tires made any required size, and Tire Bars bent and welded with dispatch.

Chilled Wheels for Cars, Trucks and Tenders, made from the toughest iron.

Driving and Tender and Car Wheels fitted to Axles with Brass Boxes and Springs, and Railroad Machinery generally. Manufactured and for sale by

April 11, 1849.

E. S. NORRIS.

**To the Proprietors of Rolling
Mills and Iron Works.**

THE Undersigned—Proprietors of Townsend's Furnace and Machine Shop, Albany—are extensively engaged in the manufacture of Machinery and fixtures for Iron, and Copper Rolling Mills, and Iron Works. Having paid particular attention to the manufacture of *Rolls* (Rollers), both *chilled* and *dry-sand*, they feel confident that they can execute orders for such castings in a satisfactory manner. And to give assurance of this, they beg leave to refer to the following named persons, proprietors and managers of some of the most extensive rolling mills in the country, viz: Jno. F. Winslow, J. Tuckerman, H. Burden, W. Burtt, J. & J. Rogers, Satus & Co., J. B. Bailey, L. G. B. Cannon, Hawkins & Atwater, etc., etc.

F. & T. TOWNSEND.

Albany, August 18, 1849.

Passenger Car Linings.

THE Advertiser continues to make to order the Enamelled Car Linings which have been so highly approved the last three years, and are now exclusively used by all the Northern Railroads. No pains are spared to get out new styles, and adapt them to the tastes of every consumer.

Orders addressed to CHARLES STODDER, No. 75 Kilby street, Boston, will have prompt attention.
March 23, 1850. 2m

CAUTION.

RAILROAD COMPANIES and others are hereby cautioned against using or vending our improvement for easing the lateral motion as applied on Railroad Cars. Letters Patent having been granted to us in 1841, any party or parties so making or using said improvement without license from us will be proceeded against according to law.

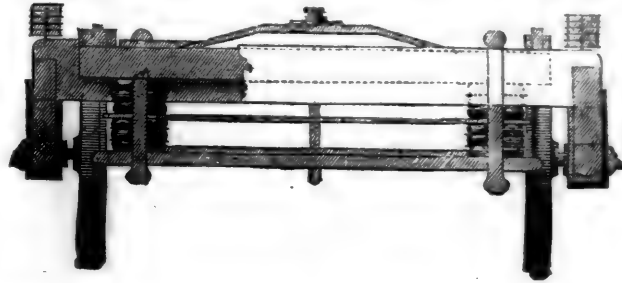
DAVENPORT & BRIDGES.

To Miners and Mining Companies.

THE undersigned would respectfully call the attention of those persons engaged in mineral operations on Lake Superior to the following list of articles which will be sold on accommodating terms, viz:

- 600 bbls. Corn fed No. 1 Mess Pork.
- 500 " Stall fed Mess Beef.
- 25,000 lbs. "Sugar cured canvassed" Hams.
- 2,200 " Dried Beef.
- 60,000 " "Kiln dried" Corn Meal,
- 500 bush. White "Field" Beans.
- 300 " Canada" Peas.
- 500 " Dried Apples.
- 100 bbls. and half bbls. "cucumber" Pickles.
- 50 " Sour Kroust.
- 30 bush. Onions.
- 1,000 Beefs' Tongues Smoked and in Pickle.
- 10,000 lbs. "Mould" Candles.
- 10,000 " "Hard" Soap.

Also, a full and large supply of all articles that may be required by Mining Companies and those connected with them.
C. A. TROWBRIDGE,
127 Jefferson Avenue, Detroit, Michigan.

**FULLER'S PATENT
INDIA RUBBER CAR SPRINGS.**

RAILROAD COMPANIES are cautioned, before purchasing Springs, to examine the actual patents and judge for themselves.

Persons, under the Title of the New England Car Company, seeking fraudulently to invade Fuller's rights have put forth so many statements for the purpose of misleading the public, that an enumeration of some facts is absolutely necessary, for the purpose of putting persons interested upon their guard.

Fuller's patent is for the application of Discs of India-rubber with Metal Plates, for forming Springs for Railway Cars and Carriages—either one disc and two plates, or ten discs and plates, or any other number, are equally covered by the patent. Fuller is not bound to the use of short discs—he may use long discs and plates.

Ray's patent is simply and wholly the forming of air tight rubber cylinders, with hoops or bands round the outside, and the combination of elasticity of India rubber, with the elasticity of atmospheric air confined in the cylinder, and in no part of his patent is he authorized to use the form of spring which he is now fraudulently supplying to Railroad Companies. Such springs are direct and positive infringements of the very letter of Fuller's patent.

Fuller's patent is dated October, 1845, Ray's patent, August, 1848.

The spring patented by Ray never has been put in operation, and never can be made useful for Railroad cars.

A mere experiment, even if made, it is well known does not prove an invention; and it is ridiculous for such parties to hope to mislead the Presidents and Superintendents of Railroad companies, by claiming the invention because Ray alleges he made an experiment—which Fuller had made before him—had actually brought into working order, and obtained a patent for—and this too before Mr. Ray states he made his experiment—and that experiment not claimed to have been applied to a car or carriage.

Besides, the invention could not have been developed until India rubber, properly Vulcanised, could be made of a sufficient thickness. In the United States the art of vulcanising rubber by steam heat, (by which

means only can a body of rubber having any considerable thickness be vulcanised,) was not introduced until after the grant by the American government of the patent for springs to Fuller—whereas the process of vulcanising rubber by steam heat was invented in England about three years previously, and was used by Fuller there. This fact refutes entirely the claim of invention put forth by Mr. Ray, and proves the impossibility of his pretensions being true.

Fuller was the first and only inventor of the spring. A Mr. Dorr, whose connection with Mr. Goodyear is well known in this country, applied in England to Mr. Fuller, after he had published and patented his invention, and introduced another party for the purpose of obtaining the agency for the United States. They were furnished with a complete set of drawings and models, and with instructions to make arrangements for the supply of material of American manufacture—from that hour to the present not a single communication has been received from them. Some of these identical models have been traced into the hands of parties now seeking to invade Fuller's rights, and who have exhibited them as specimens of their own invention.

After this, the conveyance was made by Goodyear to certain parties here for the use for railroad springs of what he calls his Metallic rubber. Comment is unnecessary.

There are 5 or 6 different processes for the manufacture of vulcanised rubber, patented by as many different parties, some here, some in England, either of which would probably make good springs.

A large and powerful company has been organised under the name of the Rubber Company, the particulars of which shall be given hereafter.

An action has been commenced against three railroad companies for infringement; and all other parties will assuredly be prosecuted if they continue farther to infringe upon Fuller's patent.

W. C. FULLER,

The only persons authorised to supply the Springs are G. M. KNEVITT, 38 Broadway, N. York,
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98 Broadway, opposite Trinity Church.
New York, October, 1849.

**Ibbotson, Brothers & Co's
CELEBRATED CAST STEEL**

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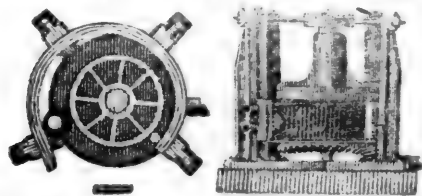
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April 22, 1849. 1y*17

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P. A. BURDEN, Agent,
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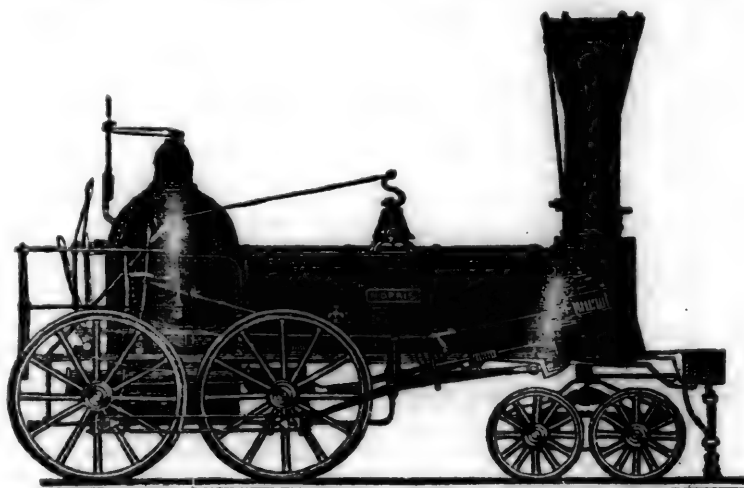
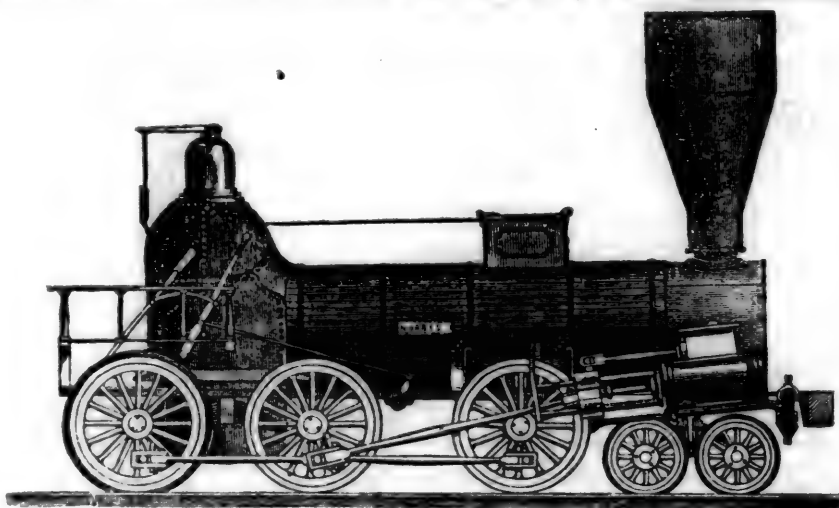
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March 12, 1848. }

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Orders for the above will be received and promptly attended to at this office. 32 ly.

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AMERICAN RAILROAD JOURNAL.

STEAM NAVIGATION, COMMERCE, MINING, MANUFACTURES.

HENRY V. POOR, Editor.

ESTABLISHED 1831.

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ASSISTANT EDITORS,

J. T. HODGE, *For Mining and Metallurgy.*
GEN. CHAS. T. JAMES, *For Manufactures and the
Mechanic Arts.*
M. BUTT HEWSON, C. E., *For Civil Engineering.*

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American Railroad Journal.

PUBLISHED BY J. H. SCHULTZ & CO., 136 NASSAU ST.

Saturday, May 11, 1850.

Iron Ores.

ST. LAWRENCE DISTRICT, NEW YORK.

In the account previously given of the ores of this district, no mention was made of the *Redwood furnace*, a new stack which went into operation the last year, and made in two different blasts, both within six months, five hundred tons foundry iron, mostly No. 1. We have received a section of the furnace and an interesting account of its workings, and remarks relative to the ores of the neighborhood, from Mr. G. W. Crain, who was employed to put in the hearth and lining for the present blast.—These data, which appear to have been collected with much care and accuracy, we present below as we have received them.

The *Redwood furnace* is on the outlet of a small lake one and a half miles from the village of Redwood in the town of Alexandria, and eight miles from the river St. Lawrence. It was built in 1848 by Mr. S. T. Hooker of Sacketts Harbor, under the direction and management of Mr. L. Bones.—The stack is of sandstone, 33 feet at the base and 34 feet high, where it is 25 feet across, having vent

holes every four feet without ties or binders of any kind—yet it has kept its shape very well so far.*

The blast is furnished by a wood blowing cylinder of six feet diameter, having four feet stroke, the wheel making seven revolutions a minute, yet so imperfect are the works that but twelve ounces pressure is all the gauge shows with two blow pipes of two and five eighths inch nozzle. The blast is in part regulated by a cylinder of wood, seven feet high and seven feet four inches diameter, having a floating head, the piston of which projects thro' the bottom and is attached to the weight box. The blast is heated by the gas similar to the Rossie furnace, and is carried in nine inch pipes down behind the lining in a recess of the wall, which is bricked up and filled with grout. The motive power is a breast wheel fourteen feet long and sixteen feet diameter.

The furnace was built to work ores found in its immediate neighborhood. The principal ore (Dewey bed) is three fourths of a mile from and belongs to the furnace. This is specular ore, yielding about 42 per ct. of the best kind of iron, but works very hard in the furnace. About a thousand tons of this was mined last year at an expense of about one dollar and a half a ton, when the bed was considered exhausted, but it is thought by many that large quantities of ore could be had by drifting into the hill at an expense of not more than two dollars per ton. A vein of ore half a mile from the furnace has been followed in forty or fifty feet, where it shows a thickness of twenty inches. A few tons of very good ore were taken from this place, but the expense of procuring it was so great the vein was abandoned. It is at the foot of a ledge of sandstone, and has an inclination of about 25° for the first 20 feet, then increases to about 60°. Besides

* Mr. Crain in a former communication and in his section represents the stack to be 33 feet high, 7 ft. 8 inches across the boshes, and 2 inches greater diameter 2 feet higher up. Diameter at tunnel head 31 inches: the iron cylinder or rather frustrum of a cone, which is let in at the top swelling to 34 inches at its base two feet down. Under and outside of this the gases pass to the heating oven.—The top of the boshes are nine feet above the bottom of the hearth; this is five and a half feet high, 32 inches across the top, 22 at the twerers and 21 at the bottom. The twerers are 22 inches up; boshes slope at top 46°, then 56°, and then 60°. The in walls are on a curve of 80 feet radius, the centre of which is on the same level with the greatest diameter of the furnace.

these, another bed has been opened two miles from the furnace, which has produced some of the best ore of the country. This is in compact feldspar and quartz. These beds furnished the ores used by the furnace the last year for two short and very indifferent blasts, and may be said to cost two dollars a ton at the furnace bank.

Charcoal can be had in any quantity at five cents the bushel there being a large tract of well timbered land lying around the furnace.

The furnace made five hundred tons of iron last year in two blasts of twenty two weeks in all, the cost of which I cannot even guess, there was so much alteration and repair.

Last fall the property went into the hands of Mr. S. Buckley of Watertown, who had the furnace repaired, and bought eight or nine hundred tons of ore at the Kearney, Keene and Stirling beds, of which about four hundred tons were Kearney ore, all of them costing two dollars a ton at the bed, and two dollars for hauling (distance from 21 to 23 miles). He also bought two hundred tons of Stirling ore at a cost of eighty cents at the bed and one dollar for hauling (distance 11 miles). These with the two hundred he had on hand costing two dollars a ton, will use up the eighty thousand bushels coal at the furnace when the blast commenced.

The furnace has been running near two months under the care of Mr. D. Christian, and works as freely as was ever known by any of the firemen.—The following is a record of the working of the furnace for the first seven weeks, the mercury in the pressure gauge standing the last four weeks at three quarters of an inch with 24 inch blow pipes.

Journal of the Redwood Furnace; blast put on April 9th, 1850.

	Lbs. ore.	Bush. coal.	Iron.
1st week.....	99,225	3,650	48,988
2d ".....	101,455	4,435	66,311
3d ".....	150,250	4,558	80,000
4th ".....	162,460	4,650	87,560
5th ".....	169,520	4,920	89,110
6th ".....	176,420	5,200	90,600
7th ".....	181,205	5,250	98,000
	1,040,535	32,664	560,569

By the above it will be seen that for the first seven weeks, which is not a fair test of the blast, 116 bushels of coal made a ton of iron; but if we look to the seventh week it will be seen that only 107 bushels are used, and this is quite one third made of hemlock.

The cost of working the furnace is as follows:

Founder, at \$2 50 per day.....	\$2 50
Two firemen, 1 50 each.....	3 00
Two topmen, 75 cts. each.....	1 50
One gutterman.....	1 00
One coal baker.....	1 00
One bank hand.....	0 75
One man with stamping mill.....	0 75
" horse and cart.....	1 25

\$11 75

So that when the furnace makes five tons a day the labor will be \$2 35, which I will call \$2 50 to be within bounds.

Cost of a ton of iron:*

1½ tons of ore, at \$4.....	\$6
¼ " " 2.....	1
	— \$7 00
116 bushels charcoal, at 5 cts.....	5 80
Labor 2 50, flux 20.....	2 70
Cartage to Alexandria bay.....	1 00

\$16 50

From Alexandria bay to any port on the lakes, iron is furnished for three dollars a ton, which includes commission, and an advance of twenty dollars a ton is made when delivered on the wharf, the manufacturer being allowed to bargain for its sale. Of the iron made at this furnace last year all was sold for thirty dollars except one small lot which brought twenty six dollars.

It is said by many that accounts of the stock used in a furnace are underrated, which I know is the case in some works. In one instance at a large establishment six and a half cents per bushel is paid for charcoal, when contracts at five cents have been offered on condition the coal were measured in the ten bushel box instead of the furnace "bushel basket," as it is called. The baskets at the Redwood furnace correspond very nearly with the legal measure of 2568 inches. The last running of the furnace at the close of the above account was at the rate of 52½ tons with 5200 bushels of charcoal.

Mr. Crain also sends some further accounts of the *Caledonia* furnace owned by Messrs. Skinner & Blish, and run the last year by Mr. D. Christian, who now has charge of the Redwood. It is two miles from the village of Oxbow in the town of Antwerp, about five miles from the Kearney ore bed, and a mile farther from the Keene and Sterling beds. It is a small stack with an eight feet lining, and hearth two feet across. The furnace and fixtures are nearly new; of substantial character, and the water power good. The shape of the stack is much like the Redwood, but the ore used yielded only about 43 per cent.

The following is the footing of the books for the blast of last summer and fall, since which time the furnace has been idle. The coal books show a purchase of 89,000 bushels of coal at four cents a bushel.....\$3,560 00
700 tons Stirling ore, at \$2..... 1,400 00
370 " " 2 25..... 832 50
Hauling same at 75 cts. a ton..... 802 50
589 tons Kearney ore, at \$2 25..... 1,305 00
Hauling same at 62½ cts..... 362 50
Paid for hauling 705 tons of iron to Alexandria bay, at \$2..... 1,410 00
Paid for labor to run furnace 4½ mos..... 1,325 00
" flux, say..... 75 00

\$11,072 50

To this should be added the other items of ex-

* In this estimate no account is made of superintendence, repairs and interest on capital, which are usually rated at from \$2 to \$3 per ton of iron.

J. T. H.

pense not included, as repairs, which in this instance were \$250, clerks' hire, six months' interest on \$10,000, the value of the works, and interest also on the expenditures, and the cost of superintendence.

The iron is rated to be worth at the least \$24 at Alexandria bay.

This furnace is well located for small expense of transportation of ore.

Rossie furnace is making from 10 to 13 tons a day. Stirlingville about 3½—cold blast iron. The Stirling furnace at Antwerp is idle, but will go into blast in June. The Carthage furnaces are abandoned.

Some very good beds of magnetic ore have lately been opened in the southeast part of St. Lawrence county.

Mr. Crain states that the reason why the specular ores are used for foundry iron is that in the western markets this is worth five to eight dollars a ton more than forge pig. The greatest trouble in working the ores is to keep the furnaces running hot enough to make good foundry iron.

A communication has also been received from *Cheshire*, Berkshire county, Mass., in relation to the furnace it is proposed to build there, to run the ores from the *Brown* and *King* beds, which are described in the articles on the hematites of Massachusetts.

The letter is from Mr. J. N. Richmond, who has been engaged in opening and proving these beds. He states that—"Operations in the ore beds subsequent to your examinations, fully meet your former expectations and predictions. We have raised about 1500 tons of ore from the Brown mine in extending the drifts and lowering shafts. The shaft now measures over 70 feet, and the drifts east and west over 80 feet, and the ore continues solid in both.

A young man by the name of Pettie has purchased all the property and commenced operations—has engaged under the charter and has opened his books for stock."

I have already expressed in the Journal the high opinion I entertained of the ore of this locality and the great advantages it possessed for the economical production of the best qualities of iron. But in the present condition and prospects of the iron business throughout the country, there is little encouragement for commencing new operations, even in the most favored localities. H.

CONSTRUCTION OF THE GRIMSBY DOCKS.

In accordance with the resolution of a special meeting of members, the session of the institution commenced on Tuesday evening, instead of, as heretofore, in the middle of January. This is a great improvement, as it assimilates the routine of this useful society to that of other scientific bodies. It will also prove very convenient to country members, give a greater number of meetings, and enable the session to terminate brilliantly with the President's conversazione.

The paper read was a "Description of the Coffer dam at the Grimsby Docks," by Mr. Charles Neate, Assoc. Inst. C. E. It commenced by briefly noticing the importance of preliminary structures in all works of hydraulic engineering, and the difficulties generally attending their execution. The position of Grimsby, on the south shore of the Humber, was then described; its proximity to the sea, the natural shelter afforded by the opposite shore of Spurn Head, and the various advantages it presented for the construction of extensive docks.

A general description followed of the enclosure made for the purpose of the dock-works, which comprised an area of 138 acres, and projected five-eighths of a mile beyond the margin of the high-water line of the shore. It was explained, that the

flatness of the coast necessitated this great projection, as it was requisite to found the new entrance locks in the low-water channel of the river, in order to secure, at all times, a sufficient depth of water for large vessels. These conditions regulated the position of the coffer dam, which stood in a very exposed situation, and was entirely self-supported. Its principal features were stated to be its extent, and the form of its construction. The length of the coffer dam was 1500 feet, supporting, at high water, a head of water of 25 feet; whilst the excavation behind it was carried to 11 feet below low water.—The form of the dam was that of a circular curve, with a versed sine of 200 feet, or nearly one-fifth of the span.

Several of the constructive arrangements were peculiar. The work consisted of a triple row of whole timber sheet piling, which derived interior support from counterforts, or buttresses of solid sheet piling, driven at intervals of 25 feet throughout its length. The long or through bolts were made to break joint and terminate at the middle row of piling, so that no water could pass along them through the dam. In the middle row of piling, wrought iron plating was substituted for timber walings, which formed excellent longitudinal ties, and left an uninterrupted surface on the piling, against which the puddle would lie compactly.

It was stated that these arrangements had imparted an extraordinary degree of stability and tightness to the structure, which had resisted the effects of storms, and the pressure of the tides, in the most perfect manner, during a period of fourteen months.

A portion of the ground, between the works and the shore, was described as being of a soft, silty clay, probably the site of an old channel; and as it was found, after all precautions, impossible to raise any solid structure upon it, the alternative was adopted of displacing it completely, by raising a bank of chalk stone rubble, which sunk down to the hard bed of clay beneath. This method was successful in forming a very fine embankment.

The abundant supply of water from Artesian wells in Grimsby was adverted to, and referred to to the vicinity of the chalk hills.

The conclusion of the paper drew attention to the magnitude of the masonry works now advancing at Grimsby, and for the formation of which the coffer dam was erected, and which, when completed, from the designs of Mr. Rendel, the chief engineer, and under the superintendence of Mr. Adam Smith, the resident engineer, will form, perhaps, one of the most useful, as well as the most important, maritime works of modern times.

The discussion upon the Grimsby docks being continued, the speakers, led by the Rev. the Dean of Westminster, in his usual able and energetic manner, were induced to diverge very widely from the original subject, to point out the acknowledged advantages that would result from engineers possessing a more accurate knowledge of geology, and being able to discriminate between strata by an examination of the component parts, and to decide upon their origin, as a guide in judging of their capability of supporting the weights likely to be placed upon them in the construction of works.

The Rev. Dean gave many instances where, in his opinion, more accurate geological knowledge would have secured greater success, or have prevented casualties. He quoted particularly the borings and the report said to have been made previous to the commencement of the Thames Tunnel, and the recent statement that the projected tunnel for receiving and conveying the sewerage of London down to the Essex marshes, would, throughout its entire length, have been in the London clay.—He showed, however, that no London clay was to be found eastward of St. Paul's, and that the plastic clay was constantly mistaken for it, in consequence of the observers not possessing a sufficiently accurate knowledge of the difference in the constituent features of the two clays.

On the other hand, although it was admitted that an accurate knowledge of geology was most valuable to engineers, it was contended that they were not so ill-informed on the subject as had been assumed. They did appreciate the necessity of that knowledge; and although they might not be able to discourse upon it with the eloquence of a Buckland, a Lyell, or a Sedgewick, or to speculate so

plausibly upon the events of past ages, no careful engineer ever decided upon the position, or mode of construction of his works, without a series of trial borings, a careful examination of the specimens, and experiments on them, chiefly with the view of ascertaining their strength, or capability for sustaining weights. Instead, therefore, of accusing engineers of knowing so little, it was rather a subject of surprise that they knew so much; for no profession demanded such varied acquirements, or the exercise of such general common sense and judgment.

It was shown that the position of the Thames Tunnel was not determined by the report, or the results of the borings, but with a view to establishing a connection between particular localities.—The borings were perhaps inefficiently made, as compared with those of the present day, with the improved apparatus now in use; but Mr. I. K. Brunel had made a very complete series of borings across the Thames, showing most accurately the strata of the bed, and no errors could have been induced by them.

The statement of the proposed sewer tunnel being in the London clay, never had been accepted by eminent men who understood their profession, however it might have been argued upon, as an assumed fact, by commissioners and boards of sewers.

The discussion was closed by the dean of Westminster giving an example of the urgency for engineers becoming geologists; and on Mr. Rendel stating, that the clay of Leith was so hard as to require to be blasted, and yet that, when exposed to a small current of water, was completely dissolved within a fortnight. This arose from the presence of a multitude of minute particles of mica, whose non-adhesive properties produced the speedy disintegration of the mass. This was admitted to be the fact, and had been observed and allowed by the engineer in the construction of the works.—*Prac. Mec. Journal.*

ON THE CONSTRUCTION OF SEWERS.

Sewerage.—Much difference of opinion exists as to the proper size for sewers for town drainage.—The Metropolitan Commissioners recommend the tubular system, varying from 6 to 24 inches in diameter, with a double line of pipes, and in low districts converging towards a central well, from whence the sewage is to be pumped by a steam engine, and forced to an outlet on the banks of the river. In the carrying out of this system it was intended only to have them of the bare minimum capacity required for house drainage, and storm water was to find exit in any way it could.

The Metropolitan Commissioners also condemned the sewerage works of the city of London, and the corporation in consequence called in Messrs. Walker, Cubitt and Brunel, the eminent engineers, to examine and report upon them. The report repudiated the idea of reducing the size of the city sewers, generally approved of the system adopted there, and recommended the extension of it to undrained streets and a system of flashing. They further state that London is the best drained city in the world, and that it is in advance of, and has taught all other cities lessons in sewerage.

Manchester, I believe, is the only town that has taken the initiative from the sanitary reports, and generally introduced tubular sewers, which it more efficient than brick construction, are also much more costly, as will appear by the following table:

Egg shaped tubular sewers.			Egg shaped brick sewers of the same capacity.		
In.	In.	Per yard.	In.	In.	Per yard.
12	by 9	at 4s. 6d.			2s. 6d.
16	by 12	at 7s. 6d.			3s. 0d.
20	by 15	at 10s. 6d.			3s. 6d.
25	by 18	at 15s. 0d.			4s. 0d.
29	by 21	at 21s. 0d.			4s. 6d.
36	by 24	at 27s. 0d.			5s. 0d.

This is exclusive of excavation in both cases.

An ingenious gentleman, named Wilkinson, of Newcastle, has invented a material for sewers, which he states is composed of a cement made in a peculiar way, and which will increase in hardness with age; it possesses advantages over similar articles made of clay, as it does not warp or twist, and the inverts can be made in 12 feet lengths, and the smaller size pipes in 4 feet lengths, they have also loose covers, so that they can be readily

examined at any time. The prices are as follows:

3 inches bore.....	3d. per foot.
3 " " " " " " " "	4d. " "
6 " " " " " " " "	11d. " "
10 " " " " " " " "	1s. 4d. " "

Sewer in blocks, 4 feet by 2 feet 6 in., 8s. per foot. Blocks for inverts, 2s. per foot lineal.

The tubular system of sewers as a whole is not generally adapted for towns, it may suit small towns, or small collateral streets of large ones, but they have not yet been manufactured large enough to be suitable as main drains for the drainage of large areas.

The sizes of sewers must depend entirely upon the area to be drained and the fall or declivity to be obtained to the point of discharge, and at the same time, they should be large enough not only for house drainage, rain and stone water, but an allowance should be made for extraordinary storms. It has been the custom with all our eminent hydraulic engineers not to apportion their hydraulic or other works to the bare minimum duty they have to perform, but to make due allowance for any unforeseen contingencies.

This has been strongly confirmed by the report on the city of London above alluded to, in which it is stated that sewers should be large enough to admit a man for the purpose of repair or to remove deposit, and that the size for the main sewers should be 5 feet by 3 feet, and secondary sizes 3 feet by 2 feet. They further state that the air of small sewers is worse than large ones, and that no evil effect can be apprehended from well constructed brick sewers with a good fall and well cleansed, and they act as under drains for the surrounding earth, which the entire substitution of earthenware pipes with tight joints, would practically prevent.

Sewers with an inclination of 1 in 250 will keep themselves clean, without the aid of flashing; but when the inclinations exceed that, a system of flashing is indispensable to prevent deposit. But I consider in every case an occasional cleansing of the sewers, where a current of water cannot be obtained to pass through them, beneficial, as it tends to sweeten and purify them, and is the means of removing the causes of noxious exhalations.

The form of sewer I have adopted is one approximating to the egg shape (the true egg form not having yet been correctly developed for sewerage purposes) the arch is semi-circular, and the invert a series of segments. It departs as little as possible from the strong and advantageous form of the circle, (which is the figure of greatest capacity with equal circumference) while from placing the narrow end downwards, it concentrates the flow of the water over a smaller area, reduces the friction, and thereby adds materially to its capability of discharging fluids.

It is generally considered that the cylindrical is the strongest form that can be adopted for sewers; but there are other questions to be taken into calculation, as before stated, besides strength, viz: the best shape for the passage and discharge of fluids, and that is now generally admitted to be the egg shape.

I would strongly recommend for our future operations, the use of the Portland or lias cements for the inverts of our sewers, and blue lias lime for the arches, as no other material should be used than good hydraulic mortar in structures that are in any way exposed to the action of water, and where durability is desired.

The Portland and blue lias cement is cheaper than the Roman cement, as it will bear a greater proportion of sand, while its strength and durability is superior. Puzzolano or Terras are good hydraulic cements for sewers, though probably more expensive than those above stated. From experiments recently made, I find that smiths' ashes, or black oxide, adds very materially to the strength of hydraulic mortar, though it adds also a little to the expense. I think if arrangements could be made, it would be desirable to have the inverts of our sewers manufactured in blocks, say one foot or more wide, and two or three feet lengths, so as to have as few joints as possible in the inverts; and this might be further improved by having the interior surface glazed. I have made inquiries from various manufacturers, and they state there would be difficulty in making them. Again, it may be a question whether or not a smoother invert may be

formed by rendering the interior surface of the brickwork over with cement, as is the practice of some eminent architects.

The same objection applies to the formation of the inverts of our sewers in the rock, as to the dry brickwork alluded to above—the sewage will be certain to percolate through the fissures in the rock. The inverts of sewers should invariably be made impervious to moisture.

Ventilation of Sewers.—Much of the offensive gas that now escapes from our sewers, might be prevented by trapping the openings effectually, and by connecting air shafts or flues with the sewers, or the walls of the highest houses on the summit levels, so that the foul air may be sent in the atmosphere, and dispersed where it could not possibly be injurious or offensive. This is a plan I proposed two years ago, it is very simple in its nature, and would, I think, prove effective.*

In London they are trying experiments to burn the gases by placing fires on gratings over openings in the sewers made for that purpose; from which it is proposed, I believe, to carry large chimney shafts to convey away the smoke and effluvia: but this is an expensive operation.

To be continued.

English Patents.

Railway Axles and Wheels.

William Kilner, of Sheffield, engraver, for "certain improvements in manufacturing railway and other axles and wheels; and in machinery to be employed in such manufacture."

1. The inside surface of the tyre, after being bent into a circle, is raised to a welding heat, by placing it into a hollow fire or closed hearth, after which it is laid on a block, and the spokes, previously heated at one end, are successively welded to it. The nave is composed of two half-naves formed of bar iron coiled into rings, with the internal hollow of less diameter at one end than the other; and the inner ends of the spokes are arranged on the face (with the smallest bore) of one of the half-naves, and the corresponding face of the other half-nave laid on them. Care is taken to leave a space between each pair of spokes, and to punch holes in them, in order that the inside surfaces of the half-naves may be welded together at these points. The nave and spokes are heated to the welding point by being placed above the fuel in a furnace, the top of which is made moveable for the purpose of admitting the wheel, after which they are welded together by swages, and the small ends of the half-naves welded over the ends of the spokes. Or two chams united by a right and left hand screw-coupling, and passing through the centre of the wheel, are attached to the opposite sides. The wheel is placed in a projecting hearth above the fuel, and when heated to the proper degree of temperature, the chain is tightened and the wheel formed. Instead of welding the spokes to the tyre after the latter has been bent into a circle, they may be welded to a straight bar of iron, which is then bent to the required shape around the ends of moveable blocks arranged to form part of a circle, with intervening spaces to receive the spokes.

2. To give the necessary rotundity to the tyre, a bed plate is employed which has a central vertical shaft, on which the wheel is placed, and is free to revolve thereon. Around the rim are two pairs of equidistant rollers, supported on spindles in the ends of four levers, the other extremities of which encircle two screw rods, whereby they can be made to approach or recede from the tyre, while above and beneath it are two other rollers, capable of being brought closer together. The rollers are driven by toothed gearing from any prime mover, and communicate their motion to the wheel. The felloe is formed with a dovetail, and the edge of the tyre bent over it by the action of the rollers. An adjustable scraper is made to act against the tyre, for the purpose of cleansing it.

3. For the purpose of turning the tyres the patentee employs revolving circular cutters keyed on a shaft, resting on moveable bearings, which can

* This system of ventilation is vicious in principle; by it the air we breathe would become contaminated. By the action of the wind, the upper stratum of air becomes intermingled with the lower stratum.—Ed. C. E. & A. Journal.

be made to slide up and down simultaneously by means of a hand screw.

The axles are constructed of two tubes, placed one within the other, or of a tube filled with bar iron, and welded at the ends only, or of a number of bars of iron, curved and overlapping one another, to give a spiral direction to the fibre.

Claims.—1. The use of the hollow fire or closed hearth for heating tyres to the welding point.—2. The projecting hearth.—3. Heating the inside surface of the tyre, by causing the flame and products of combustion to impinge against it, instead of by radiation.—4. Heating the spokes and tyre together, in order that they may be welded at the same heat; and arranging the spokes which have holes punched in them, at a distance from each other, between two half-naves, to allow of the surfaces of the latter being welded together at these points, as well as over the ends of the spokes.—5. The employment of two or more rollers acting uniformly and capable of being caused to approach or recede from the tyre, in conjunction with the scraper, for the purpose of rolling and cleansing it.—6. Boring and turning the inside and outside surfaces of railway wheels by revolving circular cutters.—7. The compound hollow axle.—8. The railway axle, composed of a tube filled with bar iron welded only at the ends.—9. The railway axle, with the bars of iron laid so as to give a spiral direction to the fibre.

—C. E. & A. Jour.

Improvements in Steam Boilers.

Among the entries of papers to be read in the mechanical section at the late Birmingham meeting, was one on "Wright's Steam Generator;" but owing to some mismanagement, the subject never came before the section. We have since received particulars of the scheme, which we may here explain:—The principle upon which it is founded, is the circulation of a small portion of highly-heated water through tubes, in communication with the great mass in the boiler. The peculiar construction of the entire apparatus will be best understood by first considering only one portion of it, that called the "cellular plate." If we imagine two sheets of corrugated iron, measuring about 2 feet by 6 feet, with the corrugations the short way of the plates, it is evident that, on laying these together, we should have a series of short open tubes, each connected by a narrow rib of metal. If we were now to take two tubes, each 6 feet in length, or rather larger bore than the 2 feet tubes, and had one row of apertures made in each, corresponding with the ends of the short tubes formed by the corrugated plates, these, if they could be welded to such apertures, would form one entire plate of connected tubes, with no other external openings than the four ends of the two longitudinal 6 feet tubes. This arrangement, though it would be a matter of some difficulty and expense to accomplish in wrought iron, is easily made in malleable cast iron. A wagon boiler has been fitted up at the manufacturer's establishment, 143 Great Suffolk street, London, for experimental purposes. Two of the cellular plates just described are placed within the boiler, a few inches from the bottom, and are connected by short elbow pipes passing through the ends of the boiler, with two corresponding cellular plates immediately underneath the bottom of the boiler, forming the crown of the furnace: the several connections are so arranged, that a continuous circuit is maintained throughout all the tubes, which are then filled with water, amounting to about 7 gallons in this instance. This apparatus being furnished with an expansion vessel and two safety valves, perfect security is obtained against explosion; and the temperature of this small quantity of water is, under this arrangement, readily got up to between 400 and 500 deg. Fah. In the experimental boiler and furnace under consideration, the boiler, though only 6 feet 9 inches long, 3 feet 6 inches wide, and 2 feet 6 inches deep, containing water only 9 inches deep in the centre, with two cellular plates immersed therein, measuring 6 feet and a half by 20 inches, and, under ordinary circumstances, only equal to a 4-horse power boiler, yet, such is its rapid steam-generating property in connection with the cellular plates, that steam sufficient is obtained for a 12-horse power engine. The furnace presents a grate surface of 4 feet square. The result of numerous experiments show, that upwards of 12 lbs.

of water are evaporated for every pound of coal, whereas, in common practice, 5 to 6 pounds of water per pound of fuel is considered an excellent performance; and, indeed, with locomotive boilers of most approved construction, employing the best coke, 7½ lbs. of water evaporated per pound of fuel is reckoned a good average duty. There is another consideration not unworthy of notice, that the furnace, with its two overarching cellular plates, full of oblong apertures in the metal connecting the short tubes, side by side, is peculiarly favorable for effecting the most intimate mixture between the air and the gases in the furnace, as well as in keeping up their temperature to that degree most favorable for their perfect combination and combustion, so absolutely requisite to prevent the evaporation of smoke; the consequence is, that a constantly bright flame may be observed playing along the boiler bottom, materially assisting the evaporation process.—*Prac. Mech. Jour.*

AVERAGE PRICE OF BAR IRON.

The subjoined statistics of the prices of bar iron are extracted from a paper on the iron trade, by Mr. John Barclay, which appeared in the *Mining Journal*:—

1813.....	£12 6 8	1827.....	£9 7 6
1814.....	13 18 4	1828.....	7 18 4
1815.....	13 13 4	1829.....	6 16 8
1816.....	12 2 6	1830.....	6 3 9
1817.....	10 12 6	1831.....	5 13 9
1818.....	12 1 8	1832.....	5 13 4
1819.....	12 5 0	1833.....	6 12 11
1820.....	10 13 4	1834.....	6 18 9
1821.....	8 18 4	1835.....	6 10 0
1822.....	8 1 3	1836.....	10 12 6
1823.....	8 0 0	1837.....	9 1 3
1824.....	8 19 2	1838.....	9 4 7
1825.....	12 14 2	1839.....	9 15 0
1826.....	9 15 10		
Rails.....	5s. to 7s. 6d. extra to prices of bars		
Sheets.....	40s. ditto.		
Angle iron..	30s. ditto.		
Hoops.....	40s. ditto.		
Best iron..	25s. to 30s. per ton extra.		

GOV. JAMES C. JONES.

This most gifted and eloquent son of Tennessee, although not mingling in the strife of party politics, and holding only the station of "high private" in the ranks of the people, is doing more than a yeoman's service in a great and glorious cause—a cause which will one day place his name along side that of De Witt Clinton. We allude of course to the cause of internal improvements. As agent for the Nashville and Chattanooga railroad he accomplished more to secure the subscription of the capital stock, and thereby secure the certain completion of the road, than any man in Tennessee; and the great mass of the people will honor him in coming time, as the champion who first gave that great work its impetus, and insured its early and successful completion.

We have been led into these remarks from noticing, in the *Holly Springs (Miss.) Gazette* of the 28th ult., a notice that Gov. Jones will visit that place and address the citizens of Marshall county and North-Mississippi, upon the subject of the Memphis and Charleston railroad, on Monday, 22d April.

The fame of the orator is sufficient to command an audience as large as the most ambitious man can desire to address.—*Weekly Review.*

ENGLISH RAILWAYS.

It appears from a return just issued that the total number of persons employed upon railways open for traffic on the 30th June, 1849, was 55,968, and the length of railway 5,447½ being at the rate of 10·3 persons per mile. There were at that date employed on these lines 156 secretaries and managers, 32 treasurers, 107 engineers, 314 superintendents, 120 storekeepers, 138 accountants and cashiers, 490 inspectors and timekeepers, 1,300 station masters, 103 draughtsmen, 4,021 clerks, 709 foremen, 1,839 engine drivers, 1,871 assistant engine drivers and firemen, 1,631 guards and breaksmen, 1,510 switchmen, 1,361 gatekeepers, 1,508 policemen or watchmen, 8,238 porters and messengers, 5,508 platelayers, 10,809 artificers, 14,029 laborers, and 144 in miscellaneous employment. The total

persons employed upon railways authorised, but not open for traffic, on the 30th of June, 1846, was 103,816, the total length in course of construction being 1,504½ miles, and that of railways neither open nor in course of construction, 5,132½ miles; together 6,636½ miles. The number of secretaries and managers employed on these lines at the above date was 142; treasurers, 7; engineers, 269; superintendents, 419; storekeepers, 182; accountants and cashiers, 144; inspectors and time keepers, 821; draughtsmen, 153; clerks, 421; foremen, 1,421; policemen or watchmen, 481; porters and messengers, 118; artificers, 16,144; laborers, 83,052; and miscellaneous, 42. The total length of railway authorised on 30th June, 1849, was 12,083½ miles; and the total number of persons employed thereon, 159,784.

Alabama.

Mobile and Ohio Railroad.

We have received the report of the proceedings of the second annual meeting of the stockholders of this company, held at Mobile on the 5th of February last. Since the last annual report, preliminary surveys of the route have been completed to the mouth of the Ohio. In August last about 8 miles of heavy work, commencing about 25 miles from Mobile, were put under contract, and in December conditional contracts were made for the grading, etc. of the remainder of the first division of the road, extending from Mobile to Buckatunna, a distance of 70 miles.

The final execution of these contracts was to depend upon the means of the company. As these now are sufficient to justify their completion, we presume that they have been made absolute. When the project of constructing the above road was started, very liberal subscriptions, amounting to about 700,000 dollars, were made to the work, mostly in Mobile. This subscription rendered those making it absolutely liable for only 20 per cent of the amount subscribed. The directors of the road being unwilling to put the work under contract upon such security for means to prosecute it, a new subscription was called for absolute in its terms;—and at the time of the annual meeting these new subscriptions reached the sum of \$268,000. This amount it was estimated would be increased at least \$200,000 by persons who had not made their subscriptions absolute. This would make the available means of the company as follows:

Individual subscriptions.....	\$268,000
Estimated ".....	200,000
City of Mobile subscription (since made).....	300,000
	\$768,000

The following is the estimated cost of the first division:

Grading, masonry and bridging.....	\$108,000
Thirty-three miles superstructure and three miles street tracks and sidings..	250,000
Machinery and cars.....	45,000
Repair shops at Mobile....	20,000
Engineering Department...	11,200
Contingencies.....	20,000—\$454,200
Amount estimated for present engagements from Feb. 1, 1850, to Feb. 1, 1851:—	
To complete Riddle's contract.....	66,000
Engineering Department...	4,800
Contingencies.....	6,000— 76,800
Total for 33 miles including Riddle's contract, with equipment in working order.....	\$531,000

Estimated wants for road bed beyond Riddle's contract, to Buckatunna to be completed the 2d year, are for

Grading, masonry and bridging section 24 to 40, inclusive.....	\$249,140
Engineering department.....	16,000
Contingencies.....	10,000—\$275,140
Estimated wants to complete the upper sections, 3d year:	
37 miles superstructure and 2 miles sidings.....	273,000
Machinery and Cars.....	55,000
Addition to repair shops.....	10,000
Engineering department.....	8,000
Contingencies.....	12,000—\$358,000
Postponed payments and future general expenses....	35,860

Total in working order to Buckatunna, 70 miles.... \$1,200,000

Leaving a deficiency of \$432,000 to be provided for.

The following is the estimated cost of the whole work:

Alabama Division.

Mobile to Buckatunna river in complete working order.....69.6 miles....\$1,200,000

Buckatunna river to Kemper county line complete as above.....94.6 miles.... 1,861,795

Total for Alabama division.....164.2.....\$3,061,795

Mississippi Division.

Kemper county line to south boundary Tennessee, as above..... 176 miles...\$3,199,911

Part of branch to Tennessee river, in Miss..... 15 miles... 249,372

Total for Mississippi division..... 191 \$3,449,283

Tennessee Division.

South boundary of Tennessee to south boundary of Kentucky..... 119½ miles...\$2,053,621

Remainder of branch to the Tennessee river..... 8 miles.. 186,641

Total for Tennessee division.....127½ miles...\$2,240,262

Kentucky Division.

From Tennessee line to Ohio river..... 39½ miles.. \$949,240

Making a total expenditure from Mobile to the Ohio river, to complete and equip the road, (including branch to Tennessee river, 23 miles,) for.....521.8 miles...\$9,700,580

In reference to the ability of the section of the country interested in this road to construct it, the directors say:

By this distribution of the cost, it will be seen that the proportion devolving upon Alabama to construct is only 164.2 miles, requiring \$3,061,795 to complete, with machinery, &c., in full operation. Although this great work, taken as a whole, may seem, to some, an enterprise too formidable for individual effort—yet when the fact is considered, that the energies of four wealthy and populous States will be directed to its consummation, and that the amount which any one state will be called upon to contribute for the purpose, is not more than one third the sum which the single state of Georgia has already invested in railway improvements—the Mobile and Ohio railroad presents no difficulties that should deter an energetic people from undertaking its accomplishment.

With the design, not so much to obtain present state aid, as to call the attention of the people of Alabama, through the Legislature, to a basis for future action—a memorial was prepared, and has been presented to the Senate, setting forth a plan by which the state can extend efficient aid to the great works of internal improvement within her

borders, without involving herself in any liability, for which she will not hold ample and profitable security. The necessity of state action in behalf of these objects is becoming every day more apparent, and public opinion is rapidly ripening in its favor, so that there are strong reasons for believing that the next Legislature will be prepared to grant to this company the assistance desired to complete the road from Buckatunna river the Kemper county line.

A similar memorial is now before the Legislature of Mississippi, and assurances are given by members of that body, that a liberal portion of the internal improvement fund will be appropriated towards the extension of the work through that state.

A bill has also been introduced into the U. States Senate, donating to this company the alternate sections of public lands, twelve sections in width upon the line of the road. All the information in the possession of the board is favorable to the passage of this bill.

In reference to the general route to be adopted, we copy the following from the report of the Chief Engineer:

Of the two grand routes proposed at the last annual meeting, the eastern one has proved the best, passing from the valley of Chickasawha through Lauderdale, Kemper, Noxubee, Lowndes, Monroe, Itawamba and Tishamingo counties, Mississippi; McNairy, Madison, Gibson and Obion counties, Tennessee; Fulton, Hickman and Ballard counties, Kentucky. The preference is awarded to this route because it is more direct in its course to the north; passes through the most fertile sections of Mississippi; intersects the Tennessee river and North Alabama trade in its course; and thence passes more centrally and favorably through Western Tennessee and Kentucky.

A glance at a map of the United States is a sufficient illustration of the importance of this work. By the route proposed, the distance from the mouth of the Ohio to the Gulf of Mexico is less by one-half than the distance from the same point to New Orleans. It would, in connection with the proposed roads in Illinois, bring Lake Michigan within 900 miles of Mobile, thus bringing the products of the tropics and those of the north within easy reach of each other. In this country the natural course of trade is at right angles with the parallels of latitude; the products of the south seeking their market in the north, and those of the north finding their appropriate market in the south. The country penetrated by the line is one of the most fertile in the Union, and for the most part very healthy. All the conditions, therefore, are here present to warrant the construction of the work; and the only argument against it is the vastness of the undertaking. But the surest way to success is to commence and push forward with what means are at hand.—Means will develop themselves as the work will progress; and counties and States interested in its construction will lend their credit to its aid. We presume that the strength along its line is sufficient to prepare the road for the rails. If such is the case there will be no insuperable difficulty in procuring the iron and necessary equipment. If a western road can do this, success is considered certain. It finds but little difficulty in negotiating securities in this market, and at not very exorbitant rates, for rails, engines, &c.

This road if constructed would be national in its influences and benefits. It is necessary to give symmetry to the great system of railroads which is so fast spreading itself over the country. This system requires one great arm resting upon the Gulf of Mexico to maintain its communication with that quarter. Mobile has a vast interest in the success of this work, as it would give her a conspicuous place among the leading cities of the Union.

The following constitutes the list of directors for the present year:

SIDNEY SMITH, Pres't.
Francis B. Clark, Charles LeBaron,
David Stodder, John Bloodgood,
George N. Stewart, Charles Gascoigne,
J. Emanuel, John A. Campbell,
Moses Waring, J. M. Cunningham, Miss.
J. W. Cambell, Ten. B. E. Gray, Ky.

Ohio.

Bellefontaine and Indiana Railroad.

We have received the report of the preliminary surveys of this road, by W. Milnor Roberts, Esq., chief engineer, illustrated by an elegant map showing its connections with the roads running west from all the great Atlantic cities. We have frequently spoken of this road as one of the important links in the great line of railroad from Philadelphia to St. Louis. This however is destined to form a part of all the lines of railway running from Boston, New York and Baltimore, as these will make a common point at or near the eastern terminus of the Bellefontaine and Indiana road. All the eastern cities have a similar interest in the construction of the last named road, because all must pass over it on their way to St. Louis. It strikes the eye more conspicuously as a part of the line from Philadelphia, as the various roads now in progress from that city to the Mississippi form a remarkably direct route—much more so than from any other eastern city—and will form, when completed, one of the grandest lines of railroad in the world. By this line the distance from Philadelphia to St. Louis will be 981 miles, made up as follows:

Pennsylvania Central railroad..... 356
Ohio and Pennsylvania railroad..... 180
Bellefontaine and Indiana railroad..... 120
Indianapolis and Bellefontaine railroad..... 83
Terre Haute and Indianapolis railroad..... 72
From Terre Haute to St. Louis..... 170

981

From Baltimore to Pittsburgh is 323 miles, consequently Baltimore by this route is 948 miles from St. Louis. From the eastern terminus of the Bellefontaine and Indiana railroad to New York, via Dunkirk and the New York and Erie railroad, it is 697 miles, making the distance from New York to the Mississippi river, by the above route, 1142 miles, and from Boston 1236 miles.

The route of the proposed road, like most others at the west, is very favorable to railroad construction. In relation to the characteristics of the road we copy from the report as follows:

1st. Its directness: in obtaining an easily practicable line throughout, it has not been found necessary to increase the length between the points fixed in the charter, very materially over the air line distances. The principal increase occurs between Marion and Bellefontaine. The total increase on the whole route will not exceed about five miles; in this respect comparing most favorably with any railroad of similar extent with which I am familiar.

2d. The grades are more favorable than those on either link of the same great railroad chain eastward of your line. The maximum being 39.6 feet per mile, and the longest grade of this character being only about 2½ miles. In 120 miles, 93 miles are either level or with grades under 27 feet per mile. The grades taking the average on the whole route will be about 18½ feet per mile.

3d. Its curvature: In this important feature the plan of your road will be admirable. In 120 miles there will be but 9 miles of curved road, leaving 111 miles of straight line, and nearly all the curves may be described with radii of 3000 feet or more, which for practical purposes will make nearly the whole road equivalent to a straight line. Among the straight lines there are one of 30, one of 20, one of 17, and two of 8 miles in length.

4th. The whole amount of work is small; and

the easy nature of the excavations is an important recommendation. Except on a portion of the Zanesville route—in case that should be adopted—there will be no rock or slate excavations. They will consist of earth and gravel, which on a large portion of the line may be cheaply removed. The total length of bridges required on the route will be about 1100 feet, or an average of less than 10 ft. to a mile; and the longest single bridge need not exceed 250 feet of water way.

With such facilities for construction the engineer estimates the whole cost of a first class road, not including the equipment, at \$12,000 per mile: making the whole cost \$1,440,000. The cost of grading, bridging, etc., is estimated at \$4,000 per mile. It is believed that this can be raised by private subscription, leaving the iron and equipment to be purchased by the bonds of the road, and the securities of the towns and counties on its line.—The president of the road, James H. Godman, Esq., we understand is now in this city for the purpose of negotiating some of these securities.

It may be proper to state here by way of explanation that the above road is not very appropriately designated by its title, which conveys an indefinite and rather erroneous idea of its locality. It is entirely an *Ohio* company, and was named at a time when its limits terminated at Bellefontaine, a distance of about 58 miles from the Indiana State line. Its chartered rights were afterwards extended as far as Mansfield, the capital of Richland county, tho' its eastern terminus will probably be fixed at some point on the Cleveland, Columbus and Cincinnati railroad.

The town of Bellefontaine is actually in the *middle*—the half-way station of the road, instead of being at either extremity, as would commonly be supposed.

The name Bellefontaine is almost as inappropriately employed to designate the *Indiana* road extending from Indianapolis to the Ohio line, 83 miles. That is called the *Indianapolis and Bellefontaine* railroad, when it does not reach within 58 miles of the latter town.

With regard to the business prospects of this road we will merely add our opinion, which we have so often expressed, that every road in the west, thro' a well settled district, if well constructed a properly managed, will be sure to yield a liberal income. They can there be constructed very cheaply, and must have a very large amount of business. The above road, running through one of the best portions of Ohio, must enjoy a large local traffic, and being a part of a great line, between the Atlantic and the Mississippi, its through business must be enormous. The construction of the Cleveland and Columbus will bring this road into use as fast as the several portions are completed, and this will give immediate means to meet the interest on such indebtedness as it may incur.

MANUFACTURES AT THE SOUTH.

The Savannah Republican estimates that there are in operation in Georgia 40 cotton mills, employing near 60,000 spindles, and consuming 25,000 bales of cotton annually. In this estimate, which seems to be below the true mark, no calculation is made of our paper mills, bucket factories, iron establishments, flouring mills, etc. In Tennessee it been reported to the Secretary of the Treasury that there are 30 factories, employing 36,000 spindles. In South Carolina, the Hon. William Gregg says there are 16 factories, containing 36,500 spindles and about 700 looms, consuming 15,000 bales of cotton per annum. He estimates the capital invested in these establishments at about one million

of dollars, and the number of operatives they give employment to at 1,600. There are in Alabama 12 factories, with a capital of \$500,000, containing 12,000 spindles, and 300 looms, and consuming about 5,500 bales of cotton annually. It is said that machinery for others is contracted for, sufficient to make the number of spindles 20,000, and the looms 550. Thus we have in four States ninety-eight manufactories of various descriptions of cotton goods, containing 140,000 spindles. There are doubtless many other cotton mills in the other Southern States, which would swell the number.—In addition to these, there are others going up, not only in this State, but everywhere else in the south. We hazard but little in saying, that at the end of next five years there will be perhaps two hundred cotton factories in operation in the Southern States consuming near two hundred and fifty thousand bales of cotton per annum, and giving employment to twenty-five or thirty thousand operatives. The effect of such a diversion of labor upon the productions of the south, the price of cotton and the habits of those will likely be employed as operatives must be immense. All the cost of the transportation of the raw material to England, of its manufacture there, and its transportation back to this country, will be saved to our people. The general price of cotton will be increased by the competition which will ensue between the manufacturing establishments of Europe and the Northern and Southern State; and great good to Society must result from the employment of thousands of persons, who are now consumers and not producers.

Pennsylvania.

The contracts on the Ohio and Pennsylvania railroad, between Pittsburgh and Beaver, have all been let. The Pittsburgh Gazette says:

Seldom has there been a more spirited competition for contracts on any public work, than at the letting of that portion of the Ohio and Pennsylvania railroad. The whole number of firms bidding was 129, some of them for all the sections. The gross number of single bids, counting a bid for a section as one bid, was about 1,400. Great competition existed among well known, experienced and good contractors. The board, in making the allotments, sought to let the work to good contractors, at low rates, which, from the great variety of bids, they found but little difficulty in doing; many of the bidders offered to take 10 per cent. in stock of the Company.

Iron Manufacture in Michigan.

Detroit, Mich., May 4, 1850.

MR. EDITOR—As the readers of your very valuable and widely-circulated paper are practical business men, and as there is at present a vast amount of capital laying idle in our chief commercial cities, which would gladly seek a profitable investment, I propose to show that a more judicious expenditure of money cannot be made than the erecting of *iron rolling mills* in the city of Detroit, in the new State of Michigan.

It may not be generally known, but such is nevertheless the fact, that the iron mines of Lake Superior in this State yield a greater amount of *rock ore*, of a purer quality, than any portion of the American Continent. This ore, which is found in knobs or hills, about one hundred miles from the foot of the Lake, and fourteen miles from its southern shore, is incalculable in quantity. Many of these hills are from two to three hundred feet in height, one mile in length, by a half a mile in width.

The quality of the iron produced from the ore is second to none found in the world. It has been

thoroughly tried in New York, Boston, Pittsburgh and this city; and in every instance the preference is given to it over Sweeds or old sable Russia. A company, with a small amount of capital, has been at work at the mines about two years, and has produced between two and three hundred tons of bar iron. Another company has been in successful operation for the past year in transporting the ore to the lake shore, where it is manufactured into what are known as "blooms." This company are now working eighty men; and will have ten forge fires in full blast by the first of July next. The amount of "bloom iron" produced during the year 1850 will not be less than fifteen hundred tons. When it is recollected that this is the first year's operation of only one company, you will agree with me when I say it is immense.

I now come to the object of this article. There is not a rolling mill north or west of Pittsburgh.—The States of Michigan, Wisconsin, Northern Ohio, Indiana and Illinois use a goodly quantity of iron. The city of Detroit alone imported 2,483 tons of iron, and 12,300 kegs of nails in 1849, and what is Detroit compared with the amount used by the States above mentioned?

The Lake Superior mines will in 1851 turn out a sufficient quantity of iron for all of them, if we can induce capitalists to come among us and erect the necessary machinery to put the iron into the suitable shape for consumption. Detroit is situated on the largest and most commodious harbor in the interior of the United States. Its geographical position is inferior to none; being midway between east, west, north and south, with which she is connected by canals, rivers and lakes; consequently she can command the most profitable markets for her products. If New York and Boston will not pay her as well as St. Louis and New Orleans, she can avail herself of the latter places by means of water communication the whole distance, and at prices that quite compete with transportation eastward.*

Fuel is abundant and cheap; labor, food and clothing are also cheap; and what, I ask, with all these advantages, (which no human being can gainsay,) is to prevent the most profitable return from an outlay of capital, when it is recollected that in the city of Pittsburgh, in the interior of Pennsylvania every man has been made almost independently rich who has for the last 15 years been engaged in just such operations as the one here contemplated.—There is to my mind not the least shadow of a doubt, but that that man, or set of men, who first establish themselves in the manufacture of iron and nails alone at this point, will in a very short period of time, double, if not treble their investment. My reason for arriving at this conclusion is, that, as I said before, the quality of the metal is superior to any produced on this continent. When this fact shall have become generally known, Pennsylvania herself will be one of our customers. Already our mechanics are (having had a taste for it as it were) looking forward anxiously for the day when they can be furnished with it; for, to use their own language, they "prefer it to any they have heretofore worked."

The Michigan Central railroad company, which uses no inconsiderable quantity, invariably reserves this iron for those parts about their locomotives and cars where great strength and tenacity are required.

* The price of freight to New York is \$9; Cincinnati, \$6; St. Louis, \$6 50.

Captain E. B. Ward, so well known as the owner of the railroad line of steamers on the north shore of Lake Erie, gave directions to his workmen, when they were about to replace a broken working beam on the Steamer Samuel Ward, to use none other than Lake Superior iron in making the strap or band. Innumerable testimonials could be produced if necessary, to prove the very extraordinary quality of this metal; but as it has never as yet been questioned, I will not occupy your attention in detailing them.

If the manufacture of iron at Pittsburgh out of the ordinary bog ore has been, and continues to be, so profitable, what cannot be done with this rock ore? It is also peculiarly adapted to the manufacture of steel. I have known a knife, that was made of it, perform the most delicate operation that would be assigned to one of Wade and Butcher's best razors; and this knife was made in a simple blacksmith's forge with a charcoal fire.

Will not some of your New England patrons, who, of all men in the country, are the most enterprising, favor us with a visit during the coming summer, and give this subject a little investigation? If I can only get them to take one trip to the iron hills on the lake, and then spend a few days with us in gathering statistics, I am quite sure that no other argument will be necessary to get them to embark in the enterprise. DETROIT.

Tennessee

Nashville and Chattanooga Railroad.—We copy the following from the Nashville True Whig of recent date:—

Four thousand tons of iron for the Nashville and Chattanooga railroad have already arrived at New Orleans, and about 1,600 tons have been shipped to this city. The company will commence laying down the rails from Nashville towards Murfreesboro in June or July, and in December at Chattanooga, so as to meet near the middle of the line.

We are rejoiced to learn that companies are now about to be organized to build a railroad from this city to Columbia, and in the opposite direction to Bowlinggreen, Ky. Men of the requisite enterprise and ability are taking hold of the work, and we have good reason to believe that both lines will be speedily constructed. This is "going ahead" in the right way.

IRON MANUFACTURE IN PITTSBURGH.

The Pittsburgh Board of Trade, in a circular recently issued by it, states that in that city and its immediate vicinity, there are now thirteen rolling mills, beside five others within the compass of fifty miles—the actual product of which is, say 70,000 tons pig metal; yielding, say, with the labor employed, about \$5,000 per annum. There are also sixty foundries and engine shops, consuming some 20,000 tons more pig metal, and yielding with the labor employed, about \$2,000,000. With a great many glass, there are also six large cotton factories, together with other kinds of manufacturing establishments in this city—producing articles of not less than \$5,000,000 more, which with, say 5,000,000 annually paid for labor in the establishments, will make \$10,000,000. The number of blast furnaces in Clarion, Venango, Mercer, Butler, and other counties in northern and western Pennsylvania, is now one hundred and fifty, sending to this market near about one hundred thousand tons of metal, and valued between two and three millions of dollars.

There is now annually exported from the counties of Westmoreland, Fayette and Washington, on the Monongahela Improvement, about 6,000,000 bushels of coal, producing in all about \$400,000. There are also about 12,000,000 bushels annually

consumed in our manufacturing establishments in this city and vicinity, valued at about half a million of dollars, and all dependent upon the Pittsburgh banks for their accommodations. To sum up the whole, the increase of business in all the various branches within the past ten years, has been not less than 300 per cent., and depends upon a banking capital of less than three millions of dollars, when in 1838, the banking capital and circulation was near eight millions, and not then considered as sufficient for the actual business of the place.

Pennsylvania.

Reading Railroad.

It will be seen by referring to the weekly statement of coal shipments, that the total amount of coal transported over the Reading railroad, from the 1st of December, 1849, to Thursday last, (May 2) a period of five months—is 357,056 tons, being an excess of 115,177 tons over the shipments during the same period last year. It is worthy of remark and commendation, and we presume the announcement of the fact will prove highly acceptable to the bond and stockholders of the company, that while the business of the Reading railroad this year shows a large increase over that of last year, the expenditures have been greatly decreased.

The affairs of the company were never in better hands than they are at this moment. The President, John Tucker, Esq., is a gentleman of enlarged views and the most thorough business qualifications, which he is turning to the best account in advancing the interests of the company. Of the superintendent, G. A. Nicolls, Esq., it is enough to say that he has held his present responsible station from the time the road was first opened, and given satisfaction throughout. Although the business of the road has increased in an astonishing ratio, he has been found fully equal to meet and direct its operations so as to yield the largest return, with the least possible expense. This has been effected by the introduction of a perfect system in every department. Every employee on the road knows his duty, and is severely censured, and very often dismissed, for neglect of it. Every train has its appointed hours of starting and stopping, and is required to perform its trips within a given time, so as not to interfere with others. By the aid of the telegraph, the principal officers of the road enjoy a sort of ubiquity throughout the entire length of the line. All detentions, accidents or mishaps are promptly reported over the wires, and directions as promptly returned how to act in the premises. It is this that enables the road to do so enormous an amount of business—and yield so rich a return to the stockholders.

In the workshops of Reading a similarly well ordered system, and the most rigid economy, obtains. Mr. James Millholland, who has this important department under his charge, is peculiarly fitted for the station. Possessing a thorough knowledge of mechanical science, added to much practical experience, he is enabled to direct the operations so as to conduce to the best interests of the company.—The first mechanical talent is employed and well and promptly paid for. Every man is expected to have a thorough knowledge of the peculiar branch for which he is engaged. All know their duty and are expected to attend to it. No drones, or inefficient hands are tolerated. The most approved kinds of machinery are used in the various shops—and everything is required to be kept in ample order. It is not surprising that this system of doing

business has effected the most gratifying results. In the workshops alone thousands of dollars are annually saved to the company, and the same may be said of every other department. The clerks are all men of character, honesty and worth—attentive to the performance of the duties devolving upon them. As in all well-ordered enterprises, merit is rewarded by preferment, while neglect or inattention is sure to meet with its reward.

A word as to the prospects of the road. They are truly gratifying. The company are confident, and with reason, of being able to declare a dividend of six per cent., this year, on the common stock. This was hitherto deemed impossible, but we confidently believe it will be done—and if effected this season, and during the comparative depression of the coal trade, we see no reason why it may not be done every succeeding year. Nor is it likely that they will stop at that—for should the business continue to increase, and the connecting roads now in contemplation be constructed, as there is good reason to believe they will be, the time is not far distant when the surplus proceeds, over and above a good dividend and the payment of the interest, will be sufficient to constitute a sinking fund for the gradual liquidation of the principal. We congratulate the company and friends of this great improvement, in view of these gratifying prospects.—*Reading Journal.*

ONEIDA LAKE IMPROVEMENT.

From the Oswego Commercial Times.

This new route from Oswego east to the Erie canal, through the Oneida river and lake, is now exciting great interest among the business men of this city. It promises well, and important results will probably grow out of it, as a new, more economical, and quicker route for freight from Oswego to the eastern markets. Mr. Littlejohn, an intelligent, energetic forwarder, of the firm of Fitzhugh & Co., of this city, has been through this entire route, and from him we have obtained some reliable details concerning it.

Oneida lake empties into the Oswego river at "Three River Point," about 18 miles from this city. The Oneida river is 19 miles long, and is broad, beautiful, and of great depth. It unites with the Oswego canal by two locks, and nine miles above the entrance, is the bridge which has obstructed navigation, and which has legally been removed, so that the steamer could pass with her tow of canal boats. At the entrance to the lake is Brewerton, where another bridge, with a draw is found. On this river between the lake and the canal, the "Oswego," a new and powerful steamer, is now placed for towing boats up and down the river.

Lake Oneida itself is 22 miles long, and is one of the most beautiful sheets of water in western New York. The steamer "Oneida" is placed there for towing, and her compliment of boats is twelve in a tow. She runs as far as Wood Creek, which is two miles in length. The boats then take the canal, which is about four miles before they reach Higginsville, where they enter the Erie canal.—The route by this lake and river is two miles shorter, but it is the circuitous character of the river portion of it, which renders it so extended. About ten miles are run to reach a distance of three miles in one instance.

One advantage of this route over the route through Syracuse and the Erie canal, is the saving of tolls and time. The time occupied between Higginsville and Oswego, will average between 24 and 36 hours, saving 12 to 24 hours in a trip. This, especially, in the spring and autumn, when the Erie canal is crowded with boats, will probably be materially increased. In regard to the economy of the route, it is estimated that about \$30 in tolls may be saved on each trip, on full cargoes of merchandise up and flour down. There are small tolls to be paid on the canal portion of the route, and also for towing, but the saving in the aggregate during the year must reach some thousands of dollars to each for-

warding house. To avoid delays, it is also decided to add another steamer to the lake, which will be ready in June. We understand the route will be perfectly arranged in a few days, and in point of safety, speed and economy, it will unquestionably be found vastly superior to the Syracuse route.

AMERICAN RAILROAD JOURNAL.

Saturday, May 11, 1850.

News from Europe.

The facilities of communication between this continent and Europe are now so great that the commercial affairs of this country are closely interwoven with those of the old world in every department of trade and business. The trade of this country is as much influenced by that of Great Britain as if she was only a different portion of this government, or at any rate, this is the case as far as the movements in the stock market are concerned. Four steamers arrived last week.

The CANADA brought the latest advices, from Liverpool to the 20th of April, and London dates to the evening of the 19th ult. We give such items as most directly affect the money market of this country:

BANK OF ENGLAND.

Issue Department.

Notes issued.....	£30,044,650
Government debt.....	11,015,100
Other securities.....	2,984,900
Gold coin and bullion.....	15,800,773
Silver bullion.....	243,877
	£30,044,650

Banking Department.

Proprietors' capital.....	14,553,000
Reserve.....	3,077,384
Public deposits (including exchequer savings banks, commissioners of national debt, and dividend accounts).....	4,914,388
Other deposits.....	10,969,389
Seven day and other bills.....	1,151,963
	£34,666,124
Government securities (including dead weight annuity).....	14,209,962
Other securities.....	9,744,702
Notes.....	9,997,075
Gold and Silver coin.....	714,385
	£34,666,124

M. MARSHALL, Chief Cashier.

April 12, 1850.

The market for English securities has again fluctuated to some extent, the prices of this day being rather below those of last week. To-day there was a rather more healthy tone to the market, and consols, for both money and account, closed with some steadiness at 95½ to 96; while the new 3½ per cents. were quoted at 97½ to 97¾, and exchequer bills 69 to 71 prem. for both large and small.

The following table shows the fluctuations in consols from April 15 to April 19:

April.	Lowest.	For Money.		Closing.
		Highest.		
Monday 15.....	95½	95½		95½
Tuesday, 16.....	95½	95½		95½
Wednesday, 17.....	95½	95½		95½
Thursday, 18.....	95½	95½		95½
Friday, 19.....	95½	96		96
April.	Lowest.	For account.		Closing.
		Highest.		
Monday, 15.....	95½	95½		95½
Tuesday, 16.....	95½	95½		95½
Wednesday, 17.....	95½	95½		95½
Thursday, 18.....	95½	95½		95½
Friday, 19.....	95½	96		96

The following quotations of American securities were the prices current the afternoon of the 19th:

	Interest.	Redeemable.	Price.
United States... 5 p. c. dollar.	1853	94 a 95	
Ditto..... 6 "	1862	105—106	
Ditto..... 6 "	1867	109—109½	
Ditto..... 6 "	1868	110—111	
N. York state... 5 "	1855	97½—98½	
Ditto..... 5 "	1858-60	97½—98½	
Ditto..... 6 "	1865	108—	
New York city... 5 "	1855-70	95—96	
Pennsylvania... 5 "		82½—83½	
Ohio..... 6 "	1856	98—	
Ditto..... 6 "	1860	100—101	
Massachusetts... 5 " sterg.	1868	105—106	
Illinois..... 6 "	1870	— — —	
South Carolina (Baring's).... 5 "	1858-68		
Do. (Palmer's).... 5 "	1866		
Maryland..... 5 " sterg.		90—91	
Miss. (Planter's Bank)..... 6 "	1841-70	60—	
Ditto. Union Bank..... 6 "		19—20	
Alabama..... 5 " dollar	1863	66—67	
Ditto..... 5 " sterg.	1858-9-66	72—74	
Virginia..... 5 "	1854	85—	
Ditto..... 6 "	1857-73	95—96	
Kentucky..... 6 "	1868	96—97	
Florida..... 6 "		30—	

The effect of the news was to advance stocks generally in the New York market.

The iron trade continues depressed, without disposition to sell at any material abatement in price. The following are the present quotations, delivered in Liverpool:—Merchant bar £5 2s. 6d.; best rolled £6 15s.; nailrod £6; hoop £7; sheet £7 15s.; No. 1 Scotch pig £2 12s.

The prices of cotton compared with those in '48 and '49 were as follows April 19th:—

	1850.	1849.	1848.
Bowed ordinary..... 6 a 6½	3½ a 4	3½ a 3½	
middling..... 6½ 6½	4½ 4½	3½ 4	
fair..... 6½ 6½	4½ 4½	4½ 4½	
good fair..... 7½ 7½	4½ 5	4½ 4½	
good..... 7½ 7½	5 5½	4½ 5	
Orleans and Mobile..			
ordinary..... 5½ 6½	3½ 4	3½ 3½	
middling..... 6½ 6½	4½ 4½	3½ 4	
fair..... 7½ 7½	4½ 4½	4½ 4½	
good fair..... 7½ 7½	5 5½	4½ 5	
good..... 7½ 7½	5½ 5½	5½ 5½	
ch'gin'd marks. 8 9	5½ 6½	6 7	
Surat			
ordinary..... 3½ 4	3 3½	2½ 3	
middling..... 4½ 4½	3½ 3½	3½ 3½	
fair..... 4½ 4½	3½ 3½	3½ 3½	
good fair..... 4½ 5	3½ 3½	3½ 3½	
good..... 5 5½	3½ 4	3½ 3½	
Sea I. st. & sawginn'd. 6 9½	4½ 7	4½ 8	
ordinary..... 10½ 11½	7½ 8	7½ 8	
middling..... 12 12½	8½ 9	9 9½	
fair..... 13 13½	9½ 10	10 10½	
good fair..... 14 15	10½ 11	11½ 12	
good and fine. 16 22	12 18	13 18	
Pernambuco..... 6½ 7½	5 6½	5½ 6½	
Demarara..... 6½ 7½	5½ 6½	5 6½	
Egyptian [ord to fair]. 6½ 7½	5½ 6½	5½ 6½	
Ditto [good fair to fine]. 7½ 9½	6½ 8	6½ 7½	
West India..... 6 8	4 7	4 7	

The following paragraphs from Wilmer & Smith's European Times on the cotton trade, are of interest as indicating the restlessness of the public mind of England in relation to the probable consequences of the future policy of this country, when we shall become the exporters of manufactured cotton in room of sending abroad, to so great an extent, the raw material.

"The law of supply and demand is the leverage which moves the commercial world. When an indispensable article of consumption becomes scarce, the value, as a natural consequence, rises in the market, just as it falls in value when there is a superabundance. Applying this incontrovertible fact to cotton, you would imagine, to hear certain sapient persons talk, that they desired a bill of indictment against the whole of the southern planters, because they cannot control the seasons, and

furnish abundance of the raw material for all the spindles in the world. These grumblers forget that the grower can no more regulate the price of cotton than he can mete out the sunshine which feeds, or the frost which kills the plant. The southerners engaged in the cultivation of the staple might justly retort upon the lords of Cottonopolis in the language of the ancient Briton—'If Cæsar can hide the sun with a blanket, and put the moon in his pocket, we'll pay tribute to him for light.'

"At the same time, when the equilibrium of prices has been destroyed by any unlooked-for casualty—when exclusive dependance upon a particular country for an essential article of commerce is found found to interfere with the legitimate course of capital and labor, it becomes not only necessary but imperative to look elsewhere for a supply fully equal to the requirements of the times, so as to be provided for every contingency; and in this spirit we can discern nothing to censure, but, on the contrary, much to commend in the pains which are now taken to procure a supply of cotton from other parts of the world, to compensate for the unquestionable deficiency of the American crop.

"Much has been said and written about the capabilities of India to send us as much cotton as we require, and to a certain degree of faith in the capacity of that country may be traced the anxiety with the public has watched the formation of Indian railways, and the eagerness with which their progress and completion have been regarded. The East India company has partaken largely of this feeling, and has extended a helping hand to two companies which have taken the field, and for which Acts of Parliament were passed in the last session. One of these companies will cut a line from Calcutta to Delhi; the other a line from Bombay to Kalliar, in the direction of the great cotton field of the Ghauts. These undertakings may be regarded as in practical operation, for the East India company has guaranteed a dividend on the outlay, which makes their completion a matter of certainty. A third line from Madras to Arcot is also projected: but whether it will struggle into existence is at present somewhat questionable. Nevertheless grave doubts exist whether the best internal communication in the world would enable India to grow cotton in quantities sufficient to affect the price in the home market. At present India grows little more than is required for its own consumption and the export trade to China; and as to quality it is impossible, under any circumstances, that the cotton of India can ever compete with the long staple of America.

"Port Natal is also mentioned with encouragement as a cotton growing district, but the smallness of the population, and the fact that no vessel has ever yet sailed from D'Urban, the only port in the colony, direct to England, shows that a long period must elapse ere its developments can produce tangible results.

"The most feasible scheme, of the many which have been broached, is one put forward by the owners of property in British Guiana. The West India Association, in their petitions to Parliament, as well as in their memorial to the Colonial Secretary, make out a strong case on behalf of the West Indies generally, and of Demerara more especially. The labor question is at the bottom of all our West Indian difficulties. Every plan adopted since the emancipation of the black population to secure a sufficiency of labor has failed, and the Association ask, through Mr. F. Shand, their chairman, permission to engage blacks on the coast of Africa on

the plan which the British factories on the river Bonny adopt with the natives of the Kroo coast—namely, to hire them, say for five years, at the expiration of which time they can return, if they desire it, to their native country. In the estimation of many persons, this would be equivalent to a renewal of the slave trade; but if similar arrangements were permitted in the case of the Coolies, and, in the one referred to—that of the Kroo blacks—we can see no sufficient reasons why precautions might not be taken on the African coast, as well as at Demerara, to protect the blacks who might willingly enter into these engagements, from the possibility of wrong or injury. To no higher practical end could the naval force which excites Mr. Hutt's antipathy be directed, and under judicious regulations the moral and physical condition of the laborers, instead of being deteriorated, would in reality be improved and elevated by the boon which the West India Association solicit at the hands of government and the country. If the experiment were tried in British Guiana, it might, if successful, be extended to the West India islands.

"In the meantime the southern planters of America, stimulated by the prices which now prevail, have every inducement to extend the cultivation of cotton with, if possible, increased power and capital. Probably the next crop may, in its amplitude, compensate for the shortness of the last one, and the outcry which now exists for other fields of cultivation in various quarters of the globe would, in the event of such a result correspondingly abate. But at the same time they will read the signs which are every day passing around them very imperfectly, if they do not perceive a fixed determination on the part of the merchants and manufacturers of this country and its government, to rely less exclusively than heretofore on the cotton of the United States. *Experientia docet.*"

With a wise system of protection to home industry, we believe the time is not far distant when we shall manufacture the major part of the cotton used in the United States. If the south should once embark her capital in this branch of industry, there is no limit that can yet be assigned to the extent of our wealth or our resources.

How we Purchase Iron for our Railroads.

In many parts of the country, in the west particularly, are our people engaged in the construction of railroads, who are exclusively occupied in agricultural pursuits, and who must purchase the iron for their roads by a sale of the products of their farms. Their only surplus consists in these articles, and consequently it is only by an exchange of them that they can procure such things as they stand in need of, and which they themselves do not produce. Consequently, so long as we import our iron from England, each section must obtain its supply by exchanging for it, its own appropriate productions. Take for instance the interior of Tennessee or Kentucky. Corn is one of the great staples of these States. We suppose that the average price of the crop of these States ranges from 12 to 20 cents per bushel. To export this corn to England costs from 50 to 75 cents per bushel; a sum four times at least as great as the cost of production. This cost of transportation comes directly out of the pocket of the producer. What is true of corn is equally true of all other agricultural products, though the cost of transportation may not bear so large a ratio to the value of the article.

The English manufacturer can afford to pay from 75 cents to one dollar per bushel for corn, and sell us iron at the low rate at which we are now buying

it. Now suppose that by some means the iron man and the western farmer could be placed side by side, and the iron manufacturer continued to pay in this country the same price he now pays in England for American flour and corn, how would the case stand then? Would our western people find any difficulty in purchasing any quantity of iron, so long as they could get 75 cents per bushel for their corn? At the present time, according to the doctrine of reciprocal free trade, the western farmer must or should supply the English manufacturer with the food for the support of his labor, at a cost many times greater than the cost of production. All paid for transportation is just so much absolutely lost, and might be saved if the producer and consumer occupied the same neighborhood.—We do not mean to say that corn would command in the west 75 cents per bushel, if iron manufacture should be extensively introduced there, because competition and ease of production would keep it below this point, but it would command perhaps twice its present price; and all other things being equal, the difference which the manufacturer should pay, over the price in England, would be so much additional profit. From this mode of reasoning, it is very easy to see why we can afford to pay more for iron of American manufacture than for the English article. In the former case we can sell direct to the manufacturer whatever we produce without any loss for transportation. In the latter case we must pay many times the cost of production, as the expenses of delivery of our products to the foreign consumer.

Now it is very certain that unless we commence the manufacture of rails our roads will bring us into commercial embarrassments. We are now sending abroad five millions dollars annually for the purchase of railroad bar alone. How much of this vast sum paid to the Englishman is made up of the expenses of transportation? How much is the real cost of production?

We were the more forcibly impressed with the importance of these views, in witnessing thro' the newspapers the efforts that the people of Northeastern Tennessee are making to construct a railroad from Knoxville to the Virginia State line, a distance something over 100 miles. The estimated cost of the projected work is \$2,000,000, for which they must mainly rely upon themselves. The route traversed by the proposed road is a comparatively isolated portion of the country, far removed from markets of all kinds, but possessing a most fertile soil, and vast quantities of coal and iron ore. Yet these people, if they can obtain sufficient means for their work, will go to England for their iron, and pay for it in corn at 12½ cents per bushel, while the manufacturer must pay six times that price.—Now is there not a great absurdity here? Would it not be better for these people to convert the products of their farms into iron manufactured at their own door, than to send it 4000 miles, at a vast expense, to undergo the same process? We think that there can be no doubt of it. There certainly can be none, unless it can be shown that iron can be manufactured in England cheaper than in this country, by the amount of the cost of transporting, both our agricultural products, and the iron itself.

The answer to this is, "we must purchase where we can buy cheapest." This is not the true rule to guide us. We should buy where we can pay easiest. Our ability to pay, and not the price of the article, should govern us. We have an abundance of everything required to support labor, but not money. Let our farmers buy their iron with what

their own farms produce, or what is the same thing, exchange the one for the other, at their own doors, rather than make the same exchange 4000 miles off subjected to the great expense attendant upon transportation.

What if the iron does cost more. From its superior quality it is worth 25 per cent. more. At the low prices we are now paying we get only the refuse of English iron. The English ask as much for their high priced iron as our own mills in this country. In proof of this we copy the following advertisement from one of our recent English railway exchange papers:

"Thornycroft's Patent Railway Axles, Rails and Railway Tyre.—Section No. 1, Half Size."

The middle, or wearing part of this tyre is composed of chrysaline charcoal iron, the hardest and soundest iron made. The outward edges are made from a mixture of India charcoal pig with the toughest fibrous iron—the whole made upon an improved principle into one homogeneous mass.

These charcoal tyres are warranted better and more durable than any tyres made in England.

Price £15 per ton net at the works, up to 3½ cwt. each.

Railway Tyre, Section No. 2, Half Size.

The middle, or wearing part of this tyre is composed of the best refined chrysaline puddled iron.—The outward edges are of the best No. 3 fibrous iron, and put together upon an improved principle into one homogeneous mass. The tyres are warranted quite equal to any made in Staffordshire.

Price £10 10s. per ton net at the works, up to 3 cwt. each.

Best Staffordshire Tyres £8 10s. per ton at the works, up to 3 cwt. each.

Patent Antilaminating Charcoal Rail.—Section No. 1, Half Size.

Price £10 per ton net at the works.

Patent Antilaminating Rails, made from the same quality as the best price £7 10 per ton net at the works.

The upper, or wearing part of these two sections of rails is made from antilaminating charcoal iron, much harder than any other iron, perfectly free from lamina. The under, or fibrous part from best No. 3 puddled iron.

Section No. 2, Half Size.

Price £10 per ton net at the works.

Patent Antilaminating Rails, made from the same quality as the best, price £7 10 per ton net at the works. Rails of the same sections are made from puddled iron, quite free from lamina in the wearing part, but soft and less durable than charcoal rails. The principle is applicable to any kind of rails."

The above is the advertisement of a leading English manufacturer, whose name is well known to our iron men. Is it not decisive evidence that it is for our interest to manufacture our own iron.

Machinery Oil.

WE the undersigned are now manufacturing an oil intended for the use of Railroads, Steamers and Manufacturing establishments. It has been in use several months and has given very general satisfaction. Our price is uniformly 70 cts. per gallon. Enquiries or orders attended to promptly. Address

ROBBINS, LANGDON & CO.,
133 Water street, corner Pine, New York.

CERTIFICATES.

Providence, March 22d, 1850.

Messrs. Robbins, Langdon & Co.,

Gentlemen: We have given your machine oil a thorough trial, and find that it possesses all the qualities that we could wish, as it works better than any sperm oil we have ever used. Our shafts that required oiling four times a day with the best sperm oil that we could get, work equally as well by the application of your oil twice a day, and your oil stands cold weather much better than any oil we have ever used. Our engineer having had years' experience in running and making engines, we put great confidence in his judgment, and he gives it as his opinion that your oil is fully equal to if not better than any he ever used; and we shall soon give you an order for more, as we do not want any other kind of oil as long as we can get yours.

Very respectfully yours,

JACKSON, CLARK & CO.

Steamer Bay State, Oct. 22d, 1849.

Messrs. Robbins, Langdon & Co.,

Gentlemen: In answer to your request for my testimony as to the machinery oil manufactured by you, I will say that I have used it for some time past on the Bay State, and am perfectly satisfied that your statement to me of its good qualities, is correct. As far as its lasting properties go, it wears equally long as sperm oil, runs perfectly free, and has no appearance of thickening. As seeing is better than hearing, I would recommend you to send your friends on board our boat, and they can then, by ocular demonstration, judge for themselves. Yours respectfully, JOHN GRAY,

Engineer of Steamer Bay State, Pier 3, N.R.

Steamboat Knickerbocker, Sept. 22, 1849.

Gentlemen: Mr. Hall, Agent of the Norwich and New London Steamboat Co., placed in my hands some of your machinery oil, which he desired me to use on the engine and other machinery, which I have done, and was so much pleased with the working, that I recommended the owners to give you their orders.

I have been using the article since August 19, and with perfect satisfaction, and I am well satisfied that your oil is as good as the best of sperm for lubricating machinery. I am yours very respectfully,

SAMUEL CARTER,

Engineer of Steamboat Knickerbocker, Pier 18, N.R.
To Messrs. Robbins, Langdon & Co.,
Oil Merchants, 133 Water street, New York.

Steamboat Worcester, N. York, Oct. 15, 1849.

Messrs. Robbins, Langdon & Co.,

Gentlemen: I beg to acknowledge the receipt of your letter requesting my opinion as to your oil for machinery, which I had not time to reply to previous to my return to Norwich. I have been using your oil on the engine and machinery of the Worcester with perfect success, and have much pleasure in testifying as to its good qualities. In my opinion, the journals keep cooler with your oil than with sperm, and it wears equally well. Should you at any time wish to refer to me as to your oil, I beg you will do so without hesitation. Yours respectfully, JAS. CROOKER,

Engineer Steamboat Worcester, Pier 18, N. R.

New York, August 3d, 1849.

Messrs. Robbins, Langdon & Co.,

Gentlemen: I received your letter in regard to your oil for machinery, which I handed to our engineer, and have much pleasure in sending you an extract from his letter to me on the subject: "I have applied the oil sent me upon our hot journals and cylinders, and find that they keep cooler with it than with sperm oil. I cannot find any fault with the oil, although I have watched it carefully. I have also tried it against an equal quantity of sperm oil, and find it wears quite as well." You are quite at liberty to show this extract to your friends, and shall be happy to give any further certificate you may require. WM. RIDER,

Treasurer Union India-rubber Co., 19 Nassau st. N. Y.

New York, March 22d, 1850.

Messrs. Robbins, Langdon & Co.,

Gentlemen: I have been using your machinery oil on the engine and other machinery of the Steamer Southerner running from this to Charleston, and find it equal to sperm oil. I shall continue the use of the same, and you are at liberty to refer to me at any time.

Yours respectfully, DAVID N. MAXON,
Chief Engineer Steamer Southerner.

Steamboat C. Vanderbilt, N. York, Oct. 11, 1849.

Messrs. Robbins, Langdon & Co.,

Gentlemen: In reply to your inquiries respecting the qualities of your machinery oil, I am happy to inform you that I have been using the article sent me for some time past, not only on the engine but on all other machinery connected with it; and from a careful and close examination, I am well satisfied that your oil is as good as the best of sperm oil for lubricating machinery. I have recommended Mr. Lockwood the agent of the company, to give you their orders.

Yours respectfully, JAMES BAKER,
Engineer Steamboat C. Vanderbilt, Pier 3, N.R.

Brooklyn, August 29, 1849.

Messrs. Robbins, Langdon & Co.,

Gentlemen: Your letter of the 29th was received, and I am happy to inform you that I have used your machinery oil throughout my establishment, and I am still of the opinion that it is as good as the best of sperm oil for lubricating machinery. I should be pleased at any time to have your friends witness the working, and I am sure, after once doing so, will give you their orders. Please send me another cask by the evening of the 3d, and by so doing you will much oblige,

W. M. BURDON, Manufacturer of
Steam Engines and other Machinery, 102 Front st.

A young man of experience in Surveying wishes a situation on a Railroad as an Assistant. Please apply at this office.

Spikes, Spikes, Spikes.

ANY person wishing a simple and effective Spike Machine, or a number of them, may be supplied by addressing
J. W. FLACK,
Troy, N. Y.
March 6, 1850.

8,000 Tons Railroad Iron.

THE OHIO AND PENNSYLVANIA RAILROAD CO. wish to contract for eight thousand tons of Railroad Iron, for the eastern division of their road, extending westward from Pittsburgh. Three thousand tons to be delivered on the Ohio river at Pittsburgh and Beaver, before the close of canal navigation in the present year, 1850; and the remainder in the spring of next year. The rails are to be of the H pattern, in lengths of 20 feet, and are to weigh 60 lbs. per lineal yard. They are to be subject to the inspection of Solomon W. Roberts, Chief Engineer.—For further particulars address the President of the Company at Pittsburgh.

By order of the Board of Directors.

WM. ROBINSON, Jr., President.

To Contractors.

THE TROY AND RUTLAND RAILROAD Co. will receive PROPOSALS for constructing 17 miles of their road, from Salem to the Hoosack river, on the 16th of May next, and decide upon such proposals on the 20th day of May. The necessary information in relation thereto can be had on and after the 26th inst., by application to the undersigned at his office in Salem, Washington Co., N. Y.

C. L. PRESCOTT, Chief Engineer.

April 23d, 1850.

Notice to Contractors.

CENTRAL OHIO RAILROAD.

THE Line of this road between Zanesville and Newark, a distance of about 26 miles, will be ready for examination about the 1st of May next, and Sealed Proposals for the Graduation, Masonry and Bridging of the said road will be received at the office of the company, in Zanesville, until the 20th of May next.

The graduation must be completed by the 1st day of January next—the masonry by the 1st day of June, 1851—and the superstructure of the bridges by the 1st day of July, 1851. The wood work of the bridges not to be commenced until the 1st of January next.

This work will embrace some heavy rock cutting; two bridges across the Pataskala or Licking river, and one across its north branch, also several important cuts and embankments.

The bids may be predicated either upon CASH payments entirely, or upon 75 per cent. cash, and 25 per cent. in the stock of the company.

To contractors at a distance, it may be as well to observe that this work is a part of the Great Central Line, projected as an extension of the Baltimore and Ohio Railroad, from the Ohio river to Central and Western Ohio and Indiana.

The company hope to have the line from Newark to Columbus, 34 miles, ready for examination by the 15th of June next, and for contract by the 1st of July next.

By order of the Board.

ROBERT MAC LEOD,
Engineer in Charge.

Zanesville, April 18, 1850.

Notice to Contractors.

Bellefontaine and Indiana Railroad.

SEALED PROPOSALS will be received at the Company's Office in SIDNEY, Shelby Co., Ohio, on and after Wednesday, May 5th, 1850, for doing the Grubbing, Clearing, Grading and Masonry, of such portions of the BELLEFONTAINE and INDIANA Railroad, as can be prepared for letting by the 15th.

The line extends from some point on the Cleveland, Columbus and Cincinnati Railroad, through MARION, BELLEFONTAINE and SIDNEY, to the STATE LINE, between Ohio and Indiana, a total distance of about 120 miles.

It is expected that the line from the eastern terminus to Marion, about 22 miles, and from Bellefontaine to Sidney, about 23 miles, will then be ready to let; and the remainder of the route as soon thereafter as it can be located and prepared.

Specifications and plans will be ready for inspection and all necessary information may be obtained on application at the Office of the Chief Engineer, in Marion, or to J. Pemberton, Resident Engineer, in Sidney, after the 5th of May.

By order of the Board of Directors.

W. MILNOR ROBERTS, Chief Eng.
Engineer's Office, Marion, Ohio,
March 18, 1850. } 15tf

Railroad Iron Wanted.

Virginia and Tennessee Railroad Office, }

Lynchburg, Va., March 16, 1850.

PROPOSALS will be received at this Office until the 6th of May next, for the delivery in Lynchburg, of Iron Rails for the Virginia and Tennessee Railroad, to be manufactured in or near this town of Virginia Iron.

The said Iron to be made of the best pig metal, and to be delivered at the following times, and in the following quantities, viz: Six thousand tons in the year 1851, and the remainder, (about 15,000 tons) for the whole road, equally, in the years 1852 and 1853.

Separate proposals will also be received for the delivery in Lynchburg, of pig metal, at times and in quantities sufficient for the manufacture of the rails above mentioned, said delivery to commence as early as the first of November, 1850.

The rails and the pig metal will be subjected to strict inspection; the rails are to weigh about 60 lbs. per yard.

At the same time, proposals will be received for the above quantity of Iron, manufactured any where else in America or in England, to be delivered in Lynchburg or Richmond, under the same general conditions as those prescribed for Virginia Iron, manufactured at Lynchburg. Satisfactory security will be required.

Proposals for delivering any portion of the above mentioned quantity, and at periods varying from those specified above, will be considered.

By order of the Board of Directors.

CHAS. F. M. GARNETT,
Chief Engineer.

15tf

To Contractors.

SEALED PROPOSALS will be received at the Office of the Nashville and Chattanooga Railroad Company in Chattanooga until the 20th day of May next, for the graduation and masonry of the Chattanooga Division of said Road—embracing a distance of 27½ miles.

The graduation will be heavy for about 15 miles, (in crossing Raccoon Mountain, and passing around Lookout Mountain bluffs), the balance, average work. The masonry will consist chiefly of cut stone Piers for Tennessee River Bridge, (about 4,000 Perches,) Piers for running Water Bridge, (about 2,000 Perches,) and Pier for Lookout Creek Bridge, about 500 Perches.

Sealed proposals will also be received at the same time and place, for the graduation of 10 miles of the Eastern end of the Winchester Division—embracing some heavy work. Also the masonry of Elk River and Widow's Creek Bridges.

Plans and Profiles of the Work will be exhibited, specifications furnished, and all other desired information given, on application to Mr. James A. Corry, the Engineer in charge of the work, at the Company's Office in Chattanooga, from the 10th of May until the day of letting.

Before making bids the line should be thoroughly examined. The depths of the Cuts and Embankments can be ascertained from the centre stakes. The work to be commenced immediately after the letting. And that portion from Chattanooga to Lookout Bluffs to be completed by the 1st of December next. The other sections to be finished successively on toward the West end of the Division—the last by the 1st of October, 1851.

The most satisfactory testimonials will be required. The payments will be made in cash—reserving the usual 20 per cent. until the completion of the work.

By order of the Board.

JAMES H. GRANT, Chief Eng.
Nashville, Tenn., March 14, 1850.

PROPOSALS will be received at the offices of the Baltimore and Ohio Railroad Company, at Baltimore, Cumberland and Wheeling, up to Wednesday, the 22d day of May next inclusive, for the graduation and masonry of the portion of that road, extending from the bridge on the northwestern turnpike, over the Tygart's valley river, to a point on the south fork of Fish creek, near the mouth of Long Drain, embracing some 56 sections. Also the 8 sections between the mouth of Grave creek and the city of Wheeling.

A variety of work will be presented by the line to be let, which will include light and moderately heavy grading. Several short tunnels, and a considerable amount of bridge masonry.

Specifications may be had at the above named offices on and after the 1st of May ensuing, and further information obtained from the engineer upon the line.

Unexceptionable testimonials of character must accompany the bids, and the bidders are requested to state what other work, if any, they are engaged in, and when it will be completed.

The work must be energetically prosecuted.

By order of the President and Directors.
BENJ. H. LATROBE, Chief Engineer.
Baltimore, April 10, 1850. } 16

Great American Engineering AND MECHANICAL WORK, just published in medium folio, 75 cts.

Part IV of "Specimens of the Stone, Iron and Timber Bridges, Viaducts, Tunnels, &c. &c. of the United States Railroads." By George Duggan, Architect and Civil Engineer.

The present part contains beautifully executed plans, and elevations, of the Starucca, Pa., (stone) Viaduct of 17 arches, 50 feet span each, grade line averaging 90 feet above the valley bed, with the specifications, estimates, &c. &c. Also plates of the details of the timber and iron work of the elegant timber arch 275 feet span, at Cascade Creek, Pa. on the line of the N. Y. & Erie R. R.

N. B.—This work is published by subscription of the most eminent in the engineering profession of the U. States, and will be completed in 12 parts, at 75 cents each to those who remit their names and subscriptions before the 1st June next—when the first 5 parts or one half of the work will be published—after which the price will be raised to \$1 per part.

To those making a present remittance of \$5, and the remainder \$4, when they have been supplied with the first six parts, the work will be forwarded regularly as published. Parties remitting \$9 shall receive it monthly post-free in any part of the United States.

"It is a work that was a great desideratum, and must prove of great benefit to the engineering profession generally, and especially to the tyro in practical engineering and mechanical knowledge; in truth it strikes us, that it would require years of labor and patient toil on the part of a young engineer to prepare the drawings, and collect the information that will be embodied in this work, and can now be secured for the trifling sum of \$9"—[Scientific Amer. March 16, 1850.]

In connection with this subject (Iron Railroad Structures) we take occasion to call attention again to Mr. Duggan's valuable and expensive publication, exhibiting drawings, with full descriptions of the various stone, iron and wooden bridges, viaducts, tunnels, culverts, etc., of all the Railroads in the United States. Mr. Duggan is an accomplished Architect and Civil Engineer, who came from Ireland to this country to exercise his profession; but finding Railroad construction here, in many respects, different from that he had been accustomed to in Europe, he applied himself to the study of our system; and the fruits of his researches and investigations embodied in this work, are well calculated to meet the exigencies of engineers, and to assist draughtsmen, bridge builders, mechanics and students. The work will be supplied to subscribers only, in 12 parts, at 75 cents each.—[N. Y. Journal of Commerce, Feb. 14, 1850.]

Published by **GEORGE DUGGAN,**
300 Broadway, New York.

To whom all communications should be addressed, and subscriptions forwarded.

FOWLER M. RAY'S Patent India-rubber Railroad CAR SPRING.

New York and Erie Railroad Shops,
Piermont, March 26, 1850.

This will certify that from practical experience in the use of Fowler M. Ray's India rubber Car Springs, I believe them to be far superior to any others now in use.

I have never known them to be affected by any change of temperature, as other Rubber Springs have been affected on this road.

I am at the present time repairing a Passenger Car that Mr. Ray and myself mounted with his springs about two years and eight months since.

The springs are at the present time as perfect, to all appearances, as when first applied to the car.

Respectfully yours,

HORACE B. GARDNER,
Foreman of the Car Shops.

Supt. Office N.Y. & H. R.R., }
New York, March 8, 1850.

This is to certify that we have used the Rubber Springs manufactured by Mr. F. M. Ray for the past twenty months, "both for Passenger and Freight Car Springs and Bumpers, and of different sizes," and have in every case given entire satisfaction, and I consider them the best spring now in use.

M. SLOAT, Supt.

Harlem R.R. Depot, }
New York, March 7, 1850.

This is to certify that we have used Mr. F. M. Ray's India-rubber Springs for over eighteen months, and find them to be easy and durable, and recommend them to railroad companies as being superior to anything we have tried.

J. M. SMART,
Foreman at 42d St. Depot.

Office of the New Jersey Railroad Co., }
Jersey City, March 7, 1850.

This is to certify that we have had Mr. F. M. Ray's India-rubber Springs in constant use under our cars, and as Bumper Springs for upwards of two years, and they have in every way given perfect satisfaction.

The present form of spring we deem far superior to the form of Disk, having used both forms, although we have none of those made in Disks at present in use.

We take pleasure in recommending these springs to all railroad companies.

J. P. JACKSON, Vice Pres.
New Jersey Railroad and Trans. Co.

Roxbury, February 28, 1850.

In compliance with your request, I take great pleasure in stating the result of my experience in the use of "Ray's Patented Vulcanised India-rubber Car and Engine Springs." We have used them nearly two years, and never had one fail in any way. The cold weather does not affect them, as it has other rubber springs we have used.

With sixteen years' experience as superintendent of machinery on the Boston and Providence railroad, I take pleasure in saying that your springs are the best we ever used, or I ever saw used elsewhere. We have 20 cars rigged with them, of which I can say that the springs are as good now as when first applied. I put 24 lbs. of the rubber under the fore and end of one of our heaviest engines, taking off 250 lbs. of steel springs—it has been in use 18 months, and is in as good condition now as when first put under the engine.

Very respectfully yours,

GEO. S. GRIGGS,
Supt. of Machinery, Boston and Prov. R.R.

New York, March 11, 1850.

I have used the Patent India-rubber Spring purchased of Mr. Ray, upon the cars of the New York and New Haven Railroad, and have found them efficient and economical; and when applied to the axles and draw springs, believe them to be quite equal to any in use. I have found a combination of these springs with a steel spring under the transom beam a very satisfactory arrangement, and am now using this plan in all new cars.

Yours respectfully,
ROBERT SCHUYLER.

February 25, 1850.

From practical observation of the use of the India-rubber Car Springs, manufactured and sold by your company, we are entirely satisfied in their application, and do not hesitate to recommend them as elastic, durable, requiring no repairs for years, and retaining their consistency during all extremes of weather. We have applied them for the past two years, and consider them superior for all railroad purposes.

Yours truly,

OSGOOD BRADLEY, Car Builder, Worcester.
T. & C. WASON, do, Springfield.
DEAN, PACKARD & MILLS, do, do.
DAVENPORT & BRIDGES, do, Cambridgeport.

Office New Jersey Railroad Co., }
Jersey City, March 8, 1850.

FOWLER M. RAY, Esq.,

Dear Sir: In answer to your enquiries respecting the operation of the Vulcanised Rubber Springs, purchased by our company from you some two years since, I reply that they are superior to any spring in use, (that I have either seen or heard of).

The improved form of your spring, consisting of a solid piece of vulcanised rubber with bands on the outside, is far superior to your first form, consisting of disks of rubber with metallic plates interposed.

The last named form was tried, if you recollect, at a much earlier period; and then was replaced by your last form.

I have no hesitation in saying that your springs have given entire satisfaction, and most cheerfully recommend them to railroad companies throughout the country for the following reasons:

- 1st. The cost is 30 per cent. less.
- 2d. Saving of weight on each car of 8 wheels from 700 to 800 lbs.
- 3d. Less care and attention is required, as they are not liable to get out of repair.
- 4th. A great saving is secured in the wear and tear of the cars and rails from their great elasticity.
- 5th. The freedom from noise.
- 6th. There is greater safety in case of accident, as they cannot be broken.
- 7th. The comfort of passengers is enhanced sufficiently to pay the expense, waiving all the other reasons that I have given.

Should this fail to satisfy any person enquiring, you are at liberty to refer to me, No. 150 Washington St., Jersey City.

Yours respectfully,
T. L. SMITH, Supt.

Fall River, February 2, 1850.

In answer to yours of the 20th ult. I would say that this company has for some 10 or 12 months past been using "Ray's India-rubber Springs." We have applied them to both passenger and freight cars with uniform success. They have invariably preserved their elasticity and consistency through all the extremes of weather; and we are now applying them whenever the steel spring fails. I am well satisfied that they are particularly adapted for railroad purposes.

Very respectfully yours,

GEO. HAVEN,
Supt. Fall River Railroad.

Jersey City, March 9, 1850.

This is to certify that the present form of Mr. F. M. Ray's India-rubber Car Spring I consider far superior to the form of Disk, having used both forms.

I take pleasure in recommending these springs to all railroad companies.

DAVID H. BAKER,
Foreman of Car Shop of N.J. R.R. & Trans. Co.

Boston, March 5, 1850.

In answer to your enquiry about India-rubber Springs, I have to say that we have used them to a considerable extent on both freight and passenger cars, and also on several of our tenders; and I am very well satisfied that they answer all the purposes for which they are intended. I believe the India-rubber will soon supersede all other springs for cars and tenders.

Yours truly,

S. M. FELTON,
Supt. Fitchburg Railroad.

Old Colony Railroad Office,
Boston, March 6, 1850.

EDWARD CRANE, Esq.,

President New England Car Co.,

Dear Sir: In compliance with your request I would state that the Old Colony Railroad Company have had in use upon their road, India-rubber Springs furnished by your company, for more than eighteen months past, during which time they have been extensively used under Passenger and Freight Cars, Locomotive Tenders, and for Drawer and Buffing Springs, with the most perfect success. The elasticity and consistency of the Rubber has never been unfavorably affected by either extremes of heat or cold—and from the experience which we have had in the use of Rubber Springs, I think them well adapted for railroad purposes—and therefore we have for some months past used Rubber almost exclusively, in all places where springs are required.

Respectfully yours, etc.,

JAS. H. MOORE,
Supt. O. C. Road.

Troy, February 27, 1850.

We have been using your India-rubber Car Springs for nearly two years—and we take pleasure in saying that in our opinion the rubber has to a certain extent already, and may eventually entirely supersede all other Springs for Railroad Car purposes. We now use it entirely for Draw Springs and Bumpers, considering it better and lighter than steel.

During our two years' experience in the use of it, we have not known any to lose their elasticity, or fail in any way; and we cheerfully recommend the rubber for railroad car springs.

Very respectfully,
EATON, GILBERT & CO.

To Practical Machinists.

AN excellent opportunity now occurs to a practical Machinist, of WELL ESTABLISHED REPUTATION, and some capital, to engage extensively in the STEAM ENGINE, BOILER AND FOUNDRY BUSINESS.

An establishment is now ready for business, ample in all its details, including extensive wharf room, for any sized steamboats, and from its position, if properly conducted, will doubtless command a large share of business.

A practical Machinist, as a partner is required, to conduct the whole establishment: and only those FULLY COMPETENT need apply. Address (post paid) "MACHINE CO.," Box No. 741, Philadelphia, Pa. 1ml4

Etna Safety Fuse.

THIS superior article for igniting the charge in wet or dry blasting, made with DUPONT'S best powder, is kept for sale at the office and depot of

REYNOLDS & BROTHER,

Sole Manufacturers, }
No. 85 Liberty St.
NEW YORK.

And in the principal cities and towns in the U. States. The Premium of the AMERICAN INSTITUTE was awarded to the Etna Safety Fuse at the late Fair held in this city.

November 3, 1849.

American Railway Guide, AND POCKET COMPANION FOR THE UNITED STATES;

CONTAINING Correct Tables, showing the time for starting of trains from all stations, distances, fares, etc., on all the Railway lines in the U. States; also many of the principal Steamboat and Stage routes — accompanied by a complete RAILWAY MAP. Price, single copies 10 cts., or \$1 per annum. Published on the first of every month, corrected from returns furnished by the Railway Superintendents throughout the Union.

This book has been compiled somewhat on the plan of Bradshaw's Guide, with such improvements in size, form and arrangement as have seemed desirable; and the publisher confidently hopes it will not be found liable to the objections of incompleteness and incorrectness, which have been made, and justly too, against various other similar works heretofore issued.

The subscriber having had the management of the NEW YORK PATHFINDER almost from its commencement, has enjoyed superior facilities in obtaining information relating to the thoroughfares of travel, and is therefore well qualified to prosecute with success the arduous undertaking of furnishing a complete and correct national guide book.

STRINGER & TOWNSEND, General Agents, 222 Broadway: and sold also by Booksellers and Periodical Dealers generally throughout the country; also on all the Railways and Steamboats.

CURRAN DINSMORE, Publisher.
N. Y. Pathfinder Office,
123 Fulton St., New York City.

ENGINEERS.

Atkinson, T. C.,
Alexandria and Orange Railroad, Alexandria, Va.

Baneks, C. W.,
Civil Engineer, Vicksburg, Miss.

Berrien, John M.,
Michigan Central Railroad, Marshall, Mich.

Buckland, George,
Troy and Greenbush Railroad.

Clement, Wm. H.,
Little Miami Railroad, Cincinnati, Ohio.

Cozzens, W. H.,
Engineer and Surveyor, St. Louis, Mo.

Alfred W. Craven,
Chief Engineer Croton Aqueduct, New York.

Davidson, M. O.,
Eckhart Mines, Alleghany Co., Maryland.

Fisk, Charles B.,
Cumberland and Ohio Canal, Washington, D. C.

Felton, S. M.,
Fitchburgh Railroad, Boston, Mass.

Floyd-Jones, Charles,
South Oyster Bay, L. I.

Gzowski, Mr.,
St. Lawrence & Atlantic Railroad, Montreal, Canada.

Gilbert, Wm. B.,
Rutland and Burlington Railroad, Rutland, Vt.

Grant, James H.,
Nashville and Chattanooga R. R., Nashville, Tenn.

Harry, P.,
Binghamton, New York.

S. W. Hill,
Mining Engineer and Surveyor, Eagle River,
Lake Superior.

Holcomb, F. P.,
Southwestern Railroad, Macon, Ga.

Johnson, Edwin F.,
New York and Boston Railroad, Middletown Ct.

Latrobe, B. H.,
Baltimore and Ohio Railroad, Baltimore, Md.

Miller, J. F.,
Worcester and Nashua Railroad, Worcester, Mass.

Morris, Elwood,
Schuylkill Navigation, Schuylkill Haven, Pa.

Morton, A. C.,
Atlantic and St. Lawrence Railroad, Portland, Me.

McRae, John,
South Carolina Railroad, Charleston, S. C.

Nott, Samuel,
Lawrence and Manchester Railroad, Boston.

Prichard, M. B.,
East Tennessee and Georgia R. R., Cleveland, Tenn.

Roebbling, John A.,
Trenton, N. J.

W. Milnor Roberts,
Bellefontaine and Indiana Railroad, Marion, Ohio.

Roberts, Solomon W.,
Ohio and Pennsylvania Railroad, Pittsburgh, Pa.

Sanford, C. O.,
South Side Railroad, Virginia.

Schlatter, Charles L.,
Northern Railroad (Ogdensburg), Malone, N. Y.

Sours, Peter,
Rahway, New Jersey.

Stark, George.,
Bost., Con. and Mont. R. R., Meredith Bridge, N. H.

Steele, J. Dutton,
Pottstown, Pa.

Trimble, Isaac R.,
Philad., Wil. & Baltimore Railroad, Wilmington, Del.

Tinkham, A. W.,
United States Fort, Bucksport, Me.

Thomson, J. Edgar.,
Pennsylvania (Central) Railroad, Philadelphia.

Troost, Lewis,
Alabama and Tennessee Railroad, Selma, Ala.

Whipple, S.,
Civil Engineer and Bridge Builder, Utica, N. Y.

Williams, E. P.,
Auburn and Schenectady Railroad, Auburn, N. Y.

Williams, Charles H.,
Milwaukee, Wisconsin.

HOTELS.

JONES' HOTEL,
NO. 152 CHESTNUT STREET,
PHILADELPHIA.
BRIDGES & WEST, Proprietors.

DUNLAP'S HOTEL,
On the European Plan,
NO. 135 FULTON STREET,
Between Broadway and Nassau St.,
NEW YORK.

BUSINESS CARDS.

J. T. Hodge
Will attend to the examination of mining tracts near
Lake Superior, and prepare Reports and Maps.
Address, during the Summer,
Ontanagon Postoffice, Lake Superior.

Cumberland Steam Coal,

FROM THE
FROSTBURG MINES, MD.

H. A. TUCKER,
Agent of Frostburg Coal Co.
No. 28 Merchants' Exchange, New York.

Eaton, Gilbert & Co.,
Railroad Car, Coach and Omnibus Builders,
TROY, N. Y.

Nathan Caswell,
METAL BROKER, 69 WALL ST., N. Y.
For the Purchase and Sale of Railroad Iron (new and old), Boiler Plates, Pig and Bar Iron, Lead, Tin, Copper, Spelter, etc. Refers to
Messrs. Hoorman, Johnston, & Co., New York.
" Grinnell, Minturn & Co., "
" Barston, Pope & Co., "
" Earps & Brink, Philadelphia.
" E. Pratt & Brother, Baltimore.
John Barstow, Esq., Providence.
Lewis Bullard, Esq., Boston.
February 9, 1860. 6m*

United States Railroad Guide and Steamboat Journal.

CONTAINING OFFICIAL TIME ADVERTISEMENTS,
Tables of Stations, Distances, Fares, Time, etc.,
with much miscellaneous matter for the travelling public. Price 12 cents a copy. Yearly subscription \$1.
Published at 43 Ann street, New York.

J. & Riley Carr,
Manufacturers of Cast, Shear, German and Blister
STEEL,
Of all Descriptions, Warranted Good.
BAILEY-LANE WORKS, SHEFFIELD.

R. S. DENTON, Agent,
NO. 20 CLIFF ST., NEW YORK.

STEEL AND FILES.

R. S. Denton,
20 CLIFF STREET, NEW YORK,
AGENT FOR

J. & Riley Carr's
BAILEY-LANE WORKS, SHEFFIELD,
Manufacturers of Cast, Shear, German and Blister
STEEL

Of all descriptions. Warranted Good
FILES.

Manufacturers of Machinists' Warranted Best Cast
Steel Files, expressly for working upon Iron and Steel,
made very heavy for recutting.
A full Stock of Steel and Files at all times on
hand. 6m4

Walter R. Johnson,
CIVIL AND MINING ENGINEER AND AT-
torney for Patents. Office and Laboratory, F St.,
opposite the Patent office, Washington, D. C.

Dudley B. Fuller & Co.,
IRON COMMISSION MERCHANTS,
No. 139 GREENWICH STREET,
NEW YORK.

Manning & Lee,
GENERAL COMMISSION MERCHANTS,
NO. 51 EXCHANGE PLACE,
BALTIMORE.

Agents for Avalon Railroad Iron and Nail Works,
Maryland Mining Company's Cumberland Coal 'CED'
—'Potomac' and other good brands of Pig Iron.

Cop Waste.

CLEAN COP WASTE, suitable for cleaning Rail-
road, Steamboat and Stationary Engines, con-
stantly on hand and for sale by

KENNEDY & GELSTON,
5½ Pine St., New York.
October 27, 1849, 3m

Ranstead, Dearborn & Co.,
MANUFACTURERS OF
LOCOMOTIVE CRANKS AND CAR AXLES,
ALSO
WROUGHT IRON SHAFTING,
And All Kinds of Hammered Shapes.
Forge at Commercial Point, Dorchester,
Office 25 Foster's Wharf, opposite No. 211 Broad St.
BOSTON.

Henry J. Ibbotson,
IMPORTER of Sheffield and Birmingham Goods.
Also, Agent for the Manufacture of Telegraph
Wire. 218 PEARL ST., NEW YORK.

**Cumberland, (Md.) Coals for
Steaming, etc.**

ORDERS RECEIVED FOR AND FILLED
by J. COWLES, 37 Wall St., N. Y.

Railroad Car Manufacturer's Furnishing Store.

F. S. & S. A. MARTINE,

IMPORTERS AND MANUFACTURERS OF

RAIL ROAD CAR & CARRIAGE LININGS,

PLUSHERS, CURTAIN MATERIALS, ETC.,
112 WILLIAM ST., NEAR JOHN.

3-4 and 6-4 Damasks, Union and Worsted; Mo-
reens, Rattinetta, Cloths, Silk and Cotton Velvets,
English Bunting

To Engineers and Surveyors.

E. BROWN AND SON Mathematical inst. ma-
kers No. 27 Fulton Slip, New York, make and keep
for sale, Theodolites, Levelling inst., Levelling rods,
Surveyors Compasses, and Chains, Cases of Mathe-
matical drawing insts. various qualities, together with
a general assortment of Ivory Scales and small insts.
generally used by Engineers.

Samuel Kimber & Co., COMMISSION MERCHANTS

WILLOW ST. WHARVES, PHILADELPHIA.
AGENTS for the sale of Charcoal and Anthracite
Pig Iron, Hammered Railroad Car and Locomo-
tive Axles, Force Pumps of the most approved con-
struction for Railroad Water Stations and Hydraulic
Rams, etc., etc.
July, 27, 1849.

James Herron, Civil Engineer,

OF THE UNITED STATES NAVY YARD,
PENSACOLA, FLORIDA.,

PATENTEE OF THE

HERRON RAILWAY TRACK.

Models of this Track, on the most improved plans,
may be seen at the Engineer's office of the New York
and Erie Railroad.

To Railroad Companies.

—WROUGHT IRON WHEELS—
SAFETY AND ECONOMY.

NORRIS' LOCOMOTIVE WORKS, SCHENECTADY, NEW YORK,

Are Manufacturing Wrought Iron Driving, Truck,
Tender, and Car Wheels—made from the best Ameri-
can Iron. Address E. S. NORRIS.
May 16, 1849.

Machinery Warehouse.

S. C. HILLS, No. 43 Fulton street, New York, has
constantly for sale Steam Engines, Boilers, Lathes,
Chucks, Drills, Planers, Force and Suction Pumps;
Tenoning, Morticing and Boring Machines, Shingle
Machines, Bolt and Nut Machines, Belting, Oil, Iron
and Lead Pipe; Rubber, Percha and Leather Hose,
&c., &c.

S. C. H.'s arrangements with several machine shops
are such that he can supply, at very short notice, large
quantities of machinery.

November 23, 1849.

George O. Robertson, BROKER IN SCOTCH AND AMERICAN PIG IRON;

Bar Iron, Lead, Spelter, Tin, Copper, etc.,
No. 4 Liberty Place, MAIDEN LANE,
(Near Broadway.)
NEW YORK

Manufacture of Patent Wire ROPE AND CABLES,

For Inclined Planes, Suspension Bridges, Standing
Rigging, Mines, Cranes, Derrick, Tilters, &c., by
JOHN A. ROEBLING, Civil Engineer,
TRENTON, N. J.

Samuel D. Willmott, MERCHANT, AND MANUFACTURER OF CAST STEEL WARRANTED SAWS,

—AND FILES—

IMPORTER OF THE
GENUINE WICKESLY GRINDSTONES
NO. 8 LIBERTY STREET,
NEW YORK.

Doremus & Harris, ANALYTICAL & CONSULTING CHEMISTS, 179 BROADWAY, NEW YORK.

SCHOOL OF CHEMISTRY.

IRON.

Railroad Iron.

3,000 TONS C. L. MAKE 63½ lbs. per yard,
now landing and to arrive.

Also contracts made for future delivery of above su-
perior make English Iron.

300 Tons Banks Best Iron, Round, Square and Flat.

200 " English Bar " " " "

10 " 9-16 Square Iron for Railroad Spikes.

For sale in lots to suit purchasers by

DAVID W. WETMORE.

New York, March 26, 1850. 3m

SPRING STEEL FOR LOCOMOTIVES, TEN-
DERS AND CARS.—The subscriber is engaged
in manufacturing spring steel from 1½ to 6 inches in
width, and of any thickness required: large quantities
are yearly furnished for railroad purposes, and where-
ever used its quality has been approved of. The estab-
lishment being large, can execute orders with great
promptitude, at reasonable prices, and the quality war-
ranted. Address J. F. WINSLOW, Agent,
Albany Iron and Nail Works.

Railroad Iron.

THE UNDERSIGNED, Agents for Manufacturers, are
prepared to contract to deliver Rails of superior
quality, and of any size or pattern, to any ports of dis-
charge in the United States.

COLLINS, VOSE & CO.,
158 South St.

New York, November 17, 1849.

Railroad Iron.

1,500 Tons weighing 53 lbs. per lineal yard.

500 " " 57 " " "

500 " " 56 " " "

500 " " 60 & 61 lbs. "

Also 2½x½ flat rails. All the above being of approv-
ed patterns. For sale by

DAVIS, BROOKS, & CO.,
68 Broad street.

N.B.—Rails imported on commission, or at a fixed
price.

Iron.

Pig Iron, Anthracite and Charcoal; Boiler and Flue
Iron, Spring and Blistered Steel, Nail Rods, Best Re-
fined Bar Iron, Railroad Iron, Car Axles, Nails, Stove
Castings, Cast Iron Pipes of all sizes, Railway Chairs
of approved patterns for sale by

COLEMAN, KELTON & CAMELL,
109 N. Water St., Philadelphia.

IRONDALE PIG METAL, MANUFACTURED

and for sale by the Bloomsburg Railroad Iron Co.
DUDLEY FISHER, Treasurer.
75 N. Water St., Philadelphia.

Railroad Iron.

500 Tons, afloat, weighing 57 pounds per lineal
yard, for sale by

COLLINS, VOSE & CO.,
158 South St.

New York, November 17, 1849. 1m46

Railroad Iron.

1675 Tons, weighing about 61 lbs. per yard, 90
tons, weighing about 52 lbs. per yard, and
825 tons, weighing about 53½ lbs. per yard, of the lat-
est and most approved patterns of T rail, for sale by

BOORMAN, JOHNSTON & CO.,
119 Greenwich street.

New York, Feb. 25, 1850.

N.B.—B. J. & Co are also prepared to take con-
tracts for English rails, delivered in any of the Atlan-
tic ports of the United States.

Railroad Iron.

THE UNDERSIGNED, HAVING made arrange-
ments abroad, are prepared to contract for the de-
livery of Foreign rails, of approved brands upon the
most favorable terms.

They will also make contracts for American rails,
made at their Trenton works, from Andover Iron, in
whole or in part, as may be agreed upon.

They are prepared to furnish Telegraph, Spring and
Market Wire; Braziers and Wire Rods; Rivets and
Merchant Bars to order, all made exclusively from An-
dover Iron. The attention of parties who require Iron
of the very best quality for special purposes, is respect-
fully invited.

COOPER & HEWITT,
17 Burling Slip, New York.

February 15, 1850.

Glendon Refined Iron.

Round Iron, Band Iron, Hoop Iron,
Square " Flat " Scroll "

Axles, Locomotive Tyres,
Manufactured at the Glendon Mills, East Boston, for
sale by
GEORGE GARDNER & CO.,
5 Liberty Square, Boston, Mass.

Sept. 15, 1849. 3m37

PATENT HAMMERED RAILROAD, SHIP &
BOAT SPIKES.—The Albany Iron Works
have always on hand, of their own manufacture, a
large assortment of Railroad, Ship and Boat Spikes
from 2 to 12 inches in length, and of any form of head;
From the excellence of the material always used in
their manufacture, and their very general use for rail-
roads and other purposes in this country, the manu-
facturers have no hesitation in warranting them fully
equal to the best spikes in market, both as to quality
and appearance. All orders addressed to the subscrib-
ers at the works will be promptly executed.

JOHN F. WINSLOW, Agent.

Albany Iron and Nail Works, Troy, N. Y.
The above Spikes may be had at fact prices, of
Erastus Corning & Co Albany; Merritt & Co., New
York; E. Pratt & Br. 1st, E. Baere Md

LAP—WELDED WROUGHT IRON TUBES

FOR

TUBULAR BOILERS,

FROM ONE AND A QUARTER TO SEVEN
INCHES IN DIAMETER.

THE ONLY Tubes of the same quality and man-
ufacture as those so extensively used in England,
Scotland, France and Germany, for Locomotive, Ma-
rine and other Steam Engine Boilers.

THOMAS PROSSER & SON, Patentees,
28 Platt street, New York.

Railroad Iron.

THE UNDERSIGNED ARE PREPARED TO
contract for the delivery of English Railroad Iron
of favorite brands, during the Spring. They also re-
ceive orders for the importation of Pig, Bar, Sheet, etc.
Iron.

THOMAS B. SANDS & CO.,
22 South William street,

February 3, 1849.

New York.

Iron Store.

THE Subscribers, having the selling agency of the
following named Rolling Mills, viz: Norristown,
Rough and Ready, Kensington, Triadelphia, Potts-
grove and Thorndale, can supply Railroad Companies,
Merchants and others, at the wholesale mill prices for
bars of all sizes, sheets cut to order as large as 59 in.
diameter; Railroad Iron, domestic and foreign; Loco-
motive tire welded to given size; Chairs and Spikes;
Iron for shafting, locomotive and general machinery
purposes; Cast, Shear, Blister and Spring Steel; Boil-
er rivets; Copper; Pig Iron, etc., etc.

MORRIS, JONES & CO.,
Iron Merchants,

Schuylkill 7th and Market Sts., Philadelphia.
August 16, 1849. 1y33

Railroad Iron.

THE MOUNT SAVAGE IRON WORKS, AL-
legany county, Maryland, having recently pass-
ed into the hands of new proprietors, are now prepar-
ed, with increased facilities, to execute orders for any
of the various patterns of Railroad Iron. Communi-
cations addressed to either of the subscribers will have
prompt attention. J. F. WINSLOW, President

Troy, N. Y.

ERASTUS CORNING, Albany

WARREN DELANO, Jr., N. Y.

JOHN M. FORBES, Boston.

ENOCH PRATT, Baltimore, Md.

November 6, 1849.

Railroad Iron.

THE SUBSCRIBERS ARE PREPARED TO
take orders for Railroad Iron to be made at their
Phoenix Iron Works, situated on the Schuylkill Riv-
er, near this city, and at their Safe Harbor Iron Works,
situated in Lancaster County, on the Susquehanna
river; which two establishments are now turning out
upwards of 1800 tons of finished rails per month.

Companies desirous of contracting will be promptly
supplied with rails of any required pattern, and of the
very best quality.

REEVES, BUCK & CO.,
45 North Water St., Philadelphia.

March 15, 1849.

Monument Foundry.

A. & W. DENMEAD & SON,
Corner of North and Monument Sts.,—Baltimore,

HAVING THEIR

IRON FOUNDRY AND MACHINE SHOP

In complete operation, are prepared to execute faithfully and promptly, orders for Locomotive or Stationary Steam Engines, Woolen, Cotton, Flour, Rice, Sugar Grist, or Saw Mills, Slide, Hand or Chuck Lathes, Machinery for cutting all kinds of Gearing, Hydraulic, Tobacco and other Presses, Car and Locomotive patent Ring Wheels, warranted, Bridge and Mill Castings of every description, Gas and Water Pipes of all sizes, warranted, Railroad Wheels with best faggotted axle, furnished and fitted up for use, complete. Being provided with Heavy Lathes for Boring and Turning Screws, Cylinders, etc., we can furnish them of any pitch, length or pattern. Old Machinery Renewed or Repaired—and Estimates for Work in any part of the United States furnished at short notice.

June 8, 1849.

Iron Wire.

REFINED IRON WIRE OF ALL KINDS,
Card, Reed, Cotton-flyer, Annealed, Broom, Buckle, and Spring Wire. Also all kinds of Round, Flat or Oval Wire, best adapted to various machine purposes, annealed and tempered, straightened and cut any length, manufactured and sold by
ICHABOD WASHBURN.

Worcester, Mass., May 25, 1849.

American and Foreign Iron.

FOR SALE,

300 Tons A 1, Iron Dale Foundry Iron.
100 " 1, " " " "
100 " 2, " " " "
100 " " Forge " "
400 " Wilkesbarre " "
100 " "Roaring Run" Foundry Iron.
300 " Fort " " "
50 " Catocin " " "
250 " Chikiswalungo " " "
50 " "Columbia" "chilling" iron, a very superior article for car wheels.
75 " "Columbia" refined boiler blooms.
30 " 1 x 1 Split iron.
50 " Best Penna. boiler iron.
50 " "Puddled" " "
50 " Bagnall & Sons refined bar iron.
50 " Common bar iron.

Locomotive and other boiler iron furnished to order.

GOODHUE & CO.,

New York.

64 South street

American Pig, Bloom and Boiler Iron.

HENRY THOMPSON & SON,
No 57 South Gay St., Baltimore, Md.,

Offer for sale. Hot Blast Charcoal Pig Iron made at the Catocin (Maryland), and Taylor (Virginia), Furnaces; Cold Blast Charcoal Pig Iron from the Cloverdale and Catawba, Va., Furnaces, suitable for Wheels or Machinery requiring extra strength; also Boiler and Flue Iron from the mills of Edge & Hilles in Delaware, and best quality Boiler Blooms made from Cold Blast Pig Iron at the Shenandoah Works, Va. The productions of the above establishments can always be had at the lowest market price, for approved paper.

American Pig Iron of other brands, and Rolled and Hammered Bar Iron furnished at lowest prices. Agents for Watson's Perth Amboy Fire Bricks, and Rich & Cos. New York Salamander Iron Chests.

Baltimore, June 14, 1849.

6 mos

Wheel, Forge and Foundry Iron.

LOCUST GROVE Wheel Iron of great strength and superior chilling property. Balt. Charcoal Forge Iron, from Patuxent, Curtis Creek and Gunpowder furnaces.

Elkridge Foundry Iron, of superior strength and softness. Anthracite and Charcoal Iron from Pennsylvania and Virginia. Gas and Water Pipes, Lamp Posts from Elkridge furnace.

LEMMON & GLENN,

6m9

62 Buchanan's Wharf, Baltimore.

Iron.

THE SUBSCRIBERS having resumed the agency of the New-Jersey Iron Company, are prepared to execute orders for the different kinds and sizes of Iron usually made at the works of the company, and offer for sale on advantageous terms.—

150 tons No. 1 Boonton Foundry Pig Iron.

100 " No. 2 do. do. do.

300 " Nos. 2 & 3 Forge do. do.

100 " No. 2 Glendon do. do.

140 " Nos. 2 & 3 Lehigh Crane do. do.

100 " No. 1 Pompton Charcoal do.

100 " New-Jersey Blooms

50 " New-Jersey Faggoting Iron, for shafts

Best Bars, $\frac{1}{2}$ to 4 inch by $\frac{1}{2}$ to 1 inch thick.

Do do Rounds and Squares, $\frac{1}{2}$ to 3 inch.

Rounds and Squares, 3-16 to 1 inch.

Half Rounds, $\frac{1}{2}$ to 1 in. Ovals & Half Ovals $\frac{1}{2}$ to 1 $\frac{1}{2}$ in.

Bands, $\frac{1}{2}$ to 4 inch. Hoops, $\frac{1}{2}$ to 2 inch.

Trunk Hoops, $\frac{1}{2}$ to 1 $\frac{1}{2}$ in. Horse Shoe & Nut Iron.

Nail Plates. Railroad Spikes.

DUDLEY B. FULLER & Co., 139 Greenwich-st. and 85 Broad-st.

WILLIAM JESSOP & SONS' CELEBRATED CAST-STEEL.

The subscribers have on hand, and are constantly receiving from their manufactory,

PARK WORKS, SHEFFIELD,

Double Refined Cast Steel—square, flat and octagon.

Best warranted Cast Steel—square, flat and octagon.

Best double and single Shear Steel—warranted.

Machinery Steel—round.

Best and 2d gy. Sheet Steel—for saws and other purposes.

German Steel—flat and square, "W. I. & S." "Eagle" and "Goat" stamps.

Genuine "Sykes," L Blister Steel.

Best English Blister Steel, etc., etc., etc.

All of which are offered for sale on the most favorable terms by

WM. JESSOP & SONS,

91 John street, New York.

Also by their Agents—

Curtis & Hand, 47 Commerce street, Philadelphia.

Alex'r Fullerton & Co., 119 Milk street, Boston.

Stickney & Beatty, South Charles street, Baltimore.

May 6, 1848.

JOHNSON, CAMMELL & Co's Celebrated Cast Steel,

AND

ENGINEERING AND MACHINE FILES,
which for quality and adaptation to mechanical uses, have been proved superior to any in the United States. Every description of square, octagon, flat and round cast steel, sheet, shovel and railway spring steel, best double and single shear steel, German steel, flat and square, goat stamps, etc. Saw and file steel, and steel to order for any purposes, manufactured at their Cyclops Steel Works Sheffield.

JOHNSON, CAMMELL & CO.,

100 William St., New York.

November 23 1849.

Railroad Iron.

OF ANY PATTERN AND WEIGHT,
Of a Favorite Brand,

And deliverable in Bond, or Duty paid, at any Port of the U. S., contracted for on favorable terms, by

CHARLES ILLIUS,

20 Beaver St., New York.

Pig and other Iron also contracted for. Sole Agent for "Baxter's Machine and Burning Oil"—particularly adapted for "Railroads" and other Machinery—Preferred to Sperrin by the many now using it, and 25 per cent. cheaper.

CUT NAILS OF BEST QUALITY, BAR IRON
(including Flat Rails) manufactured and for sale by

FISHER, MORGAN & CO.,

75 N. Water St., Philadelphia.

Ogden & Martin's ROSENDALE CEMENT.

WE are prepared to enter into arrangements for supplying our Cement for public works or other purposes. We warrant the cement equal in every respect to any manufactured in this country. It attains a great degree of hardness, sets immediately under water, and is a superior article for masonry coming in contact with water, or requiring great strength.

For sale in tight barrels, well papered, at their office by
OGDEN & MARTIN, 104 Wall st.

February 16, 1850.

The above cement is used in most of the fortifications building by government.

To Steam Engine Builders.

THE Undersigned offer for sale, at less than half its cost, the following new machinery, calculated for an engine of 62 inches cylinder and 10 feet stroke, viz.

2 Wrought Iron Cranks, 60 inches from centre to centre.

1 Do. do. Connecting Rod Strap.

2 Do. do. Crank Pins.

1 Eccentric Strap.

1 Diagonal Link with Brasses.

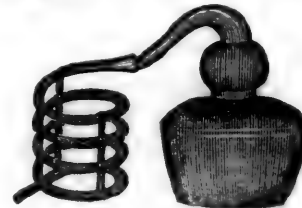
1 Cast Iron Lever Beam (forked).

The above machinery was made at the West Point Foundry for the U. S. Steamer Missouri, without regard to expense, is all finished complete for putting together, and has never been used. Drawings of the cranks can be seen on application to

HENRY THOMPSON & SON,

No. 57 South Gay St., Baltimore, Md.

Sept. 12, 1849.



P. H. Griffin,

Corner of Steuben and James Sts. Albany, N.Y., CONTINUES to manufacture copper flues for locomotive boilers, brewers' coppers, stills, tanner heaters, etc. Copper work in general, at the shortest notice. He has constantly on hand brass cocks, brass valves, copper pumps of every variety, Orders promptly attended to.

1y14

To Railroad Companies.

FOR SALE—A Second-hand Locomotive Engine and Tender, of about 10 tons weight, in good order, and warranted to perform well. Any company wanting a cheap engine for a passenger or light burden train, will rarely meet with an opportunity so favorable as the present. The engine and tender are in perfect running order, and will be tested to the satisfaction of any one wishing to purchase. Price \$1,500.

Address **J. B. MOORHEAD,**

Frazer P.O., Chester county, Pa.

P.S.—The Engine can be seen by calling on H. Osmond & Co., Car-builders, Broad st., Philadelphia.

September 6, 1849.

India-rubber for Railroad Cos.

RUBBER SPRINGS—Bearing and Buffer—Fuller's Patent—Hose from 1 to 12 inches diameter. Suction Hose. Steam Packing—from 1-16 to 2 in. thick. Rubber and Gutta Percha Bands. These articles are all warranted to give satisfaction, made under Tyer & Helm's patent, issued January, 1849.—No lead used in the composition. Will stand much higher heat than that called "Goodyear's," and is in all respects better than any in use. Proprietors of railroads do not be overcharged by pretenders.

HORACE H. DAY,

Warehouse 23 Courtlandt street.

New York, May 21, 1849.

To Railroad Companies and Contractors.

FOR SALE.—Two Locomotive Engines and Tenders, at present in use on the Beaver Meadow Railroad, being too light for their coal trains, but well calculated for either gravel or light passenger trains.

They weigh, in running order, about 8 tons each—having one pair of driving wheels 4 feet diameter, 4 truck wheels 30 inches diameter, with cylinders 10 in. diameter, and 18 inches stroke of piston. Tenders on 4 wheels. Address **JAMES ROWLAND,**
Prest. Beaver Meadow Railroad & Coal Co., Philadelphia.

or, **L. CHAMBERLAIN,** Sec'y,

at Beaver Meadow, Pa.

May 19, 1849.

Rosendale Cement.

THE NEWARK AND ROSENDALE LIME AND CEMENT CO. are now manufacturing at their works in NEWARK, N. J., and Ulster county, N.Y., a very superior article of Hydraulic Cement—also Lime Calcine Plaster, etc. Contractors and dealers will find it to their advantage to call or make application before purchasing elsewhere. All communications addressed to the subscriber, at Newark, N.J., will be punctually attended to.

1y*15

HENRY WILDE, Secretary.

Fire Brick.

THE Subscribers have constantly on hand Rafford's Stourbridge, Oak Farms Stourbridge, Lister, Wortley, Red and White Welsh Fire Bricks, common and fancy shapes. Also,

ROOFING SLATES,

from the best Welch quarries, and of all sizes. Also, COAL,

of all kinds—Liverpool Orrell and Cannel, Scotch, New Castle, Pictou, Sidney, Cumberland, Virginia, and all kinds of Anthracite coals. Also,

Pig Iron, Salt, etc., etc., for sale at the lowest market price. Apply to

SAMUEL THOMPSON & NEPHEW,
275 Pearl and 43 Gold Sts., New York.

November, 23, 1849.

**NORRIS' LOCOMOTIVE WORKS,
SCHENECTADY, N. Y.**

THESE Works are in full operation in Manufacturing to order, Locomotive Steam Engines & Tenders, of the best principle and construction of material, using wrought iron heavy frames with pedestals welded thereto, and all parts of the engine made of the best wrought iron, except cylinders, pumps and boxes—obtaining greater durability, and carrying less weight over the road, than engines constructed of cast iron.

Wrought Iron Tires made any required size, and Tire Bars bent and welded with dispatch.

Chilled Wheels for Cars, Trucks and Tenders, made from the toughest iron.

Driving and Tender and Car Wheels fitted to Axles with Brass Boxes and Springs, and Railroad Machinery generally. Manufactured and for sale by

April 11, 1849. E. S. NORRIS.

**To the Proprietors of Rolling
Mills and Iron Works.**

THE Undersigned—Proprietors of Townsend's Furnace and Machine Shop, Albany—are extensively engaged in the manufacture of Machinery and fixtures for Iron, and Copper Rolling Mills, and Iron Works. Having paid particular attention to the manufacture of *Rolls* (Rollers), both *chilled* and *dry-sand*, they feel confident that they can execute orders for such castings in a satisfactory manner. And to give assurance of this, they beg leave to refer to the following named persons, proprietors and managers of some of the most extensive rolling mills in the country, viz: Jno. F. Winslow, J. Tuckerman, H. Burden, W. Burr, J. & J. Rogers, Saltus & Co., J. B. Bailey, L. G. B. Cannon, Hawkins & Atwater, etc., etc.

F. & T. TOWNSEND.

Albany, August 18, 1849.

Passenger Car Linings.

THE Advertiser continues to make to order the Enamelled Car Linings which have been so highly approved the last three years, and are now exclusively used by all the Northern Railroads. No pains are spared to get out new styles, and adapt them to the tastes of every consumer.

Orders addressed to CHARLES STODDER, No. 75 Kilby street, Boston, will have prompt attention.
March 23, 1850. 2m

CAUTION.

RAILROAD COMPANIES and others are hereby cautioned against using or vending our improvement for easing the lateral motion as applied on Railroad Cars. Letters Patent having been granted to us in 1841, any party or parties so making or using said improvement without license from us will be proceeded against according to law.

DAVENPORT & BRIDGES.

Doremus & Nixon,
IMPORTERS AND FURNISHERS
OF

**RAILROAD CAR
AND COACH TRIMMINGS.**

Plain Garnet Plush. Fig. Garnet Plush (Butterfly pat.
"Crimson" "Crimson" (Elegant.
"Scarlet" " " (Gen. Taylor.

BROCATELLES.

Crimson Silk Brocatelles. Gold and Maroon do.
Gold and Blue " " Brown "
Silk and Wool " " of every color.

MOQUETTES.

Of elegant designs and colors.

GERMAN CLOTH FOR CAR LININGS.

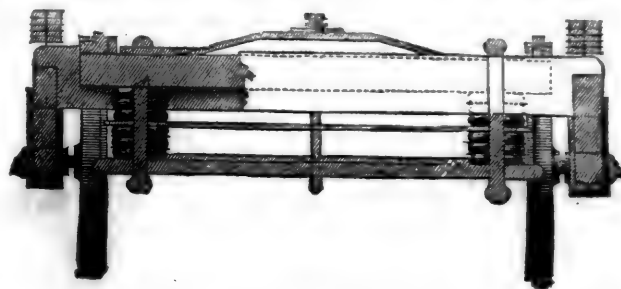
The most beautiful goods ever shown in this country, and the subscribers are the sole agents for the sale of them.

Oil cloths Enamelled with Gold. These goods can be
" " Silver. furnished in any
Do. Silver ground velvet printed. dimensions req'd.

CURLED HAIR

Of every description and quality.

JNO. W. A. STRICKLAND, Agent.
New York, 1850. 1y16

**FULLER'S PATENT
INDIA RUBBER CAR SPRINGS.**

RAILROAD COMPANIES are cautioned, before purchasing Springs, to examine the actual patents and judge for themselves.

Persons, under the Title of the New England Car Company, seeking fraudulently to invade Fuller's rights have put forth so many statements for the purpose of misleading the public, that an enumeration of some facts is absolutely necessary, for the purpose of putting persons interested upon their guard.

Fuller's patent is for the application of Discs of India-rubber with Metal Plates, for forming Springs for Railway Cars and Carriages—either one disc and two plates, or ten discs and plates, or any other number, are equally covered by the patent. Fuller is not bound to the use of short discs—he may use long discs and plates.

Ray's patent is simply and wholly the forming of air tight rubber cylinders, with hoops or bands round the outside, and the combination of elasticity of India rubber, with the elasticity of atmospheric air confined in the cylinder, and in no part of his patent is he authorized to use the form of spring which he is now fraudulently supplying to Railroad Companies. Such springs are direct and positive infringements of the very letter of Fuller's patent.

Fuller's patent is dated October, 1845, Ray's patent, August, 1848.

The spring patented by Ray never has been put in operation, and never can be made useful for Railroad cars.

A mere experiment, even if made, it is well known does not prove an invention; and it is ridiculous for such parties to hope to mislead the Presidents and Superintendents of Railroad companies, by claiming the invention because Ray alleges he made an experiment—which Fuller had made before him—had actually brought into working order, and obtained a patent for—and this too before Mr. Ray states he made his experiment—and that experiment not claimed to have been applied to a car or carriage.

Besides, the invention could not have been developed until India rubber, properly Vulcanised, could be made of a sufficient thickness. In the United States the art of vulcanising rubber by steam heat, (by which

means only can a body of rubber having any considerable thickness be vulcanised,) was not introduced until after the grant by the American government of the patent for springs to Fuller—whereas the process of vulcanising rubber by steam heat was invented in England about three years previously, and was used by Fuller there. This fact refutes entirely the claim of invention put forth by Mr. Ray, and proves the impossibility of his pretensions being true.

Fuller was the first and only inventor of the spring. A Mr. Dorr, whose connection with Mr. Goodyear is well known in this country, applied in England to Mr. Fuller, after he had published and patented his invention, and introduced another party for the purpose of obtaining the agency for the United States. They were furnished with a complete set of drawings and models, and with instructions to make arrangements for the supply of material of American manufacture—from that hour to the present not a single communication has been received from them. Some of these identical models have been traced into the hands of parties now seeking to invade Fuller's rights, and who have exhibited them as specimens of their own invention.

After this, the conveyance was made by Goodyear to certain parties here for the use for railroad springs of what he calls his Metallic rubber. Comment is unnecessary.

There are 5 or 6 different processes for the manufacture of vulcanised rubber, patented by as many different parties, some here, some in England, either of which would probably make good springs.

A large and powerful company has been organised under the name of "The Rubber Spring Co.", the particulars of which shall be given.

An action has been commenced against three railroad companies for infringement; and all other parties will assuredly be prosecuted if they continue farther to infringe upon Fuller's patent.

W. C. FULLER,

The only persons authorised to supply the Springs are
G. M. KNEVITT, 38 Broadway, N. York,
General Agent for the U. S.; and
JAS. LEE & Co., 18 India Wharf, Boston.
JOHN THORNLEY, Chestnut st., Philad.

**Patent India Rubber Steam
Packing.**

THIS article, made by the subscriber, who alone is authorised to make it, is warranted to stand as high a degree of heat as any that has been or can be made by any person—and is the article which has made the reputation of India Rubber Steam Packing and the demand therefor. A large assortment of all thicknesses requisite for any description of engines, steam pipes, valves, etc., constantly on hand and for sale by the manufacturer and patentee, who will give every information regarding its properties, mode of use, etc. at the warehouse. JOHN GREACHEN, JR.,
98 Broadway, opposite Trinity Church.
New York, October, 1849.

**IBBOTSON, Brothers & Co's
CELEBRATED CAST STEEL**

AND

Best Cast Steel Royal Improved Files, well known as better adapted for Engineers' and Machinists' purposes than any now in use in the United States.

Every description of Square, Octagon, Flat and Round Cast Steel, Sheet, Shovel and Railway Spring Steel, etc., and Steel to order for any purpose—manufactured at their works in Sheffield—and universally known by the old stamp "Globe."

HENRY J. IBBOTSON, Agent,
218 Pearl st., New York.

February 25, 1850.

FAIRBANKS' RAILROAD SCALES.—THE subscribers are prepared to construct at short notice, *Railroad and Depot Scales*, of any desired length and capacity. Their long experience as manufacturers—their improvements in the construction of the various modifications, having reference to strength, durability, retention of adjustment, accuracy of weight and dispatch in weighing—and the long and severe tests to which their scales have been subjected—combine to ensure for these scales the universal confidence of the public.

No other scales are so extensively used upon railroads, either in the United States or Great Britain;—and the managers refer with confidence to the following in the United States.

Eastern Railroad. Boston & Maine Railroad.
Providence Railroad. Providence and Wor. Road.
Western Railroad. Concord Railroad.
Old Colony Railroad. Fitchburg Railroad.
Schenectady Railroad. Syracuse and Utica Road.
Balt. and Ohio Railroad. Baltimore and Susq. Road.
Phila. & Reading Road. Schuylkill Valley Road.
Central (Ga.) Railroad. Macon and Western Road.
New York and Erie Railroad.

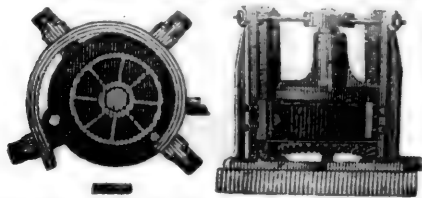
And other principal Railroads in the Western, Middle and Southern States.

E. & F. FAIRBANKS & CO.
St. Johnsbury, Vt.

Agents, } FAIRBANKS & Co., 81 Water St., N. York.
} A. B. NORRIS, 196 Market St. Philadelphia.
April 22, 1849. 1y*17

MACHINERY.

Henry Burden's Patent Revolving Shingling Machine.



THE Subscriber having recently purchased the right of this machine for the United States, now offers to make transfers of the right to run said machine, or sell to those who may be desirous to purchase the right for one or more of the States.

This machine is now in successful operation in ten or twelve iron works in and about the vicinity of Pittsburgh, also at Phoenixville and Reading, Pa., Covington Iron Works, Md., Troy Rolling Mills, and Troy Iron and Nail Factory, Troy, N. Y., where it has given universal satisfaction.

Its advantages over the ordinary Forge Hammer are numerous: considerable saving in first cost; saving in power; the entire saving of shingler's, or hammerman's wages, as no attendance whatever is necessary, it being entirely self-acting; saving in time from the quantity of work done, as one machine is capable of working the iron from sixty puddling furnaces; saving of waste, as nothing but the scoria is thrown off, and that most effectually; saving of staffs, as none are used or required. The time required to furnish a bloom being only about six seconds, the scoria has no time to set, consequently is got rid of much easier than when allowed to congeal as under the hammer. The iron being discharged from the machine so hot, rolls better and is much easier on the rollers and machinery. The bars roll sounder, and are much better finished. The subscriber feels confident that persons who will examine for themselves the machinery in operation, will find it possesses more advantages than have been enumerated. For further particulars address the subscriber at Troy, N. Y. P. A. BURDEN.

Railroad Spikes and Wrought Iron Fastenings.

THE TROY IRON AND NAIL FACTORY, exclusive owner of all Henry Burden's Patented Machinery for making Spikes, have facilities for manufacturing large quantities upon short notice, and of a quality unsurpassed.

Wrought Iron Chairs, Clamps, Keys and Bolts for Railroad fastenings, also made to order. A full assortment of Ship and Boat Spikes always on hand.

All orders addressed to the Agent at the Factory will receive immediate attention.

P. A. BURDEN, Agent,
Troy Iron and Nail Factory, Troy, N. Y.

RAILROAD WHEELS.

CHILLED RAILROAD WHEELS.—THE UNDERSIGNED are now prepared to manufacture their Improved Corrugated Car Wheels, or Wheels with any form of spokes or discs, by a new process which prevents all strain on the metal, such as is produced in all other chilled wheels, by the manner of casting and cooling. By this new method of manufacture, the hubs of all kinds of wheels may be made whole—that is, without dividing them into sections—thus rendering the expense of banding unnecessary; and the wheels subjected to this process will be much stronger than those of the same size and weight, when made in the ordinary way.

A. WHITNEY & SON,
Willow St., below 13th,
Philadelphia, Pa.

CHILLED RAILROAD WHEELS.—THE UNDERSIGNED, the Original Inventor of the Plate Wheel with solid hub, is prepared to execute all orders for the same, promptly and faithfully, and solicits a share of the patronage for those kind of wheels which are now so much preferred, and which he originally produced after a large expenditure of time and money.

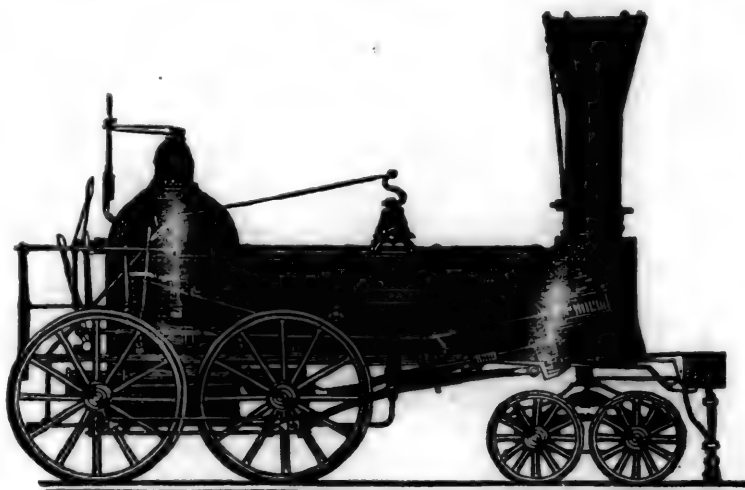
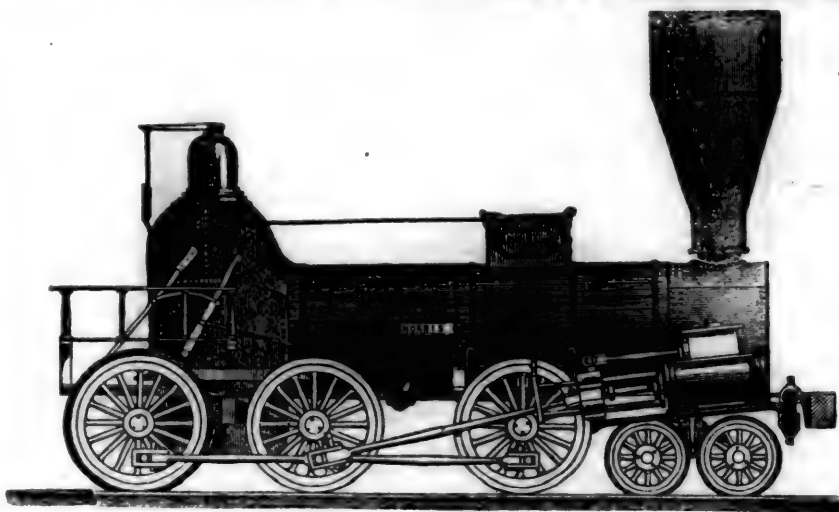
A. TIERS,
Point Pleasant Foundry.

He also offers to furnish Rolling Mill Castings, and other Mill Gearing, with promptness, having, he believes, the largest stock of such patterns to be found in the country.

Kensington, Philadelphia Co., }
March 12, 1848. }

NORRIS' LOCOMOTIVE WORKS.

BUSHHILL, SCHUYLKILL SIXTH-ST., PHILADELPHIA,



THE UNDERSIGNED Manufacture to order Locomotive Steam Engines of any plan or size. Their shops being enlarged, and their arrangements considerably extended to facilitate the speedy execution of work in this branch, they can offer to Railway Companies unusual advantages for prompt delivery of Machinery of superior workmanship and finish.

Connected with the Locomotive business, they are also prepared to furnish, at short notice, Chilled Wheels for Cars of superior quality.

Wrought Iron Tyres made of any required size—the exact diameter of the Wheel Centre, being given, the Tyres are made to fit on same without the necessity of turning out inside.

Iron and Brass castings, Axles, etc., fitted up complete with Trucks or otherwise.

NORRIS, BROTHERS

LAWRENCE'S ROSENDALE HYDRAULIC Cement. This Cement is warranted equal to any manufactured in this country, and has been pronounced superior to Francis' "Roman." Its value for Aqueducts, Locks, Bridges, Floors, and all Masonry exposed to dampness, is well known, as it sets immediately under water, and increases in solidity for years.

For sale in lots to suit purchasers, in tight papered barrels, by

JOHN W. LAWRENCE,

142 Front-street, New York.

Orders for the above will be received and promptly attended to at this office. 32 ly.

PATENT MACHINE MADE HORSE-SHOES.

The Troy Iron and Nail Factory have always on hand a general assortment of Horse Shoes, made from Refined American Iron.

Four sizes being made, it will be well for those ordering to remember that the size of the shoe increases as the numbers—No. 1 being the smallest.

P. A. BURDEN, Agent,
Troy Iron and Nail Factory, Troy, N. Y.

COLUMBUS, OHIO, Railroad Car Manufactory. RIDGWAYS & KIMBALL,

HAVE established at this central point, the manufacture of Passenger, Freight, Gravel and Hand Cars for Railroads, and assure all Western Railroad Companies that it will be their constant aim to procure the best materials and workmen, and to turn out the best kind of work at fair prices. Specimens may be seen on the Columbus and Xenia Railroad. The patronage of Railroad Companies is respectfully solicited. 1y8

To Inventors and Patentees.

OWEN G WARREN, ARCHITECT, Has had many years' experience as Agent for obtaining Patents, both in this country and Europe, and will transact such business promptly and reasonably. Persons at a distance can have their business done by correspondence—without the necessity of visiting this city or Washington. Office No. 94 Merchants Exchange, Wall st., corner of Hanover st., up stairs. 1y3

AMERICAN RAILROAD JOURNAL.

STEAM NAVIGATION, COMMERCE, MINING, MANUFACTURES.

HENRY V. POOR, Editor.

ESTABLISHED 1831.

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SATURDAY, MAY 18, 1850.

[WHOLE No. 735, VOL. XXIII.]

ASSISTANT EDITORS,

J. T. HODGE, *For Mining and Metallurgy.*
GEN. CHAS. T. JAMES, *For Manufactures and the
Mechanic Arts.*
M. BUTT HEWSON, C. E., *For Civil Engineering.*

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American Railroad Journal.

PUBLISHED BY J. H. SCHULTZ & Co., 136 NASSAU ST.

Saturday, May 18, 1850.

Lake Superior Copper Mines, CAPE MINE.

I alluded in a late number of the Journal to the arrangements in progress for greater facilities of communication the coming season with the copper region of Lake Superior, and to the increased confidence thereby indicated in the permanent resources of the country. I since learn that besides the boats of Mr. McKnight, it is probable the fine passenger propeller Manhattan, or the steamer Sam Ward, will be put upon the route from Detroit to the copper region; the latter to run between Detroit and the Sault, and the former after being taken over the portage in the spring to complete the route to the upper country. To sustain these lines of boats the business of the country must be considerably increased beside the natural extension of that of

each company now in operation. It is evident the owners of the boats are looking forward to new mining enterprises and to new permanent settlements. The results of the operations of the last year, the very favorable accounts brought by each monthly mail the present year, and the movements made in our cities in forming new associations, warrant these anticipations. I shall endeavor to keep up a nearly complete account of these new operations as well as of the progress of those of the old companies.

I have before stated that several entries were made the last fall of tracts on Keewenaw Point.—On these I understand new explorations are about to be commenced by several companies. They are in a district, which I examined with considerable care the last season, but which was only very generally described in my account of the workings of the Cliff, North American, North Western and North West companies. This district may be defined as the southern slope of the range of trap hills which extends along the Point nearly parallel with its northern shore and from three to four miles back from it. The accompanying map with its township and section lines, similar to those of the map of the Ontonagon district published in the number of the Journal for December 1, 1849, will convey a clear idea of the topography of the country, and of the relative positions of the different mines. It is compiled mostly from the government surveys.

All the mines on the Point, that have continued in successful operation, are on the southern slope of the central range of trap hills. These hills at their summits consist of layers of compact greenstone trap, which incline more steeply than their northern slopes towards the lake. Beneath the greenstone trap where the almost vertical southern face of the cliffs gives place to a more gentle inclination, a band of red conglomerate comes out to the surface and may be traced in this position from Eagle River almost to the extremity of the Point. West of Eagle River I have not recognised this belt of rock. At the Cliff mine, the compact trap is underlaid by a seam of quartz more like a vein itself, than a stratum of rock. But at the mines east of this the conglomerate is always found and in this particular position. In thickness it is not known to exceed thirty feet, and is sometimes much thinner. It is frequently cut through by the exploring shafts of the mining companies, as at the Winthrop, the North Western and North West mines.

Below the conglomerate is the greyish trap rock, most commonly amygdaloidal, in which the veins are alone found productive. The thickness of this belt has never been ascertained.

The veins are nearly vertical and cross the ridges at right angles, cutting all these different belts of rock. On the summits they are seen inclosed in the compact trap, where this is uncovered; they are finely exposed to view in the steep southern cliffs and are traced through the conglomerate, pursuing their course far down into the amygdaloid below. Being true veins their limits will never be found. They consist of various veinstones, which I have before named—the principal one quartz. In the greenstone trap they contain only small particles of copper interspersed through the quartz; in the conglomerate they are no better—some copper still accompanies them, found scattered in thin sheets like foil among the pebbles, of which this rock is composed. It is only in the amygdaloid or greyish trap below, that the veins when opened to some depth produce the rich masses and stamp work. Along the narrow belt where this rock comes to the surface is therefore the only range in which to seek with confidence for productive veins.

One of the new tracts in this position purchased of the government the last fall, and on which mining explorations are soon to be commenced, is called the "Cape Mine," from its situation near the extremity of Point or Cape Keewenaw. This is now owned by the "Cape Mine Association," so called, of Philadelphia, for which I have prepared a report, of which the following is the substance.

This tract, which is the southwest quarter of section seven of town fifty eight north, range twenty eight west, is situated about two and a half miles in a straight line from the western extremity of Copper Harbor. Here on the east side of a great gap, through the ridge, in a position singularly like that of the North American vein now worked, is seen in the vertical face of the trap rock a great vein of quartz and chlorite, four to five feet thick—the veinstones arranged in alternating layers parallel with the walls of the vein, and interspersed (the quartz particularly) with small particles of native copper. In external appearance the vein is a remarkable one for its size, its fine exposure, its connection with the great gap through the ridge and with other signs of disturbance, which are noticed about all the productive veins—as numerous

fissures through the rocks around and little feeders or branches connected with the main vein. The veinstones themselves similar to those of the best veins of the country, are as rich in copper as any, I believe, found in the compact greenstone trap. Here only and in the conglomerate, which comes to the surface in the more gentle slope immediately beneath, have any mining explorations been made. These are very superficial, and would have determined nothing more than what is seen at the surface, even if they had been in the proper rock, which they are not. This lies a little farther down the hill, forming a terrace, which is very conveniently situated for mining operations, and for drainage to a moderate depth by an adit level.— This is of great consequence to take off the surface water, which in these rocks is nearly all that penetrates into the deeper workings. The greyish trap below much resemble that of the Northwest mine adjoining the productive portion of the *Stoutenburg* vein. So far as it is exposed, the vein seen a few rods above in the compact trap does not present itself to view on its range through this lower belt.— It may have been thrown to one side in passing through the conglomerate, as the Cliff vein is heaved by the layer of rock occupying the same position as this conglomerate; or it may be concealed beneath a cap of grey trap, as the magnetic iron ore veins of New Jersey and northern New York are frequently lost sight of and then recovered. The vein as seen in the trap above is of too decided a character to admit of its running out, or being in any way lost except by local displacement—a feature to which veins in all countries are subject, and which, though it sometimes involves considerable search, can in no wise be regarded as having any unfavorable influence upon their productiveness or permanence. In this instance, in case the vein is not detected in clearing off the surface, I should have little doubt of soon finding it by sinking a shaft in the rock nearly on its range, and then at the depth of twenty or thirty feet drifting east and west until it is cut. On further examination it may be found more expedient to sink a succession of small experimental shafts here and there across the line of its range. This may prove the more economical plan, the other is more certain. Either is not likely to involve an expense of more than a few hundred dollars before the vein is found.

The accompanying figure (1) is a vertical cross section on the plane of the vein, showing the outline of the ridge, the steep pitch of its southern face, and the gentler slope of its northern side. It represents also the relative position of the three belts of rock and the point, marked by the windlass, where mining operations may judiciously be commenced. Figure 2 is a front outline view of the Cliff, showing the position of the vein, and the gap through the ridge. The vein is designated by the upright blank lines in the Cliff on the east side of the gap.

Veins of the character of this admit of no previous estimates, as to their productiveness. One forms a judgement of them by comparison of the features they present, with those the best veins of the country displayed at a similar stage of their development. In this comparison, taking in all the circumstances of position, character of the veinstones in the compact trap, as also of this rock immediately adjoining the vein, the size of the vein and its metalliferous contents, I cannot but regard it as one of the most promising points yet unproved now known in the country; and in this opinion I am confirmed by that of several practical men

who have explored this region and expressed to me their views.

Beside the promise of the vein itself the situation of the tract is peculiarly favorable for carrying on mining operations with economy. By reference to the accompanying map of the Point, it will be seen that the coast line following the indentations of Copper Harbor, approaches as near the trap range at this point as at any other. This is of the greatest importance in a region where roads are so expensive to make, and where a constant communication must be had with some convenient harbor. Of all those on the coast of Lake Superior, none, I believe, are preferred to Copper Harbor. It is the nearest to the foot of the lake of all the harbors connected with the copper mines, it is the most capacious, is already provided with a lighthouse at its entrance, and has the best dock and landing place, which is at the nearest point of the harbor to the Cape mine. Here too are convenient dwelling and store houses and a postoffice. To reach this point from the mine, a road passing through the gap near the vein would necessarily be somewhat longer to avoid the conglomerate hills, than the straight line of two and a half miles. It can probably be well made within four miles. On the other side of the Point the mine is almost equally near the shore of the lake on the fine Bay de Gris where vessels may safely lie protected from all northerly winds. No portion of the trap range can be much better situated for facilities of shipment of ores and receiving supplies than this.

The Little Montreal river which passes along south of the tract is here too deep a stream to be forded. Its course is interrupted by occasional water falls which may furnish power for stamp and saw mills. Along its banks is abundance of large white pine, which with the heavy growth of maple, birch, oak and hemlock, indicates a strong and fertile soil, such as almost everywhere accompanies the trap formation. Near its mouth are several steep pitches, first over conglomerate and below over ledges of trap rock. The lowest of them, which are directly above the shore of the lake, are estimated by the government surveyors to be 23 ft. in height. They are owned by the same association as the Cape mine itself; and in connection with this mine they may prove of no small consequence as a valuable site for mills for stamping the ores or for saw mills—especially should it be found that a shelter can be made for vessels against the southeast winds, which the form of the coast seems to render not unlikely.

We have received the following account of the organization of the Cape Mine Association:

At a meeting of the stockholders of the "Cape Mine Association," held in Philadelphia, Pa., at the office, No. 26 South Third street, (2d floor)—three fourths of the stock being represented—Jacob M. Thomas was called to the chair, and Fred. Fairthorne appointed secretary.

The report of Mr. Hodge was read and approved, and ordered to be published in the Railroad Journal.

Information was laid before the meeting that a charter has been obtained for this company: and that the mine lands situated on Point, or Cape Keewenaw, upon the southern slope of the main "trap range" have been bought of the U. S. government—and the "patents" were produced to the meeting.

Also that there is in the treasury of the Association \$2,000 of working capital with which to prove the copper bearing "lode."

The following officers were unanimously elected:

MANAGERS.

William Coffin, of Philadelphia.
Geo. M. Flemming, "
Wm. Pettit, "
John C. Bullitt, "
Davie Samuel, "
D. D. Brockway, of Michigan.

SECRETARY.

Fred. Fairthorne.

TREASURER.

Wm. Pettit.

General business office, No. 26 South Third St., (2d floor) Philadelphia, Pa.

Adjourned, *sine die*.

JACOB M. THOMAS, Chairman.

FRED. FAIRTHORNE, Secretary.

Philadelphia, April 18, 1850.

German Railways--Their History, Extent, Cost, &c.

Germany, with its generally even surface and sandy soil, is perhaps as well adapted to the easy and cheap construction of railways as any country of the globe, and it seems to need them as much as any. It has few navigable rivers upon which to send the swift messengers of commerce and civilization, and it is fortunately, or unfortunately, divided into numerous sovereignties, the political and commercial relations of whose capitals require frequent and speedy communication between them. It possesses an intelligent, industrious population, whose convenience and whose interests equally demand facility of intercourse. It is not strange therefore that the attention of the German governments was early turned to the construction of railroads as the best means of subserving these ends.

Austria merits the honor of first introducing them by construction of the road from Budweis to Linz, a distance of about 70 American miles. Upon this road the trains have been drawn by horses, and it is probably the only one of any considerable length upon which this species of motive power is now in use. This road was opened in 1828, one year before locomotives were first employed for passenger trains upon the Birmingham and Manchester road. The short road from Nursenburg to Furth, in the Kingdom of Bavaria, was that upon which the first locomotive in Germany was used. It was opened a few years after that from Budweis to Linz, and is one of the most profitable in the country, paying from 13 to 15 per cent. while the others average not over 4 to 5 per cent.

The plan adopted in constructing her system of railways was to make and put in operation those portions of roads which presented fewest obstacles, and then concentrating forces upon those parts more difficult. This course gave her at one time a multiplicity of isolated lines, apparently without plan or system, but the completion of the remaining portions have now united them, presenting an extensive and well arranged network of railway.

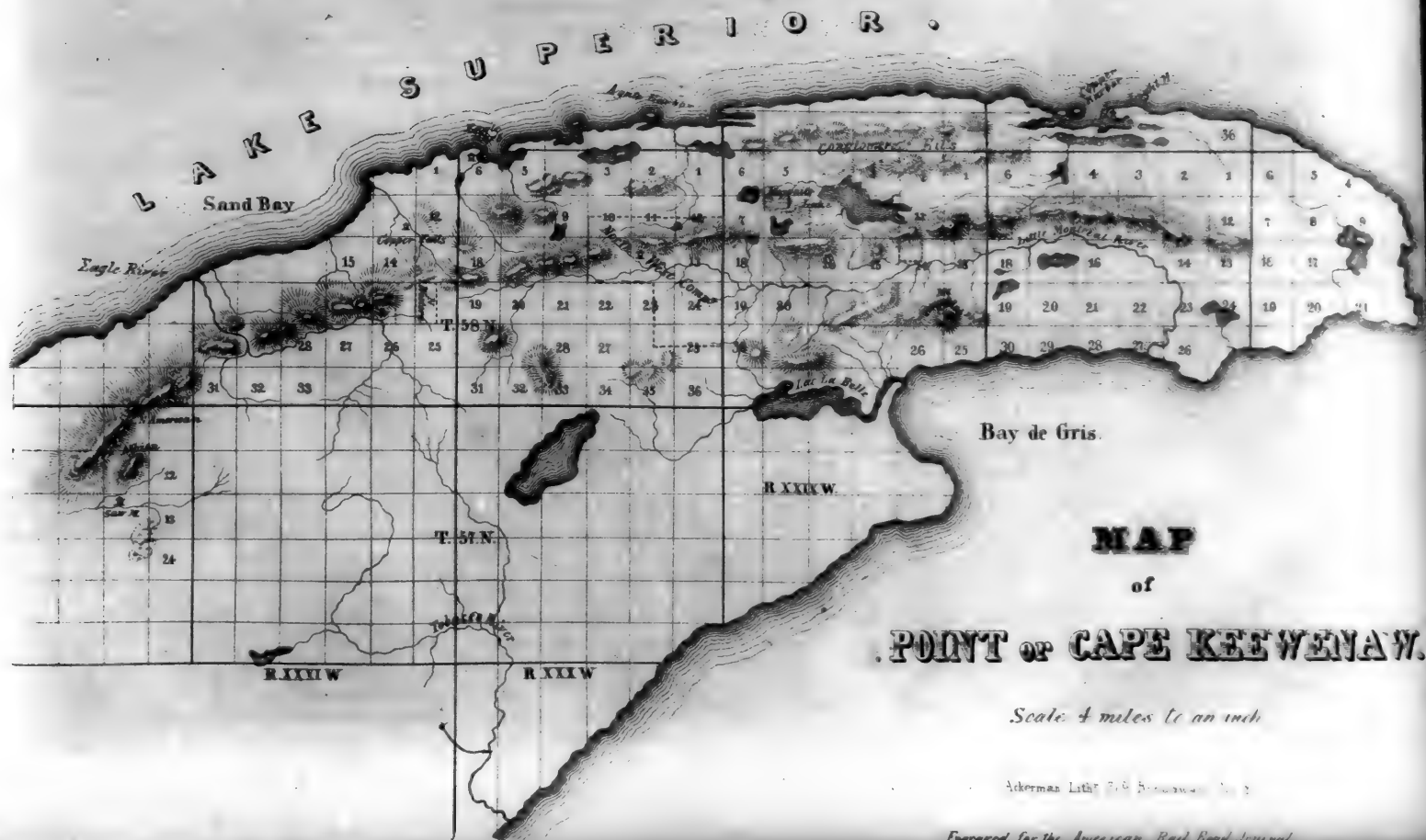
By far the larger part of these roads had been constructed by the different governments—Prussia alone of them all has refrained entirely from the undertaking. She has, however, aided their construction by guarantying interest to chartered companies, and has thus supplied herself with a greater extent of railway than any other of the German States possess. Her roads are superior in structure and management to those of the other States, and have been built at an average less cost per mile, a pretty good evidence that here, as in America, companies are better adapted to the construction of such enterprises than governments.

Austria, Bavaria and other States have construct-



Explanation.

- a Vein.
- b Compact Trap.
- c Conglomerate.
- d Amygdaloidal.



fractures through the rocks around and little feeders or branches connected with the main vein. The vein-stones themselves similar to those of the best veins of the country, are as rich in copper as any, I believe, found in the compact greenstone trap. Here only and in the conglomerate, which comes to the surface in the more gentle slope immediately beneath, have any mining explorations been made. These are very superficial, and would have determined nothing more than what is seen at the surface, even if they had been in the proper rock, which they are not. This lies a little farther down the hill, forming a terrace, which is very conveniently situated for mining operations, and for drainage to a moderate depth by an adit level.—This is of great consequence to take off the surface water, which in these rocks is nearly all that penetrates into the deeper workings. The greyish trap below much resembles that of the Northwest mine adjoining the productive portion of the *Stoutenburg* vein. So far as it is exposed, the vein seen a few rods above in the compact trap does not present itself to view on its range through this lower belt.—It may have been thrown to one side in passing through the conglomerate, as the *Cliff* vein is heaved by the layer of rock occupying the same position as this conglomerate; or it may be concealed beneath a cap of grey trap, as the magnetic iron ore veins of New Jersey and northern New York are frequently lost sight of and then recovered. The vein as seen in the trap above is of too decided a character to admit of its running out, or being in any way lost except by local displacement—a feature to which veins in all countries are subject, and which, though it sometimes involves considerable search, can in no wise be regarded as having any unfavorable influence upon their productiveness or permanence. In this instance, in case the vein is not detected in clearing off the surface, I should have little doubt of soon finding it by sinking a shaft in the rock nearly on its range, and then at the depth of twenty or thirty feet drifting east and west until it is cut. Or on further examination it may be found more expedient to sink a succession of small experimental shafts, here and there across the line of its range. This may prove the more economical plan, the other is more certain. Either is not likely to involve an expense of more than a few hundred dollars before the vein is found.

The accompanying figure (1) is a vertical cross section on the plane of the vein, showing the outline of the ridge, the steep pitch of its southern face, and the gentler slope of its northern side. It represents also the relative position of the three belts of rock and the point, marked by the windlass, where mining operations may judiciously be commenced. Figure 2 is a front outline view of the *Cliff*, showing the position of the vein, and the gap through the ridge. The vein is designated by the upright blank lines in the *Cliff* on the east side of the gap.

Veins of the character of this admit of no previous estimates, as to their productiveness. One forms a judgement of them by comparison of the features they present, with those the best veins of the country displayed at a similar stage of their development. In this comparison, taking in all the circumstances of position, character of the vein-stones in the compact trap, as also of this rock immediately adjoining the vein, the size of the vein and its metalliferous contents, I cannot but regard it as one of the most promising points yet unproved now known in the country; and in this opinion I am confirmed by that of several practical men

who have explored this region and expressed to me their views.

Beside the promise of the vein itself the situation of the tract is peculiarly favorable for carrying on mining operations with economy. By reference to the accompanying map of the Point, it will be seen that the coast line following the indentations of Copper Harbor, approaches as near the trap range at this point as at any other. This is of the greatest importance in a region where roads are so expensive to make, and where a constant communication must be had with some convenient harbor. Of all those on the coast of Lake Superior, none, I believe, are preferred to Copper Harbor. It is the nearest to the foot of the lake of all the harbors connected with the copper mines, it is the most capacious, is already provided with a lighthouse at its entrance, and has the best dock and landing place, which is at the nearest point of the harbor to the Cape mine. Here too are convenient dwelling and store houses and a postoffice. To reach this point from the mine, a road passing through the gap near the vein would necessarily be somewhat longer to avoid the conglomerate hills, than the straight line of two and a half miles. It can probably be well made within four miles. On the other side of the Point the mine is almost equally near the shore of the lake on the fine Bay de Gris where vessels may safely lie protected from all northerly winds. No portion of the trap range can be much better situated for facilities of shipment of ores and receiving supplies than this.

The Little Montreal river which passes along south of the tract is here too deep a stream to be forded. Its course is interrupted by occasional water falls which may furnish power for stamp and saw mills. Along its banks is abundance of large white pine, which with the heavy growth of maple, birch, oak and hemlock, indicates a strong and fertile soil, such as almost everywhere accompanies the trap formation. Near its mouth are several steep pitches, first over conglomerate and below over ledges of trap rock. The lowest of them, which are directly above the shore of the lake, are estimated by the government surveyors to be 23 ft. in height. They are owned by the same association as the Cape mine itself; and in connection with this mine they may prove of no small consequence as a valuable site for mills for stamping the ores or for saw mills—especially should it be found that a shelter can be made for vessels against the southeast winds, which the form of the coast seems to render not unlikely.

We have received the following account of the organization of the Cape Mine Association:

At a meeting of the stockholders of the "Cape Mine Association," held in Philadelphia, Pa., at the office, No. 26 South Third street, (2d floor)—three fourths of the stock being represented—Jacob M. Thomas was called to the chair, and Fred. Fairthorne appointed secretary.

The report of Mr. Hodge was read and approved, and ordered to be published in the Railroad Journal.

Information was laid before the meeting that a charter has been obtained for this company: and that the mine lands situated on Point, or Cape Keewenaw, upon the southern slope of the main "trap range" have been bought of the U. S. government—and the "patents" were produced to the meeting.

Also that there is in the treasury of the Association \$2,000 of working capital with which to prove the copper bearing "lode."

The following officers were unanimously elected:

MANAGERS.

William Coffin, of Philadelphia.
Geo. M. Flemming, "
Wm. Pettit, "
John C. Bullitt, "
Davie Samuel, "
D. D. Brockway, of Michigan.

SECRETARY.

Fred. Fairthorne.

TREASURER.

Wm. Pettit.

General business office, No. 26 South Third St., (2d floor) Philadelphia, Pa.

Adjourned, *sine die*.

JACOB M. THOMAS, Chairman.

FRED. FAIRTHORNE, Secretary.

Philadelphia, April 18, 1850.

German Railways--Their History, Extent, Cost, &c.

Germany, with its generally even surface and sandy soil, is perhaps as well adapted to the easy and cheap construction of railways as any country of the globe, and it seems to need them as much as any. It has few navigable rivers upon which to send the swift messengers of commerce and civilization, and it is fortunately, or unfortunately, divided into numerous sovereignties, the political and commercial relations of whose capitals require frequent and speedy communication between them. It possesses an intelligent, industrious population, whose convenience and whose interests equally demand facility of intercourse. It is not strange therefore that the attention of the German governments was early turned to the construction of railroads as the best means of subserving these ends.

Austria merits the honor of first introducing them by construction of the road from Budweis to Linz, a distance of about 70 American miles. Upon this road the trains have been drawn by horses, and it is probably the only one of any considerable length upon which this species of motive power is now in use. This road was opened in 1828, one year before locomotives were first employed for passenger trains upon the Birmingham and Manchester road. The short road from Nursenburg to Furth, in the Kingdom of Bavaria, was that upon which the first locomotive in Germany was used. It was opened a few years after that from Budweis to Linz, and is one of the most profitable in the country, paying from 13 to 15 per cent. while the others average not over 4 to 5 per cent.

The plan adopted in constructing her system of railways was to make and put in operation those portions of roads which presented fewest obstacles, and then concentrating forces upon those parts more difficult. This course gave her at one time a multiplicity of isolated lines, apparently without plan or system, but the completion of the remaining portions have now united them, presenting an extensive and well arranged network of railway.

By far the larger part of these roads had been constructed by the different governments—Prussia alone of them all has refrained entirely from the undertaking. She has, however, aided their construction by guarantying interest to chartered companies, and has thus supplied herself with a greater extent of railway than any other of the German States possess. Her roads are superior in structure and management to those of the other States, and have been built at an average less cost per mile, a pretty good evidence that here, as in America, companies are better adapted to the construction of such enterprises than governments.

Austria, Bavaria and other States have construct-

ed nearly all the roads within their respective limits, and still keep them under their control. This latter fact alone is perhaps sufficient to account for the want of energy, mismanagement and want of speed in movement. Exceptions upon one or two of the Prussian lines, and those of Belgium, which have caught a little life from connection of the French roads, the trains move at a snail's pace, hardly averaging 10 miles the hour, with four or five times the men employed upon the American lines, twice, and often thrice the time is occupied in getting the trains ready. The employees upon all the roads have a sort of military costume, and in Austria the chief conductor is provided with a bugle, a few blasts from which gives the signal for departure, quite a musical and not unpleasant method.

The whole extent of roads in operation in Germany and dependencies at the commencement of this year was 1,140 German or 5,253 American miles. With few exceptions they have but one track, are laid upon transverse sleepers of oak or pine, have a rather light T rail, and are of the narrow gauge. There are usually three classes of cars—the first and second are similar to those upon all European roads—having three or four compartments in each carriage, between which there is no communication, and in which are two benches running across the carriage, affording seats for eight persons. The seats of the 1st class are cushioned, and the backs well stuffed. The greatest inconvenience is, that as the two rows of seats face each other, one half the passengers must ride backwards. There are no means of warming the cars save that in those of the first class, boxes of hot sand are provided for one's feet. The second class of cars are more comfortable upon the German roads than upon those of any other European country, and the consequence is that nearly all the passengers here take that class. The rates of fare for the 2d class carriages here correspond nearly with the rates upon our roads. Those of the 1st class are of course a little higher, while those of the third are much lower. The difference between the rates for the 1st and 2d class here is much less than upon the French and English roads, and there is less difference between the style and comfort of the 1st and 2d classes of carriages—those of the second class being nearly equal to those of the 1st class.

A great many additional roads have been projected in Germany, and some few are in process of construction. That portion of the line from Vienna to Trieste which is not completed (from Laibach to Trieste) is now in process of construction, and will be opened as soon as possible, say in one and a half or two years, if the government can get funds; which is by no means a sure case. The line from Prague to Dresden is nearly completed. It will be opened in about 4 months, when Mr. Andrews, the enterprising Englishman who first put steamers upon the Danube, and who has now six steamers upon the Elbe, expects to be obliged to quit the latter river altogether, as the road runs upon its banks.—I endeavored to encourage him with the idea that he would be able to compete with the road, and he will certainly make the attempt, with what success remains to be determined. The current of the Elbe here is rather rapid, and the navigation somewhat difficult; but the amount of pleasure travel is now great, and will constantly increase, owing to the surpassing beauty of the scenery through this "Saxon Switzerland" as it is called. The two portions of roads I have mentioned, with one or two more of less extent are the only ones that I see much pro-

bability of being completed for some time to come, owing to the unhappy state of political affairs.

The revolutions which broke out almost simultaneously in the different States, and which for a time drove sovereigns from their royal abodes, and some of them from their thrones, have, by the aid of treachery and Russian bayonets, been apparently quelled. The roar of cannon is no longer heard—royalty has skulked from the castles in which it had taken refuge, and returned to its accustomed haunts, more however like the traveller who expects to pass but a few days, than like the master of his house and people. Though there be peace, there is no quiet, no feeling of security. Almost one-half the people is armed against the other half—Austria has with the new levies 750,000 men under arms; Prussia, 350,000; and the smaller States in proportion. The contests have for the present, however have been transferred from the battle field to the forum. Representatives of the people in almost every State are discussing the forms of constitutions they will accept from their respective sovereigns, and the Congress which was lately in session in this city is to reassemble at Erfurt on the 20th of this month, to agree upon terms of general union and confederation. What the result of this will be, of course no one can foretell; but the wide difference which has thus far manifested itself between what the people demand on the one hand and what the governments seem willing to award on the other, together with the strong sectional feelings and jealousies that have been stirred up, will make any amicable arrangement seem almost a miracle. The present aspect of Germany is therefore far from promising, at the same time it is in one respect singularly anomalous and amusing.

The representatives of the people are contending with great earnestness and pertinacity, for this or that right, to be inserted in the new constitutions, while their old constitutions, with all the rights therein guaranteed by them are entirely suspended, or superseded by martial law, which is now enforced in nearly every State. The civil authorities do not exist, or have no duties to perform. The sovereigns rule the people only as commanders of the military forces. The recent disturbances have been destructive to business and detrimental to industry, at the same time they have augmented enormously the burdens that will be a tax upon the profits of both. We must not be surprised therefore if Germany for the next 5 years does little for the progress of that mighty agency of the present century, the introduction of which into her borders has contributed more than all things else probably to produce the recent agitations with which she has been afflicted, or blessed. Steam has already revolutionized the country, and if the proper applications are contrived and persevered in, quite sure I am it will republicanize not only this country, but the whole world. It will prove the best antidote for despotism that has ever been discovered.

BERLIN, March 12, 1850.

In a former number I set the time required from Boston to Paris as we came at 11½ days. From Paris we go to Tonnere in cars, thence to Dizon in diligence, thence to Chalon in cars, and thence to Lyons in steamer upon the Saone, the whole occupying two days. From Lyons we descend the Rhone, through varied and beautiful scenery to Avignon, and there take the railway again to Marseilles, which we do easily in two days more. One day by steamer takes us to Genoa, calling at Nice

on the way. From Genoa we proceed to Novi over the lower Alps by diligence, and then take the railway to Turin, the capital of Sardinia, doing the whole in part of a day. From Turin to Milan occupies us another day in the diligence, and thence we go to Verona, still via diligence, whence we take the cars for Venice, doing this in another day. From Venice to Trieste in a beautiful steamer we make in 6 hours, and thence to Larbach by diligence, where we take cars for Vienna, and arrive in less than two days from Venice. From Vienna it is an easy day's ride to Prague, and thence to Dresden down the Elbe in another day. From Dresden 6 hours by railway brings us to Berlin, and from Berlin we go in 24 hours to Cologne, and from Cologne in another 24 hours we pass Aix la Chapelle, Brussels and arrive at Paris, making the whole tour from Boston to Vienna and back to Paris, passing through the principal capitals of Europe in less than 27 days. These data will enable a person to estimate pretty accurately the time necessary to visit, as he would like the places mentioned, and make such deviations from the principal route as would be desirable, at the same time they show how wonderfully the steam ship and the locomotive have facilitated travel, rendering it at the same time far less fatiguing.

The German roads have been built at a much lower cost than other European roads are, well nigh down to the average of our own, as will be seen by the subjoined table, showing the cost of some of the lines. The chief saving is in the price of labor, which averages little if any more than 15 cents the day. The workmen upon railways sometimes make 20 cents the day by taking jobs. The timber for cross sleepers and the land damages costs less here than in France and England. Upon the whole the American sees many more opportunities for suggesting improvements here, than for learning them and he cannot fail to be impressed even in passing over the best lines that the Germans are 8 or 10 years behind the times in the construction and management of railroads.

	No. of miles.	Expense. Total.	p. mile.
Budweis, Linz, Germany.....	122	\$1,207,873	\$9,900
Berlin, Stettin.....	83	2,407,039	29,000
Berlin, Anhalt.....	92	3,185,319	33,886
Breslau, Fribourg, Sweidnitz.....	41	1,329,658	32,430
Bonn, Cologne.....	18	617,659	34,314
Rhenan.....	47	6,393,715	136,036
Leipzig, Dresden.....	71	4,310,919	60,717
Madebourg, Leipzig.....	74	3,423,555	46,264
Madebourg, Halberstadt.....	36	1,073,951	29,832
Manheim, Bale.....	140	7,198,200	51,415
Munich, Augsburg.....	38	1,674,065	44,054
Nuremberg, Furth.....	37-10	85,366	23,072
Hanover, Brunswick.....	38	978,390	25,747
Altona, Kiel.....	66	1,434,222	21,730
Hamburg, Bergedorf.....	10	641,861	64,186

ON THE CONSTRUCTION OF SEWERS.

Continued from page 291.

Gratings.—It has been a practice with me to place our sewer gratings about fifty yards asunder; they are made slightly, dished in the middle, and with bars about 4 in. apart, so as effectually to prevent stones and other solid substances getting into the sewer: the bars are also beveled on the under side, so as to prevent the dirt clogging to them.—They measure 16 in. by 13½ in., and are about 2 cwt each, and we connect them with the sewer with 9-in. pipes. The old gratings weighed about 5 cwt., and measured 30 in. by 24 in., with bars 1½ in. to 2 in. asunder. I often found them connected with the sewer by 9 in. drain pipes, of an area of 63 in., while the clear area or space between the bars was about 351 inches. The old traps also were of similar huge dimensions as to area.

I have recently introduced side gratings fitted into the curb stones, which are more efficient, and not so unsightly as the old gratings; these, I find, are recently introduced into Liverpool, and they have for many years been adopted in Birmingham and Paris.

In London, Liverpool, and other towns glazed pipes only are allowed to be used, and in the former places they are now entering into large contracts for supplies of them. Glass pipes are now being manufactured for the purposes of drainage and as water mains; from their straightness and extreme smoothness, they will discharge a greater amount of fluid than glazed pipes, but their high price, which is as follows, is rather an obstacle to their use:

1 inch....	7d. per foot.	2½ inch....	14d. per foot.
1¼ "....	8d " "	2¾ "....	16d. " "
1½ "....	9d " "	3 "....	18d. " "
1¾ "....	10d. " "		20d. " "
2 "....	12d. " "		

The ends of the pipes are now annealed, so they are not so liable to fracture as when first made, and the manufacturers have invented a collar and cement that is used for the purpose of joining them together, and which makes a perfectly water-tight joint.

As the best security against the passage of foul air from sewers and drains, all openings should be trapped, and the most effectual trap I consider yet invented for house drains is the syphon trap of glazed stone ware. I have recently introduced the patent valve trap, the pipe being composed of glazed stone ware, and the valve of galvanized iron, but I have discovered that it is not so effectual as the syphon trap, as you cannot ensure tightness at all times, but they effectually prevent vermin getting up the drains.

Street Cleansing.—The thorough cleansing of the streets of towns has a salutary effect on the health of the inhabitants. Our principal thoroughfares should be swept daily, and the inferior streets twice or thrice a week, and at the same time the streets are swept, the courts should be cleansed likewise. Our principal streets contain 22,202 superficial yards; second class streets, 19,061 yards; and the third class 32,545 yards; making a total of 73,808 yards, which will require the labor of 49 able-bodied men to cleanse daily, and if cleansed as above stated, 18 able-bodied men. There are several methods recommended and adopted for cleansing streets, viz., by means of jets of water, (as adopted at Philadelphia), the patent sweeping machine and by hand labor.

Cost of cleaning by jets of water..	5½d. p. 1000 yd.
Patent machine.....	10½d. " "
(Experiments at Salford).....	8½d. " "
Hand labor [able bodied].....	15d. " "
Pauper hand labor.....	24d. " "

The following is the result of experiments tried by Mr. Chadwick, member of the Board of Health in Pall-Mall, London, to ascertain the relative cost of the two systems of hand labor:

The price of sweeping Pall-Mall was by pauper labor.....	3s. 10d.
The price of sweeping Pall-Mall was by free labor.....	2s. 6d.

The paupers were paid 3s. 10d. a-day, the free laborers 2s. 6d.

The system of pauper labor has had a fair and impartial trial on the turnpike roads throughout the kingdom; and if the opinions of such men as Telford and Macadam are worth anything, it has been justly condemned, and generally abandoned on the score of inefficiency and costliness.

Street Surfaces.—The best material for the surface of streets has been a subject of much controversy.

Macadam's system of making and repairing street surfaces with stones broken small, resting upon the subsoil, is erroneous in principle. Telford's, with a solid foundation of sand or other stones set or pitched by hand, and covered with a coating of durable granite, whin, or quartz rock, is much to be preferred; in fact I consider the roadway of streets formed with small broken stones totally inapplicable for towns, as being expensive, unhealthy for the inhabitants, and also as the means of adding very considerably to the labor of horses in draught.

The round or boulder stone pavement is also open to objection, as it allows the liquid filth to perforate through the large open fissures into the subsoil with which it becomes saturated, and in certain states of the weather, gives off offensive exhalations; and as generally constructed, without a proper foundation, the stones being irregular in size, yield, in different proportions to the weight passing over them according to the superficial area of the bearing surface of the stones, which forms ruts and hollows, and disagreeable inequalities in the streets.

But a good pavement may be formed of the round pebbles, provided a foundation of concrete or other solid material is previously prepared, and the stones carefully sorted, so as to have them of one uniform size.

As the best and most economical mode of preparing the roadway of streets, I would recommend the square set pavement, composed of granite, whin, or other equally durable stone, in blocks carefully squared, 6 to 7 inches deep, 2½ to 3 inches thick, and not exceeding 1 foot in length, to be set in the streets in regular transverse courses, about 1½ inch assunder, so as to afford a good foothold for the horses, and the lower part of the cavity between the stones filled up with good sharp gravel, and the upper part mixed with a little asphalt, so as to prevent moisture from penetrating through.

The foundation I would have prepared with concrete 12 to 18 inches thick, according to the amount of the traffic of the street; it may be formed of gravel, broken stone, or burnt clay, as may be found the most economical, mixed with a proportion of hydraulic lime and sand, and this throws upon the prepared surface of the street from an altitude and afterwards shaped to the requisite curvature, and of one uniform thickness, will make a sound and durable bed for the sets.

The curvature of a street should form a segment of a circle, with a versed sine of not more than is required just to throw off the surface water. The great error in the form of our streets is the extreme roundness that is given to the cross section. I consider that a versed sine of nine inches in a street 30 feet wide, ample.—*C.E. & A. Jour.*

REPORT OF THE COMMISSIONERS APPOINTED TO INQUIRE INTO THE APPLICATION OF IRON TO RAILWAY STRUCTURES.*

From the information supplied to us, it appears that the proportions and forms at present employed for iron structures, have been generally derived from numerous and careful experiments, made by subjecting bars of wrought or cast iron, of different forms, to the action of weights, and thence determining by theory and calculation such principles and rules as would enable these results to be extended and applied to such larger structures and loads as are required in practice. But the experiments were made by dead pressure, and therefore only apply therefore to the action of weights at rest. On the contrary, from the nature of the railway system, the structures employed therein are necessarily exposed to concussions, vibrations, torsions, and momentary pressures of enormous magnitude, produced by the rapid and repeated passage of heavy trains.

These disturbing causes, in smaller degree, have always occurred in structures connected with mill-work or other mechanism. But the effects upon their stability have not been found greater than could be met by increasing the dimensions of the parts without especially inquiring into the exact principles upon which such increase should be made. Thus, we are informed that the dimensions of cast iron girders, intended for sustaining stationary loads, such as water-tanks and floors, are usually so proportioned that their breaking weight shall be three times as great as the load they are to carry, or in some cases four or five times as great. But when the girders are intended for railway bridges, and therefore subject to much concussion and vibration, greater strength is given to them by altering the above proportions, and making the breaking weight from six to ten times as great as the load, according to the practice of different engineers. On the other hand, some consider that one third of the breaking weight is as safe a load in the latter case as in the former.

* From the London Civil Engineer and Architect's Journal, for February, 1850.

As it soon appeared, in the course of our inquiry, that the effects of heavy bodies moving with great velocity upon structures had never been made the subject of direct scientific investigation and as it also appeared that, in the opinion of practical and scientific engineers, such an inquiry was highly desirable, our attention was early directed to the devising of some experiments for the purpose of elucidating this matter.

The questions to be examined may be arranged under two heads, viz:

1. Whether the substance of metal which has been exposed for a long period to percussions and vibrations undergoes any change in the arrangement of its particles, by which it becomes weakened?
2. What are the mechanical effects of percussions, and of the passage of heavy bodies in deflecting and fracturing the bars and beams upon which they are made to act?

A great difference of opinion exists among practical men with respect to the first of these questions. Many curious facts have been elicited by us in evidence, which show that pieces of wrought iron which have been exposed to vibration, such as the axles of railway carriages, the chains of cranes, etc., employed in raising heavy weights, frequently break after long use, and exhibit a peculiar crystalline fracture and loss of tenacity, which is considered by some engineers to be the result of a gradual change produced in the internal structure of the metal by the vibrations. In confirmation of this, various facts are adduced, as, for instance, that if a piece of good fibrous iron have the thread of a screw cut upon one end of it by the usual process of tapping, which is always accompanied by much vibratory action, and if the bar be then broken across, it will be found that the tapped part is a good deal more crystalline than the other portion of the bar. Others contend that this peculiar structure is the result of an original fault in the process of manufacture, and deny this effect of vibration altogether, whilst some allege that the crystalline structure can be imparted to fibrous iron in various ways, as by repeatedly heating a bar red hot, and plunging it into cold water, or by continually hammering it, when cold, for half an hour or more.

Mr. Brunel, however, thinks the various appearances of the fracture depend much upon the mode in which the iron is broken. The same piece of iron may be made to exhibit a fibrous fracture when broken by a slow heavy blow, and a crystalline fracture when broken by a sharp short blow. Temperature alone has also a decided effect upon the fracture; iron broken in a cold state shows a more crystalline fracture than the same iron warmed a little.

The same effects are by some supposed to be extended to cast iron.

We have endeavored to examine this question experimentally in various ways.

A bar of cast iron, 3 inches square, was placed on supports about 14 feet assunder. A heavy ball was suspended by a wire 16 feet long, from the roof, so as to touch the centre of the side of the bar. By drawing this ball out of the vertical position at right angles to the length of the bar, in the manner of a pendulum, to any required distance, and suddenly releasing it, it could be made to strike a horizontal blow upon the bar, the magnitude of which could be adjusted at pleasure, either by varying the size of the ball or the distance from which it was released. Various bars (some of smaller size than the above) were subjected by means of this apparatus to successions of blows, numbering in most cases as many as 4000, the magnitude of the blow in each set of experiments being made greater or smaller as occasion required. The general result obtained was, that when the blow was powerful enough to bend the bars through one-half of their ultimate deflection, (that is to say, the deflection which corresponds to their fracture by dead pressure,) no bar was able to stand 4000 of such blows in succession; but all the bars, when sound, resisted the effects of 4000 blows, each bending them through one-third of their ultimate deflection.

Other cast iron bars, of similar dimensions, were subjected to the action of a revolving cam, driven by a steam engine. By this they were quietly depressed in the centre, and allowed to restore themselves, the process being continued to the extent even, in some cases, of 100,000 successive periodic

depressions for each bar at a rate of about four per minute. Another contrivance was tried, by which the whole bar was also, during the depression, thrown into a violent tremor. The results of these experiments were, that when the depression was equal to one-third of the ultimate deflexion, the bars were not weakened. This was ascertained by breaking them in the usual manner with stationary loads in the centre. When, however, the depressions produced by the machine were made equal to one-half of the ultimate deflexion, the bars were actually broken by less than 900 depressions. This result corresponds with and confirms the former.

By other machinery, a weight equal to one-half of the breaking weight was slowly and continually dragged backwards and forwards from one end to the other of a bar of similar dimensions to the above. A sound bar was not apparently weakened by 96,000 transits of the weight.

It may, on the whole, therefore be said that, as far as the effects of reiterated flexure are concerned, cast iron beams should be so proportioned as scarcely to suffer a deflexion of one-third of their ultimate deflexion. And as it will presently appear that the deflexion produced by a given load, if laid on the beam at rest, is liable to be considerably increased by the effect of percussion, as well as by motion imparted to the load, it follows, that to allow the greatest load to be one-sixth of the breaking weight is hardly a sufficient limit for safety, even upon the supposition that the beam is perfectly sound.

In wrought iron bars no very perceptible effect was produced by 10,000 successive deflexions by means of a revolving cam, each deflexion being due to half the weight which, when applied statically, produced a large permanent flexure.

Under the second head, namely, the inquiry into the mechanical effects of percussions and moving weights, a great number of experiments have been made to illustrate the impact of heavy bodies on beams. From these it appears that bars of cast iron of the same length and weight, struck horizontally by the same ball, (by means of the apparatus above described for long continued impact,) offer the same resistance to impact whatever be the form of their transverse section, provided the sectional area be the same. Thus a bar, $6 \times 1\frac{1}{2}$ inches in section, placed on supports about 14 feet assunder, required the same magnitude of blow to break it in the middle, whether it was struck on the broad side or the narrow one, and similar blows were required to break a bar of the same length, the section of which was a square of 3 inches, and therefore of the same sectional area and weight as the first.

Another course of experiments tried with the same apparatus showed, amongst other results, that the deflexions of wrought iron bars produced by the striking ball were nearly as the velocity of impact. The deflexions in cast iron are greater than in proportion to the velocity.

A set of experiments was undertaken to obtain the effects of additional loads spread uniformly over a beam, increasing its power of bearing impacts from the same ball falling perpendicularly upon it. It was found that beams of cast iron, loaded to a certain degree with weights spread over their whole length, and so attached to them as not to prevent the flexure of the bar, resisted greater impacts from the same body falling on them than when the beams were unloaded, in the ratio of two to one. The bars in this case were struck in the middle by the same ball falling vertically, through different heights, and the deflexions were nearly as the velocity of impact.

We have also carried on a series of experiments to compare the mechanical effect produced by weights passing with more or less velocity over bridges, with their effect when placed at rest upon them. For this purpose, amongst other methods, an apparatus was constructed, by means of which a car, loaded at pleasure with various weights, was allowed to run down an inclined plane: the iron bars which were the subject of the experiment were fixed horizontally at the bottom of the plane, in such a manner that the loaded car would pass over them with the velocity acquired in its descent. Thus the effects of giving different velocities to the loaded car, in depressing or fracturing the bars, could be observed and compared with the effects of the same loads placed at rest upon the bar.

This apparatus was on a sufficiently large scale to give a practical value to the results; the upper end of the inclined plane was nearly 40 feet above the horizontal portion, and a pair of rails, 3 feet assunder, were laid along its whole length for the guidance of the car, which was capable of being loaded to about 2 tons; the trial bars, 9 feet in length, were laid in continuation of this railway at the horizontal part, and the inclined and horizontal portions of the railway were connected by a gentle curve. Contrivances were adapted to the trial bars, by means of which the deflexions produced by the passage of the loaded car were registered; the velocity given to the car was also measured, but that velocity was, of course, limited by the height of the plane, and the greatest that could be obtained was 43 feet per second, or about 30 miles per hour.

A great number of experiments were tried with this apparatus, for the purpose of comparing the effects of different loads and velocities upon bars of various dimensions, and the general result obtained was, that the deflexion produced by a load passing along the bar was greater than that which was produced by placing the same load at rest upon the middle of the bar, and that this deflexion was increased when the velocity was increased. Thus, for example, when the carriage, loaded to 1120 lbs. was placed at rest upon a pair of cast iron bars, 9 feet long, 4 inches broad, and $1\frac{1}{2}$ inches deep, it produced a deflection of 6-10ths of an inch; but when the carriage was caused to pass over the bars at the rate of 10 miles an hour, the deflexion was increased to 8-10ths, and went on increasing as the velocity was increased, so that at 30 miles per hour, the deflexion became $1\frac{1}{2}$ inch; that is, more than double the statical deflexion.

Since the velocity so greatly increases the effect of a given load in deflecting the bars, it follows that a much less load will break the bar when it passes over it than when it is placed at rest upon it, and, accordingly, in the example above selected, a weight of 4150 lbs. is required to break the bars if applied at rest upon their centres; but a weight of 1778 lbs. is sufficient to produce fracture if passed over them at the rate of 30 miles an hour.

To be continued.

MANUFACTURING IN INDIANA.

Cannelton Cotton Mill.—It has been shown that Cannelton has superior natural advantages for a manufacturing city to any other of which we now have any knowledge. To develop these advantages, we only require the aid of men of character, intelligence and capital. To show that such men are already enlisted with us, we subjoin a list of the stockholders of the Cannelton cotton mill.

William Richardson, Dr. Chas. W. Short, Hamilton Smith, Lewis Ruffner, Perley Chamberlin, Wm. F. Pettet, Alfred Thruston, Robinson, Peter & Carey, Robinson & Brothers, Joseph S. Morris, Edwin Morris, Thomas C. Coleman, Jas. C. Ford, E. Hutchings, Col. Thomas Anderson, Robert G. Courtney, James E. Breed, Col. Stephen H. Long, T. G. Richardson, Jacob Beckwith, Samuel L. Nock, John L. Martin, Thomas E. Wilson, Willis Ranney, Wm. A. Richardson and Chas. H. Lewis, of Louisville, Ky.; Jas. Boyd, Hon. E. M. Huntington and J. B. Smith, of Cannelton, Ind.; Col. Wm. McLane, of Bedford, Ind.; Hon. Robert D. Owen and Dr. David D. Owen, of New Harmony, Ind.; Randal Crawford, New Albany, Ind.; Hon. O. J. Morgan, Carroll Parish, La.; Hon. Henry Bry, Monroe, La.; Dr. M. J. Sellers, Lake Providence, La.; Hon. Maunsel White, and F. Y. Carlie, New Orleans, La.; Rt. Rev. L. Polk, Philadelphia, Pa.; Col. Wm. L. Campbell and Hon. F. Griffin, Greenville, Miss.; David Hunt, Rodney, Miss.; John Hutchins and R. M. Gaines, Natchez, Miss.; Charles T. James, Providence, R. I.

The above list is unquestionably the strongest of its kind ever got up in the Mississippi valley.—There is not on it the name of a speculator. Every name on it is that of a man of substance, who has money to invest every year. Most of these names represent men of fortune, who have made their estates by habitual thrift. They have not taken hold of this thing to make a fancy stock, but to make a permanent investment. If this mill meets their expectations, they are able and will be ready to build another. Indeed, we have no question but that they are able to build and put in operation such a

mill as this out of their annual surplus income, and we know that Messrs. Ford, Martin, Hunt, Bry, Morgan, Campbell, Griffin, Hutchins and Gaines, could furnish a full supply of cotton to this mill out of their surplus crop. The officers of the company who receive no emolument from their offices, own about \$100,000 of the stock. The contractor for the machinery has not only invested over \$30,000 in and about the mill, but has invested therein his reputation as a manufacturer and mill builder.—He has pledged himself to make this mill the best, i.e., the most productive, of the kind in the world, and has stated that Cannelton is the best position now known for the establishment and operation of a cotton mill.

Of these Stockholders, one is Col. S. H. Long, the distinguished head of the U. S. Topographical Bureau in the West, who is justly regarded as the ablest and most experienced civil engineer in America. Another is Hon. R. Dale Owen, who was once a cotton manufacturer in Scotland, and whose extended observation in all the important manufacturing districts of the world fully qualifies him to judge of our advantages. Another is Dr. D. Dale Owen, whose geological information, practical and scientific, is unsurpassed. To these high authorities we refer for the truth of our statements as to the superior advantages of our position.

The Louisville stockholders are among the most prominent and successful business men of that city, and are familiar with every department of western finance, trade and commerce.

In short, these stockholders are men who do not engage in any enterprise without due consideration, and who are sure to accomplish whatever they undertake. They are not men to be discouraged by petty obstacles, and cannot be diverted from their well considered purposes by the doubts of ignorance or the opposition of other interests. There is a certainty that they will make all that can be made out of their advantages and operations here.—*Cannelton Economist*.

IMPORTS OF CORN AND OTHER GRAIN INTO GREAT BRITAIN IN 1849.

According to a return published, the total quantity of wheat and wheat flour imported into the United Kingdom in the year ending January 5, 1850, amounted to 4,825,280 quarters, of which 4,765,233 were from foreign countries, and 160,047 from British colonies; the average price of wheat during the year being 44s. 3d. The quantity of foreign barley and barley meal imported in the same year was 1,389,858 quarters, the average price being 27s. 9d. The total quantity of oats and oatmeal imported was 1,307,904 quarters, of which 1,283,834 were foreign, and 24,070 British colonial—the average price was 17s. 6d. Of rye meal 246,843 quarters were imported; 246,832 from foreign countries, and 21 from British colonies; the average price being 25s. 8d. The quantity of peas and peameal imported was 236,525 quarters, of which 221,705 was foreign, and 14,820 British colonial; the average price being 31s. 2d. The total imports of beans and beanmeal amounted to 458,651, all of which, with the exception of one quarter, was foreign; the average price being 30s. 2d. The quantity of Indian corn and meal imported was 2,277,224 quarters, 2,274,634 being foreign, and 2,600 British colonial. The imports of buckwheat and buckwheatmeal amounted to 627 quarters, all but one quarter being foreign. In bere or bigg 943 quarters were imported. The aggregate quantity of grain and meal of all sorts imported in 1849, amounted to 10,753,755 quarters, the largest proportions being supplied by Denmark, 1,320,571; Prussia, 1,364,694; Russia, northern ports, 343,124, ports within the Black sea, 577,633; France, 1,025,009; and the United States of America, 1,834,000.

ENGLISH NAVY.

The present number of British seamen is about 270,000, of whom 200,000 belong to the mercantile marine, and 25,000 to the navy, the remainder being in foreign service. The total number of vessels belonging to the merchant service of the British empire was, in 1848, no less than 33,672, having an aggregate tonnage of 4,052,160, and carrying collectively 230,069 men. The average rate of increase in the merchant vessels for the last ten years has been 600 per annum, while the annual

increase of burden amounts, within a fraction, to 100,000 tons. By this means employment is found for 5000 fresh hands every year. The British empire possesses one third more vessels than France; while the aggregate tonnage of the British ships is upwards of four times as great as the French, and one third more than the collective burden of the American vessels. An idea of the extent of the foreign trade carried on by this country may be formed from the number of British and foreign vessels that annually enter the several ports of the United Kingdom. Those in 1848 amounted to 35,000 vessels, 13,000 of which were foreign, having a gross burden of 64 million tons, and giving employment to nearly 350,000 men. The total value of the exports and imports effected by such means amounts to upwards of 75 millions per annum. According to the estimate of Mr. G. F. Young, the ships engaged in the mercantile marine are worth £38,000,000. The sum annually expended in building, repairing, and outfitting new and old ships amounts to £10,500,000—and the cost of the wages and provisions for the seamen engaged in navigating the merchant vessels to £9,500,000; while the amount annually received for freight by the ship owners is said to come to £29,500,000.—The foreign trade, in connection with the port of London, is very nearly one fourth of the entire maritime commerce of the United Kingdom. The number of vessels that entered the port of London in 1847 was upwards of 9000, and the gross tonnage nearly 2,000,000; the rate of increase being about half a million tons and 2,500 vessels in five years, or 100,000 tons and 500 vessels per annum.

Progress of Oswego.

Oswego seems to be gaining rapidly upon Buffalo as a point of transshipment of western produce. The following tables will show the number of tons transhipped at each port, with the increase of the same, since 1840:

	Buffalo & Bl'k Rock.	Oswego.
	Tons.	Tons.
1840.....	138,101	20,047
1841.....	194,750	29,426
1842.....	190,967	30,510
1843.....	231,236	35,140
1844.....	240,548	67,477
1845.....	233,135	71,416
1846.....	396,512	110,318
1847.....	659,966	152,874
1848.....	492,280	157,874
1849.....	535,086	233,583

The business of this State is not included in the above statement, and if added would increase the figures at each place only about ten per cent.

The following statement shows the value of all property shipped, whether from this State or Western States and corroborates the foregoing:

	Buffalo & Bl'k Rock.	Oswego.
1840.....	\$6,200,289	\$1,677,069
1841.....	9,706,924	2,182,349
1842.....	7,541,793	1,674,015
1843.....	9,732,616	2,205,327
1844.....	8,188,339	3,314,412
1845.....	9,510,155	3,810,490
1846.....	15,819,314	4,652,665
1847.....	28,503,745	7,440,131
1848.....	17,917,538	7,099,076
1849.....	20,647,562	8,926,194

A general knowledge of the character of the business may be had from the values of last year.

	Buffalo and Bl'k Rock.	Oswego.
The forest.....	\$2,699,222	\$977,387
Product of animals.....	5,516,269	1,809,349
Vegetable food.....	10,442,407	5,327,367
Other agricultural products.....	370,696	35,263
Manufactures.....	512,318	290,621
Merchandise.....	126,177	27,054
Other articles.....	980,473	459,153
	\$20,647,562	\$8,926,194

This shows a total shipment at the two places of \$29,573,866, and exceeds the highest value, in any one year, of property delivered at tide water, from all the canals, prior to 1844. The largest year was 1843, when it was \$28,453,408.

At the present rate of increase in the trade of Oswego, with the advantage she has over Buffalo, of an additional lake, (Ontario,) and with reciprocal trade with Canada, limits can hardly be set to the rapidity and extent of her progress.

Tonnage of San Francisco.

We are indebted to the Hon. Wm. D. Fair, of the California Senate, for the subjoined statement made by the Harbor Master of San Francisco:

Statement of the amount of tonnage, American and foreign, also the number of passengers, both American and foreign, that have arrived in the port of San Francisco from the 13th of April, 1849, to 28th February, 1850, both inclusive:

American tonnage.....	247,417
Foreign do	65,934
Total.....	313,351
Number of vessels, exclusive of those for government:	
American	555
Foreign	356
Total.....	911
Number of passengers that have arrived in same:	
Female.....	
American	930
Foreign	628
Total.....	1,558
Male.....	
American	30,574
Foreign	9,507
Total.....	40,081
Number of officers and seamen that have left their vessels, from various causes.....	14,240

Total number of persons arrived in the above vessels..... 55,949

Amount of tonnage and passengers arrived from January 29th to February 28th, 1850, inclusive:

American.....	19,146
Foreign.....	9,556
Total.....	28,702
Passengers:	
Female.....	
American	21
Foreign	126
Total.....	147
Male.....	
American	1,149
Foreign	887
Total.....	2,036

Ed. A. KING, Harbor Master.
Harbor Master's Office, San Francisco,
March 1, 1850.

IRON MANUFACTURE IN MARYLAND.

We copy the following from the Baltimore American relative to the condition of the iron business of that State:—

We have six rolling mills for bars and rails in this State, and they are all stopped but one, and that one is not fully employed.

The furnaces in our state which have stopped, and to which others will be added as soon as the stock on hand is worked up, are as follows, viz:—

- Two at "Mount Savage."
- The "Lena."
- " "Vulcan."
- " "Catoctin."
- " "Sykesville."
- " "Muirkirk."
- Two at "Patuxent."
- The "Elkridge."
- " "Maryland."
- " "Locust Point."
- " "Chesapeake."
- " "Curtis Creek."
- " "Oregon."
- One of the "Ashland."

Indiana.

New Albany and Salem Railroad.—The superstructure for the first 13 miles out from this city is ready for the iron, and by the time this part of the track is fully completed and made ready for the cars the superstructure will be finished to Providence. That portion of the road forfeited by the original contractors, lying between Providence and Salem, has been re-let, and is to be finished for the cars by the 1st of July. Beyond Salem, on to Saltillo, they are progressing rapidly with the work, with the intention of completing it to the latter

place by December, which will give us about 46 miles of the road the coming winter.—*New Albany Bulletin.*

The Legislature of Pennsylvania has passed a general banking act, regulating the banks of that State that shall hereafter be chartered and re-chartered. By this law the liability principle is extended to all issues of banks; all foreign notes, or the notes of other States under the denomination of ten dollars, are excluded from circulation in that commonwealth; the directors are made personally liable for the deposits and other debts, in case of the fraudulent insolvency of banks; cashiers are required to give bonds to the amount of one-fifth of the capital, when it is \$200,000 and under; in one-eighth when it is between \$200,000 and \$500,000, and in one tenth where it is over \$500,000, and not exceeding \$1,000,000. The extent of the term for which each bank shall be chartered is fifteen years. Banks can be chartered for a less period, but none for a greater, in the aggregate.

DEPTHS OF THE EUROPEAN AND OPEN SEAS.

In the neighborhood of the continents the seas are often shallow: thus the Baltic sea has a depth of only 120 feet between the coasts of Germany and those of Sweden. The Adriatic, between Venice and Trieste, has a depth of only 130 feet. Between France and England the greatest depth does not exceed 300 feet, while southwest of Ireland it suddenly sinks to 2000 feet. The seas in the south of Europe are much deeper than the preceding. The western basin of the Mediterranean seems to be deep. In the narrowest parts of the straits of Gibraltar it is not more than 1000 feet below the surface. A little further towards the east the depth falls to 3000 feet, and at the south of the coast of Spain to nearly 6000 feet. On the northwest of Sardinia, bottom has not been found at a depth of nearly 5000 feet. With respect to the open seas, their depths are little known. About 250 miles south of Nantucket the lead has been sunk to 7800 feet. In north latitude, at 76°, Captain Ross has exceeded 6000 in Baffin's bay. But the most astonishing depths are found in the southern Atlantic; West of the Cape of Good Hope, 16,000 feet have been found, and the plummet has not found bottom at 27,600 feet west of St. Helena. Dr. Young, relying upon the theory of the tides, considered himself justified in assigning about 15,000 feet to the Atlantic, and about 20,000 to the Pacific.

CONSOLIDATION OF THE AUBURN AND ROCHESTER, AND AUBURN AND SYRACUSE RAILROAD COMPANIES.

We are much gratified to learn that at the adjourned meeting of the committee of shareholders of the Auburn and Rochester and Auburn and Syracuse railroad companies, held at Boston on the 9th inst., the terms of consolidation of all the stock, property, and effects of these two companies, was finally agreed upon, to take effect on the first day of August next, after which date, the consolidated company is to bear the name of the *Rochester and Syracuse Railroad Co.*

The aggregate capital of the two companies will amount to about \$4,200,000, and the extent of road embraced is 94 miles.

The basis of the amalgamation we understand to be essentially that proposed by Henry B. Gibson, Esq., President of the Auburn and Rochester road, the terms of which are considered just and equitable to all parties concerned.

This movement is one which cannot fail to prove beneficial to the interests of the stockholders of these two companies, and will at the same time accord equally with the interests and wishes of the travelling public. Many vexatious inconveniences have heretofore been encountered by reason of the number of companies comprising the line be-

tween this and Buffalo. And we are gratified to know that further improvements of this character are in progress, and likely to be consummated, by an amalgamation of the Attica and Buffalo and Tonawanda companies.

It is understood in connection with this subject that as soon as the process of consolidation is complete in all its details, a meeting of the stockholders will be called to decide upon the construction of a branch of the consolidated company, to be built as nearly as possible in a straight line between the cities of Rochester and Syracuse, which, we are informed when completed, will shorten the distance between Albany and Buffalo by this line, nearly 20 miles.—*Alb. Jour.*

Ohio.

Hamilton Railroad.—In answer to inquiries made, we take great pleasure in saying that the President and directors of the Cincinnati, Hamilton, and Dayton Railroad, have fully succeeded in compromising all difficulties between this city and Hamilton, except a few so trifling in their character as to be the objects of no particular concern.

We take further pleasure in stating, that on every half mile of railroad, between the two points named, laborers are now engaged, who are tasking their best energies to push the work forward with expedition. Difficulties being removed, the stock taken, and money ready at call, there is nothing on this section of the work to prevent energetic movements, and we doubt not that everything will proceed with rapidity to the completion of the work.—*Cin. Gaz.*

North Carolina.

Progress of the Manchester Road.—The Wilmington Commercial of Tuesday says: "We learn that there has been \$50,000 worth of work done on the Wilmington and Manchester railroad west of the Pee Dee river, and that \$25,000 worth has been done on the eastern end of the road; and that there are upwards of two hundred men now working on the road, and on the first of August it is expected that 400 will be engaged on the work. Preliminary steps have been taken to buy iron for the western end, and in all probability, contracts will be made at the same time for the other part of the road. Negotiations have been opened with a northern company to complete all the unfinished work of the road.

"These are cheering facts, and shows that there is no cause to apprehend any danger as to the fate of this enterprise. It will not only be done, but will be put in operation quite as early as the most sanguine of our people expected."

Pennsylvania.

Lebanon Valley Railway.—This road is to connect Harrisburg and Reading. The length will be about 48 miles; and the Lebanon valley offers every facility for a cheap railway. We expect to derive some advantages from it. It will attract a respectable share of the produce of the great Central railway, and thus afford us cheaper food, via Reading railroad. But, more than this, it will give a new and profitable source of revenue to our railroad and thus enable it to reduce the heavy freight charge on coal, a burden which our staple cannot bear. In this respect we cannot estimate too highly the revival of the charter of the Lebanon valley road, which was originally granted in 1836. To the Reading railroad company we estimate the value of the new road, when made, at not less than five millions of dollars. Certainly it will yield a revenue interest on that sum: for we feel confident

that the great passenger travel for the west will prefer the Schuylkill and Lebanon valley route to the Central road, and no inconsiderable proportion of the up merchandise will find its way through the same channel.—*Mining Register.*

Illinois.

Alton and Sangamon Railroad.—In our paper of the 9th March last, we gave an account of the organization of this road. The distance from Alton to Springfield, its present northern terminus, is 73 miles; but it is in contemplation to extend it to La Salle, the southern terminus of the Illinois Canal.

The capital of the company is \$1,000,000, half (\$500,000) of which has been subscribed.

The road is located for about twenty miles, and the surveys on the remaining part are being pushed ahead rapidly.

The first division to Carlinville, 33 miles, will be let in a few weeks, and prosecuted vigorously to a completion.

About 10 miles, graded by the State about ten years since, is ready for the rails.

Correspondence of the Journal.

Buffalo, N. Y., May 6, 1850.

H. V. POON, Esq.,

Dear Sir:—When I left you last Friday in New York, I had no idea I should be in this city as late as to-day; nor would this have been so, had I taken the Erie railroad, which business in Albany alone prevented my doing. This road I find now connects with the line of the Albany and Buffalo road at Geneva, to which place passengers are brought by steamboat from the head of Seneca lake. By this arrangement some time and expense are saved over that of the route by Albany—in our case enough to have made it an object to have returned from Albany to Piermont, and there taken the Erie railroad; but no one could have anticipated the delays and impositions that we experienced upon this northern line of roads, and which, for all that we know, may be continued on other unfortunate travellers.

The Albany and Buffalo roads advertise the time of leaving of five different trains each day—in some papers excepting Sundays, in the Syracuse Star making no exceptions. No time of arrival at their destinations is given. The "Express train" of the morning, however, is said to go through in fourteen hours; and the ticket master at Albany stated to me that the evening train went through in about the same time; indeed he called it an Express train, and spoke of its being so expeditious, that I inquired if we paid an extra price in it over the other trains. We purchased our tickets at \$9 75 each, and left Saturday evening at 7 o'clock, after positive assurance to myself and several other passengers, that we should certainly be in Buffalo Sunday morning. At half past eleven we reached Utica, and were informed we must wait two hours and a half. Sat in the cars till 2 A. M., and then proceeded to Syracuse; arrived at 5, and stopped. No notice was given that we were to be detained here, but we were left to find out for ourselves that we should remain in Syracuse till half past five in the afternoon. No officer of the road nor conductor made his appearance, or was found at the depot during the day. I inquired of one of the hands, who was the superintendent, and was very gruffly told he did not know. Of course the passengers were not a little disturbed. One gentleman, whose name I send you, had come on with his sister from New York, to attend the funeral of a brother near Canandaigua. It was to be on Sunday, and it was now

impossible to reach the place in time. He had been very particular in his enquiries of the ticket master at Albany, and was fully assured by him there would be no detention, and by the conductor at Utica there would be none, unless the cars were stopped at Rochester.

We found at Syracuse we were not the only sufferers by this mismanagement on the roads. A train with many passengers from the west arrived there at midnight, a few hours before us. The passengers, I found by conversing with several of them, had been told, some by the ticket master at Rochester, some at Canandaigua and Geneva, and by the conductors east of Geneva, that they should certainly reach Albany Sunday morning. At Syracuse they found they must wait till after nine o'clock Sunday evening. Like ourselves, they were obliged to be two nights on the road, and spend a rainy disagreeable Sunday in Syracuse.

Leaving Syracuse in the evening, we reached Rochester at twelve o'clock, and here to our dismay we were told we must again wait till six in the morning. At six this morning we again entered the cars, and were at last fairly put down in Buffalo at half past nine—thirty eight and a half hours after leaving Albany!

We have been subjected to this treatment with such coolness and indifference on the part of the officers of the road—not a word of explanation or apology having been offered, and passengers by both trains having been alike deceived by false representations—the freight trains also, as we learn by forwarding merchants here, being at least four days behind—it appears that there is something going wrong in the management of the roads, which should demand immediate correction. Collisions and serious accidents upon roads are not often to be ascribed to the officers who direct the affairs of the road; blame is frequently, however, attached to them for these, and the company suffers by the payment of damages. But in these instances of great annoyance as well as of expense and loss to individuals, the managers can very rarely be reached by the sufferers. A road liable to such irregularities must in time become unpopular, and the travel be turned to other parallel routes under better arrangements. These parallel routes are in fact the only security to the travelling public; and the only satisfaction to us in our troubles is, that the Erie road must act as a wholesome check upon this line of roads, and when passengers find themselves badly treated upon one, they can return, as we propose to do, upon the other. G. B. C.

SAFETY STEAM ENGINE.

A Virginia paper states that Mr. Tippet, after great labor and discouragement, "has produced a beautiful one horse power model, the working of which more than justifies the hopes of the most sanguine." "It dispenses entirely with boilers.—The steam is raised by means of a small jet of cold water injected upon a large plug of iron fixed in the furnace, and of sufficient bulk to retain the heat that might be dissipated; by a very simple but perfect contrivance, this steam enters the cylinders, and moves the piston in a manner similar to a common engine. The amount of power is limited only by the strength of the materials. It is infinitely less complex than the common engine, and it is believed that for a given amount of power it can be more economically worked; but the great beauty is its immunity from accidents. It is utterly impossible for any explosion of any extent to occur, for the simple reason that there is nothing in it larger than a cylinder to explode."

A patent right has been taken out for the invention, and it is said that "an effort is to be made this summer to construct a boat and fit her up with one of the engines as an experiment."

We wish success to the invention, but are not machinists enough to express an opinion as to the practicability of bringing this cold water steam engine into general use.—*Baltimore Clipper.*

AMERICAN RAILROAD JOURNAL.

Saturday, May 18, 1850.

Illinois Central & Mobile and Ohio Rail Roads.

Grants of Land for Railroad Construction.

We are glad to learn that the bill, granting a portion of the public lands in the States through which the proposed roads are to run in aid of the above works, has passed the Senate, and that it has a good prospect of passing the House.

Any public work that has a tendency to promote a similarity of pursuits and interests, consequently a similarity of ideas which form the basis of all social harmony, is a public benefit, and its encouragement is warranted by this reason alone. The differences of opinion which now threaten the peace of the country, are founded entirely in the difference in the pursuits between the two extremes of the Union. The North is largely interested in manufacturing and in commerce, while the South is almost exclusively engaged in agriculture. The interests of the two have, mistakenly so we think, been believed to be adverse. Now a railroad, wherever it goes, changes the whole aspect of a community. It gives a new stimulus to industry, because it makes available whatever can serve our wants, or be made a subject of merchandise. It exerts the same influence in the North, South and West. Wherever it runs by a coal field, a bed of iron ore, or a waterfall, it at once sets people to turning these raw materials and this waste power to account. People feel that it is not right that these resources should lie idle, when by using them they can add so much to their comforts, and the means of satisfying their wants. The railroad is the pioneer, and the various arts of life follow close upon its progress. Spread railroads over the whole country, and at the same time you diffuse the same pursuits, and create similar interests over the whole of it, and you ensure a harmony of action in the measures adopted for the material good of the community. Railroads connecting every part of the country bring often together those occupying its extreme portions, and thus a similarity of tastes and ideas are the result. People by seeing, learn to understand each other; the same modes of thinking, similar habits and pursuits, are secured to the whole Union; the same good feeling and mutual confidence which unites into one body the people of a village or a town. Railroads therefore are the most powerful bond of union that modern society possesses. It is a new agent for the concentration of political organizations, not taken into account in the formation of the constitution, yet vastly more powerful than any which then existed.

The roads alluded to will form a direct communication from Lake Michigan to the Gulf of Mexico: thus bringing the extremes of the Union into familiar intercourse with each other, by a more direct and expeditious route than any other that can be constructed.

These views will, we think, as a general thing, be admitted to be correct; but we are so accustomed to discard the moral, and to look solely at the material results in legislation, that it is difficult to get our legislature to act upon such considerations, unless they are shown to be in harmony with our greatest material good: unless in a pecuniary point

of view we are the gainers. It is this end alone that can furnish sufficient ground for action. If our moral and intellectual good are promoted, so much the better; but the first and not the last must furnish our excuse for action.

In the case before us it is said that the act is for the benefit of the States to which the lands are granted, and that Maine for instance gains nothing by the grant. It is very easy to show that the contrary is the truth. Maine is a manufacturing and commercial State. The West to a large extent is her customer. Now every additional avenue opened in that section, enables the western farmer to buy more than formerly, on account of greater cheapness of transportation. The same cause, too, reduces the cost of the provisions which the eastern manufacturer obtains from the West. The West will undoubtedly receive a greater benefit than Maine from the grant, but this constitutes no reason against it, unless it can be shown that Maine, in common with the East, derives a less advantage from the construction of the above roads than the value of her portion of the lands ceded. We think that there can be no doubt but that the East would be the gainer by the bargain. It may not be easy to prove this in the case before us, because the data for it can only follow their construction. But the influence of similar works may serve as a guide for this. How is it with the Erie canal? Has not every New England State derived a greater advantage from this work than its whole cost, in the diminished price of their food, a greater part of which reaches them through that channel, and in the outlet it has opened for forwarding to the western consumer the products of the East? Has not Massachusetts been benefited by this canal to an amount ten times greater than its cost? There can be no doubt of this. Other States are benefited in the same proportion to which they use it. Yet these States would undoubtedly have opposed any grant of lands to aid its construction, notwithstanding they were so deeply interested in its success. What is true of the Erie canal is true of every public work in the United States. The only difference is in the degree of benefit. The test of aid should be made to depend upon this degree. If the public generally are to derive a much greater advantage from the construction of a work than the amount of aid granted, there can be no objection against extending it, because the public is the gainer by the transaction. We believe that the above roads come within this rule. No works of the kind more important and general in their influences, can be constructed in any part of the Union. They unite the great Lake and the Gulf by the shortest possible line and by a route most favorable to a railroad. They are works of the first magnitude as to extent, and must be so as to their usefulness to the whole country.

But in the case before us, the States aided are to pay for one half of the land within the limits of their grant, and at a minimum rate of \$2 50 per acre. If the road should be constructed there can be no doubt but that they will readily command that sum. Government in such an event will get as much from these lands as she now asks for them. She will lose nothing, while those States interested in the roads will receive an immense benefit, which will be shared in common by our whole people.—We earnestly hope that the bill will become a law, as we think it will essentially aid in the construction of works thus assisted, and which without it we fear are beyond the ability of those constructing them to complete.

Patent Dust Arrestor for Railroad Cars.

The clouds of dust stirred up and attracted by railroad cars in motion are indeed a very great nuisance to passengers, and we are glad to find that this nuisance is about to be arrested by a very simple and ingenious contrivance. Mr. Cunningham, a mechanic, of Reading, Pa., has obtained a patent for preventing this dust nuisance, by means of jets of air passing across the windows in lines parallel to the sides of the carriage. The jets are obtained in this way: a fan is attached to the top of the carriage and worked by a strap which obtains motion from the axletrees, the revolution of the fan sending a blast through a chamber or closet running the whole length on the top of the carriage. A small pipe fed from this chamber passes down the side of the carriage between each window, and being plugged at the end the air forced from the chamber rushes through an elongated slot in a strong steady current—a sheet of rushing air—across the window. The blast tube consists of two parts, a plugged extremity perforated with one long vertical slot revolving around the tube connecting with the air chamber, so that the latter having two similar slots, one directly opposite the other, the direction of the current may be altered at pleasure, or if necessary shut off altogether. The slot blast apparatus may be made of block tin, at a cost of some fifty dollars, and obtaining a connection from one carriage to another by means of a flexible hose, six or eight carriages may be furnished with this really useful contrivance for about twenty five dollars each. Mr. Mitchel of the Western and Atlantic railroad, Georgia, is about to give the dust arrestor a trial on his road. This contrivance will furnish one of the luxuries of locomotion, for beside the arresting of dust, the rush of wind may be made to maintain the temperature in the hottest day of summer at a given point. Mr. Cunningham has our hearty good wishes: his invention is not more ingenious than it is useful.

AMERICAN RAILWAY GUIDE

FOR THE UNITED STATES.

We have omitted to speak of this work, which is issued monthly, "revised and corrected," and contains the running time of every railroad in the country, with distances, stopping places, etc., etc., together with all such information as every traveller wishes to carry in his pocket. It is illustrated by a map of the railroads in the United States, and we commend it to every person wishing the information it contains. C. Dinsmore, Publisher, 138 Fulton street, New York.

Ohio.

Every part of this great State is now thoroughly aroused to the work of railroad construction. Unlike many other States, Ohio is uniformly fertile and well settled, and nearly every portion of it well adapted to the building of railways. Almost every farmer in the State is now intent upon obtaining the advantages of these highways for the purpose of lessening the cost of transporting his products over the present inconvenient, and frequently impassable common roads.

Ohio is soon to have more miles railroad than any other State in the Union. For local purposes alone her citizens will not be content till every one is within a convenient distance of a road. This will secure their general construction. In addition to this such is her local position that she must have a large number of through lines, connecting the great water courses which bound her northern and southern frontier, and the railroads running to her eastern

and western border. All the great lines from the Northern, Eastern and Middle States, embracing Virginia, must run through Ohio. New England and New York will follow along the south shore of Lake Erie. Pennsylvania has adopted a line 50 or 60 miles south of this, running through Wooster, Mansfield, etc. Maryland will take the central route through Zanesville and Columbus; and Virginia the Belpre and Cincinnati railroad, running through Athens, Chillicothe, Hillsboro, etc., making four great lines through the State from east to west; all of them forming parts of great trunk lines running from the Atlantic to the Mississippi. These four roads cannot average much less than 225 miles each in length.

From north to south there is, first, the Cleveland and Pittsburgh railroad. The portion of the road embraced in Ohio is about 110 miles. Next the Cleveland, Columbus and Cincinnati. This road unites with the Little Miami at Xenia, 189 miles from Cleveland, and 65 from Cincinnati. Next comes the Columbus and Lake Erie railroad, which, in connection with the Scioto Valley railroad, will connect Sandusky and Portsmouth, on the Ohio, by a line of about 250 miles. Fourth, the Little Miami and Mad river railroad, connecting Sandusky and Cincinnati by a line of 218 miles, making an aggregate of through lines running north and south of 737 miles. To this last may be added the Cincinnati, Hamilton and Dayton railway, which though now building to Dayton, will without doubt be pushed north, following the valley of the Miami and the line of the Miami canal to the Maumee river and to Toledo; this making an additional line running through the State north and south, and adding about 225 miles to the above aggregate.

The above are the great trunk lines which are to run through this State. From each of these, branches are either in process of construction, or in contemplation, which will penetrate every considerable town in the State. Allowing that these branches with other roads which have or will soon be commenced, will make an extent of line equal to one-third of what we have enumerated, and we have an extent of over 2,500 miles as the probable amount of railroad which is soon to be in operation or in construction in this State.

This may seem a high, but we do not think that it is an extravagant estimate. There are in the New England States (not embracing Maine, one-half of which is still a forest,) 2,100 miles of railroad in operation within an area of 29,280 square miles, making one mile of railroad to every 14 square miles. The same ratio would give Ohio 2,850 miles of railroad. The time cannot be far distant when Ohio will have as many railroads in proportion to her territory as New England. It is much better adapted to the construction of these works. She possesses vastly greater natural resources than the former, and these works are much more necessary with her, from the difficulty of constructing good common roads, than with the Eastern States. From all these influences we have a right to expect that she will soon take the lead of all the Eastern States in the extent of these works.

Of the roads referred to, the Cleveland and Pittsburgh is under contract from the lake to the Ohio river, a distance of 98 miles. This part of it is in a state of great forwardness, and about 70 miles of it is to be opened during the year. The iron for this portion has been purchased by the bonds of the company in England. Connecting the Ohio and Lake Erie by the shortest possible line, it bids fair

to become a very important work, and must forever be without a rival, for the business appropriate to the route it occupies. Over it must pass a large amount of merchandise, to be distributed through the region bordering upon the Upper Ohio.

The Cleveland and Columbus railroad comes next in order. The road is nearly prepared for the iron, which is being rapidly laid. The Xenia and Columbus railroad is in successful operation. The Columbus and Lake Erie, extending from Mansfield, the southern terminus of the Sandusky and Mansfield railroad, to Newark, is nearly completed. South of this point the work of construction has not yet been commenced; but measures are now being taken to secure the necessary means. In addition to private subscriptions, the counties and the large towns along its line have authorized to subscribe largely to the work, and we believe that in no instance in this state has a town or county voted against the propositions to subscribe to railroads, when authorized to do so. Upon the lines running through the State east and west but little has been done, except upon the Ohio and Pennsylvania and the Bellefontaine and Indiana, which, together, will form a continuous line of 300 miles from Pittsburgh to the Indiana State line. A considerable portion of both of these roads is now under contract. Companies are now organizing for the construction of the Lake Shore road. That portion of it from Cleveland to the Pennsylvania State line has been surveyed, and we learn from good authority that no difficulty will be found in obtaining the necessary means of construction. The Shore road is a very important work for the purpose of connecting the roads now in progress from Buffalo to the Ohio State line, and the Michigan Southern, which is now in progress to the south shore of Lake Michigan and Chicago. From this last place a road is in progress to Galena on the Mississippi.

The Ohio Central has recently commenced operations. The first lettings will take place on the 20th inst. of that portion of the road between Zanesville and Newark, a distance of 26 miles. On the Belpre and Cincinnati road the work is under contract to Hillsboro, and a large portion of the remainder is being prepared for letting. Upon all of the above lines are the people of the sections through which they run able to prepare the road for the superstructure, by private subscriptions, without making use of those made in their public and corporate capacity, by the towns and counties. These should in all cases be reserved for the purchase of iron and the equipment. Where this cannot be done, the construction of the road can hardly be justified. Where the people do not possess sufficient means to prepare the road for the rails, there is a strong probability that they cannot give the road sufficient business to support it. They had better wait till they gain sufficient strength to do this.

In addition to these leading lines, there are many others of less extent in progress. Among them are the Iron railroad, from Ironton or Hanging Rock to the coal and iron mines of Jackson and Lawrence counties, and the Eaton and Hamilton railroad. A great many others are preparing to commence work, and will be in progress as soon as the necessary steps can be taken. These works, as we said before, will continue until the railroad shall become the common medium both for travel and transportation for the whole State.

In view of the immense demand which these works will create for iron, it becomes an interesting question, who shall furnish this important item.

Shall it be made from Welsh ores, and be transported 4,000 miles, and be paid for in wheat sent an equal distance, or shall it be made from the ores over which the roads are to run, and paid for by the wheat raised on the spot where it is consumed? Thus far the Welshman has had the market, shall he continue to retain it?

Missouri. Pacific Railway.

We omitted to mention at the proper time that upon the final organization of this company, the following gentlemen were chosen directors, viz:—John O'Fallon, Thomas Allen, James H. Lucas, D. D. Page, George Collier, James E. Yeatman, Edward Walsh, Luther M. Kennett and Louis A. LaBeaume.

At a subsequent meeting of the Board, William Allen, Esq., was elected President of the company, and will we presume have entrusted to him the principal management of the affairs of the road; for which place he is well qualified, and to which he is eminently entitled by reason of services in promoting this great work.

The friends of this road in the East, will be gratified to learn that James P. Kirkwood, Esq., late Superintendent of the New York and Erie railroad, has been appointed its Chief Engineer. Mr. Kirkwood carried with him the reputation of a skilful and thoroughly educated engineer, united with great executive ability in the field, and a very extended experience in his profession. A better selection could not have been made, both for the interest of the road and for the purpose of imparting to it the confidence of the capitalists in this section of the country.

NEW YORK AND ERIE RAILROAD.

Charles Minot, Esq., of Boston, has been chosen Superintendent of this road, in place of James P. Kirkwood, who vacated that office for the purpose of taking charge of the Engineering department of the Pacific railroad. Mr. Minot has been long and favorably known as Superintendent of the Boston and Maine railroad, and his appointment to his present office is no more than a just complement to the qualifications which fit him for the post he occupies.

Thomas S. Williams, Esq., late of the Sullivan railroad, New Hampshire, succeeds Mr. Minot as Superintendent of the Boston and Maine railroad.

Hudson River Railroad.

We learn from our exchanges, and from the advertisement of lettings which we copy from one of them, for the benefit of the contractors among our readers, that the directors have determined to put the work under contract from Poughkeepsie to Albany. As to the condition of the company, its means, liabilities, prospects, etc., we are not informed.

MANUFACTURE OF CAR WHEELS.

The Chattanooga Gazette says: "A company in Raleigh, N. C., has commenced the casting of car wheels, and will soon engage in manufacturing cars and locomotives. The same business will be commenced in this place, during the summer or fall, under the most favorable auspices. The business partner in the company is now in Pittsburgh, procuring an engine to propel the machinery, and carefully examining the structure of the buildings, and all the operations connected with the car manufacturing business. On his return the building will be put up, and the business commenced. We learn that in the last week, it has been determined to connect with the manufactory a rolling mill. This is a good move. The two branches of business should be connected, as they will be mutually beneficial."

Great American Engineering

AND MECHANICAL WORK, just published in medium folio, 75 cts.

Part IV of "Specimens of the Stone, Iron and Timber Bridges, Viaducts, Tunnels, &c. &c. of the United States Railroads." By George Duggan, Architect and Civil Engineer.

The present part contains beautifully executed plans, and elevations, of the Starucca, Pa., (stone) Viaduct of 17 arches, 50 feet span each, grade line averaging 90 feet above the valley bed, with the specifications, estimates, &c. &c. Also plates of the details of the timber and iron work of the elegant timber arch 275 feet span, at Cascade Creek, Pa. on the line of the N. Y. & Erie R. R.

N.B.—This work is published by subscription of the most eminent in the engineering profession of the U. States, and will be completed in 12 parts, at 75 cents each to those who remit their names and subscriptions before the 1st June next—when the first 6 parts or one half of the work will be published—after which the price will be raised to \$1 per part.

To those making a present remittance of \$5, and the remainder \$4, when they have been supplied with the first six parts, the work will be forwarded regularly as published. Parties remitting \$9 shall receive it monthly ~~post-free~~ in any part of the United States.

"It is a work that was a great desideratum, and must prove of great benefit to the engineering profession generally, and especially to the tyro in practical engineering and mechanical knowledge; in truth it strikes us, that it would require years of labor and patient toil on the part of a young engineer to prepare the drawings, and collect the information that will be embodied in this work, and can now be secured for the trifling sum of \$9"—[Scientific Amer. March 16, 1850.]

In connection with this subject (Iron Railroad Structures) we take occasion to call attention again to Mr. Duggan's valuable and expensive publication, exhibiting drawings, with full descriptions of the various stone, iron and wooden bridges, viaducts, tunnels, culverts, etc., of all the Railroads in the United States. Mr. Duggan is an accomplished Architect and Civil Engineer, who came from Ireland to this country to exercise his profession; but finding railroad construction here, in many respects, different from that he had been accustomed to in Europe, he applied himself to the study of our system; and the fruits of his researches and investigations embodied in this work, are well calculated to meet the exigencies of engineers, and to assist draughtsmen, bridge builders, mechanics and students. The work will be supplied to subscribers only, in 12 parts, at 75 cents each.—[N. Y. Journal of Commerce, Feb. 14, 1850.]

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Pig Iron, Salt, etc., etc., for sale at the lowest market price. Apply to

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November, 23, 1849.

FAIRBANKS' RAILROAD SCALES.—THE

subscribers are prepared to construct at short notice, Railroad and Depot Scales, of any desired length and capacity. Their long experience as manufacturers—their improvements in the construction of the various modifications, having reference to strength, durability, retention of adjustment, accuracy of weight and dispatch in weighing—and the long and severe tests to which their scales have been subjected—combine to ensure for these scales the universal confidence of the public.

No other scales are so extensively used upon railroads, either in the United States or Great Britain;—and the managers refer with confidence to the following in the United States.

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Old Colony Railroad.	Fitchburg Railroad.
Schenectady Railroad.	Syracuse and Utica Road.
Balt. and Ohio Railroad.	Baltimore and Susq. Road.
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Central (Ga.) Railroad.	Macon and Western Road.
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And other principal Railroads in the Western, Middle and Southern States.

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Agents, } FAIRBANKS & Co., 81 Water St., N. York.
} A. B. NORRIS, 196 Market St. Philadelphia.
April 22, 1849. 1v*17

Machinery Oil.

WE the undersigned are now manufacturing an oil intended for the use of Railroads, Steamers and Manufacturing establishments. It has been in use several months and has given very general satisfaction. Our price is uniformly 70 cts. per gallon. Enquiries or orders attended to promptly. Address

ROBBINS, LANGDON & CO.,
133 Water street, corner Pine, New York.

CERTIFICATES.

Providence, March 22d, 1850.

Messrs. Robbins, Langdon & Co.,

Gentlemen: We have given your machine oil a thorough trial, and find that it possesses all the qualities that we could wish, as it works better than any sperm oil we have ever used. Our shafts that required oiling four times a day with the best sperm oil that we could get, work equally as well by the application of your oil twice a day, and your oil stands cold weather much better than any oil we have ever used. Our engineer having had years' experience in running and making engines, we put great confidence in his judgment, and he gives it as his opinion that your oil is fully equal to if not better than any he ever used; and we shall soon give you an order for more, as we do not want any other kind of oil as long as we can get yours.

Very respectfully yours,

JACKSON, CLARK & CO.

Messrs. Robbins, Langdon & Co.,
Gentlemen: We have given your machinery oil a thorough trial, and find that it possesses all the qualities that we could wish, as it works better than any sperm oil we have ever used. Our shafts that required oiling four times a day with the best sperm oil that we could get, work equally as well by the application of your oil twice a day, and your oil stands cold weather much better than any oil we have ever used. Our engineer having had years' experience in running and making engines, we put great confidence in his judgment, and he gives it as his opinion that your oil is fully equal to if not better than any he ever used; and we shall soon give you an order for more, as we do not want any other kind of oil as long as we can get yours.

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Very respectfully yours,

JACKSON, CLARK & CO.

Steamer Bay State, Oct. 22d, 1849.

Messrs. Robbins, Langdon & Co.,

Gentlemen: In answer to your request for my testimony as to the machinery oil manufactured by you, I will say that I have used it for some time past on the Bay State, and am perfectly satisfied that your statement to me of its good qualities, is correct. As far as its lasting properties go, it wears equally long as sperm oil, runs perfectly free, and has no appearance of thickening. As seeing is better than hearing, I would recommend you to send your friends on board our boat, and they can then, by ocular demonstration, judge for themselves. Yours respectfully, **JOHN GRAY**,
Engineer of Steamer Bay State, Pier 3, N.R.

Steamboat Knickerbocker, Sept. 22, 1849.

Gentlemen: Mr. Hall, Agent of the Norwich and New London Steamboat Co., placed in my hands some of your machinery oil, which he desired me to use on the engine and other machinery, which I have done, and was so much pleased with the working, that I recommended the owners to give you their orders.

I have been using the article since August 19, and with perfect satisfaction, and I am well satisfied that your oil is as good as the best of sperm for lubricating machinery. I am yours very respectfully,

SAMUEL CARTER

Engineer of Steamboat Knickerbocker, Pier 18, N.R.
To Messrs. Robbins, Langdon & Co.,
Oil Merchants, 133 Water street, New York.

Steamboat Worcester, N. York, Oct. 15, 1849.

Messrs. Robbins, Langdon & Co.,

Gentlemen: I beg to acknowledge the receipt of your letter requesting my opinion as to your oil for machinery, which I had not time to reply to previous to my return to Norwich. I have been using your oil on the engine and machinery of the Worcester with perfect success, and have much pleasure in testifying as to its good qualities. In my opinion, the journals keep cooler with your oil than with sperm, and it wears equally well. Should you at any time wish to see me as to your oil, I beg you will do so without hesitation. Yours respectfully, **JAS. CROOKER**,
Engineer Steamboat Worcester, Pier 18, N. R.

New York, August 3d, 1849.

Messrs. Robbins, Langdon & Co.,

Gentlemen: I received your letter in regard to your oil for machinery, which I handed to our engineer, and have much pleasure in sending you an extract from his letter to me on the subject: "I have applied the oil sent me upon our hot journals and cylinders, and find that they keep cooler with it than with sperm oil. I cannot find any fault with the oil, although I have watched it carefully. I have also tried it against an equal quantity of sperm oil, and find it wears quite as well." You are quite at liberty to show this extract to your friends, and shall be happy to give any further certificate you may require. **WM. RIDER**,
Treasurer Union India-rubber Co., 19 Nassau st. N. Y.

New York, March 22d, 1850.

Messrs. Robbins, Langdon & Co.,

Gentlemen: I have been using your machinery oil on the engine and other machinery of the Steamer Southerner running from this to Charleston, and find it equal to sperm oil. I shall continue the use of the same, and you are at liberty to refer to me at any time.

Yours respectfully, **DAVID N. MAXON**,
Chief Engineer Steamer Southerner.

Steamboat C. Vanderbilt, N. York, Oct. 11, 1849.

Messrs. Robbins, Langdon & Co.,

Gentlemen: In reply to your inquiries respecting the qualities of your machinery oil, I am happy to inform you that I have been using the article sent me for some time past, not only on the engine but on all other machinery connected with it; and from a careful and close examination, I am well satisfied that your oil is as good as the best of sperm oil for lubricating machinery. I have recommended Mr. Lockwood the agent of the company, to give you their orders.

Yours respectfully, **JAMES BAKER**,
Engineer Steamboat C. Vanderbilt, Pier 3, N.R.

Brooklyn, August 29, 1849.

Messrs. Robbins, Langdon & Co.,

Gentlemen: Your letter of the 29th was received, and I am happy to inform you that I have used your machinery oil throughout my establishment, and I am still of the opinion that it is as good as the best of sperm oil for lubricating machinery. I should be pleased at any time to have your friends witness the working, and I am sure, after once doing so, will give you their orders. Please send me another cask by the evening of the 3d, and by so doing you will much oblige,

W. M. BURDON, Manufacturer of
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American Railway Guide, AND POCKET COMPANION FOR THE UNITED STATES;

CONTAINING Correct Tables, showing the time for starting of trains from all stations, distances, fares, etc., on all the Railway lines in the U. States; also many of the principal Steamboat and Stage routes—accompanied by a complete RAILWAY MAP. Price, single copies 10 cts., or \$1 per annum. Published on the first of every month, corrected from returns furnished by the Railway Superintendents throughout the Union.

This book has been compiled somewhat on the plan of Bradshaw's Guide, with such improvements in size, form and arrangement as have seemed desirable; and the publisher confidently hopes it will not be found liable to the objections of incompleteness and incorrectness, which have been made, and justly too, against various other similar works heretofore issued.

The subscriber having had the management of the NEW YORK PATHFINDER almost from its commencement, has enjoyed superior facilities in obtaining information relating to the thoroughfares of travel, and is therefore well qualified to prosecute with success the arduous undertaking of furnishing a complete and correct national guide book.

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ENGINEERS.

Atkinson, T. C.,

Alexandria and Orange Railroad, Alexandria, Va.

Baneks, C. W.,

Civil Engineer, Vicksburg, Miss.

Berrien, John M.,

Michigan Central Railroad, Marshall, Mich.

Buckland, George,

Troy and Greenbush Railroad.

Clement, Wm. H.,

Little Miami Railroad, Cincinnati, Ohio.

Cozzens, W. H.,

Engineer and Surveyor, St. Louis, Mo.

Alfred W. Craven,

Chief Engineer Croton Aqueduct, New York.

Davidson, M. O.,

Eckhart Mines, Alleghany Co., Maryland.

Fisk, Charles B.,

Cumberland and Ohio Canal, Washington, D. C.

Felton, S. M.,

Fitchburgh Railroad, Boston, Mass.

Floyd-Jones, Charles,

South Oyster Bay, L. I.

Gzowski, Mr.,

St. Lawrence & Atlantic Railroad, Montreal, Canada.

Gilbert, Wm. B.,

Rutland and Burlington Railroad, Rutland, Vt.

Grant, James H.,

Nashville and Chattanooga R. R., Nashville, Tenn.

Harry, P.,

Binghamton, New York.

S. W. Hill,

Mining Engineer and Surveyor, Eagle River, Lake Superior.

Holcomb, F. P.

Southwestern Railroad, Macon, Ga.

Johnson, Edwin F.

New York and Boston Railroad, Middletown Ct.

Latrobe, B. H.,

Baltimore and Ohio Railroad, Baltimore, Md.

Miller, J. F.,

Worcester and Nashua Railroad, Worcester, Mass.

Morris, Elwood,

Schuylkill Navigation, Schuylkill Haven, Pa.

Morton, A. C.,

Atlantic and St. Lawrence Railroad, Portland, Me.

McRae, John,

South Carolina Railroad, Charleston, S. C.

Nott, Samuel,

Lawrence and Manchester Railroad, Boston.

Prichard, M. B.,

East Tennessee and Georgia R. R., Cleveland, Tenn.

Roebbling, John A.,

Trenton, N. J.

W. Milnor Roberts,

Bellefontaine and Indiana Railroad, Marion, Ohio.

Roberts, Solomon W.,

Ohio and Pennsylvania Railroad, Pittsburgh, Pa.

Sanford, C. O.,

South Side Railroad, Virginia.

Schlatter, Charles L.,

Northern Railroad (Ogdensburg), Malone, N. Y.

Sours, Peter,

Rahway, New Jersey.

Stark, George.,

Bost., Con. and Mont. R. R., Meredith Bridge, N. H.

Steele, J. Dutton,

Pottstown, Pa.

Trimble, Isaac R.,

Philad., Wil. & Baltimore Railroad, Wilmington, Del.

Tinkham, A. W.,

United States Fort, Bucksport, Me.

Thomson, J. Edgar.,

Pennsylvania (Central) Railroad, Philadelphia.

Troost, Lewis,

Alabama and Tennessee Railroad, Selma, Ala.

Whipple, S.,

Civil Engineer and Bridge Builder, Utica, N. Y.

Williams, E. P.,

Auburn and Schenectady Railroad, Auburn, N. Y.

Williams, Charles H.,

Milwaukee, Wisconsin.

HOTELS.

JONES' HOTEL,

NO. 152 CHESTNUT STREET,
PHILADELPHIA.

BRIDGES & WEST, Proprietors.

DUNLAP'S HOTEL,

On the European Plan,
NO. 135 FULTON STREET,
Between Broadway and Nassau St.,
NEW YORK.

BUSINESS CARDS.

J. T. Hodge

Will attend to the examination of mining tracts near Lake Superior, and prepare Reports and Maps.

Address, during the Summer,
Ontanagon Postoffice, Lake Superior.

Cumberland Steam Coal,

FROM THE
FROSTBURG MINES, MD.

H. A. TUCKER,

Agent of Frostburg Coal Co.

No. 28 Merchants' Exchange, New York.

Eaton, Gilbert & Co.,

Railroad Car, Coach and Omnibus Builders,
TROY, N. Y.

Nathan Caswell,

METAL BROKER, 69 WALL ST., N. Y.

For the Purchase and Sale of Railroad Iron (new and old,) Boiler Plates, Pig and Bar Iron, Lead, Tin, Copper, Spelter, etc. Refers to

Messrs. Boorman, Johnston, & Co., New York.

" Grinnell, Minturn & Co., "

" Barston, Pope & Co., "

" Earps & Brink, Philadelphia.

" E. Pratt & Brother, Baltimore.

John Barstow, Esq., Providence.

Lewis Bullard, Esq., Boston.

February 9, 1850.

6m*

United States Railroad Guide and Steamboat Journal.

CONTAINING OFFICIAL TIME ADVERTISEMENTS, Tables of Stations, Distances, Fares, Time, etc., with much miscellaneous matter for the travelling public. Price 12 cents a copy. Yearly subscription \$1. Published at 43 Ann street, New York.

J. & Riley Carr,

Manufacturers of Cast, Shear, German and Blister

STEEL,

Of all Descriptions, Warranted Good.

BAILEY-LANE WORKS, SHEFFIELD.

R. S. DENTON, Agent,

NO. 20 CLIFF ST., NEW YORK.

STEEL AND FILES.

R. S. Denton,

20 CLIFF STREET, NEW YORK,

AGENT FOR

J. & Riley Carr's

BAILEY-LANE WORKS, SHEFFIELD,

Manufacturers of Cast, Shear, German and Blister

STEEL

Of all descriptions. Warranted Good

FILES.

Manufacturers of Machinists' Warranted Best Cast Steel Files, expressly for working upon Iron and Steel, made very heavy for recutting.

A full Stock of Steel and Files at all times on hand.

6m4

Walter R. Johnson,

CIVIL AND MINING ENGINEER AND ATTORNEY for Patents. Office and Laboratory, F St., opposite the Patent office, Washington, D. C.

Dudley B. Fuller & Co.,

IRON COMMISSION MERCHANTS,

No. 139 GREENWICH STREET,

NEW YORK.

Manning & Lee,

GENERAL COMMISSION MERCHANTS,

NO. 51 EXCHANGE PLACE,

BALTIMORE.

Agents for Avalon Railroad Iron and Nail Works, Maryland Mining Company's Cumberland Coal 'CED'—Potomac and other good brands of Pig Iron.

Cop Waste.

CLEAN COP WASTE, suitable for cleaning Railroad, Steamboat and Stationary Engines, constantly on hand and for sale by

KENNEDY & GELSTON,

54 Pine St., New York.

October 27, 1849,

3m

Ranstead, Dearborn & Co.,

MANUFACTURERS OF

LOCOMOTIVE CRANKS AND CAR AXLES,

ALSO

WROUGHT IRON SHAFTING,

And All Kinds of Hammered Shapes.

Forge at Commercial Point, Dorchester,

Office 25 Foster's Wharf, opposite No. 211 Broad St.

BOSTON.

Henry J. Ibbotson,

IMPORTER of Sheffield and Birmingham Goods.

Also, Agent for the Manufacture of Telegraph Wire.

218 PEARL ST., NEW YORK.

Cumberland, (Md.) Coals for Steaming, etc.

ORDERS RECEIVED FOR AND FILLED by J. COWLES, 37 Wall St., N. Y.

**Railroad Car Manufacturer's
Furnishing Store.****F. S. & S. A. MARTINE,**

IMPORTERS AND MANUFACTURERS OF

**RAILROAD CAR &
CARRIAGE LININGS,**PLUSHES, CURTAIN MATERIALS, ETC.,
119 WILLIAM ST., NEAR JOHN.3-4 and 6-4 Damasks, Union and Worsted; Mo-
reens, Rattinetta, Cloths, Silk and Cotton Velvets,
English Bunting**To Engineers and Surveyors.****E. BROWN AND SON** Mathematical inst. mak-
ers No. 27 Fulton Slip, New York, make and keep
for sale, Theodolites, Levelling inst., Levelling rods,
Surveyors Compasses, and Chains, Cases of Mathe-
matical drawing insts. various qualities, together with
a general assortment of Ivory Scales and small insts.
generally used by Engineers.**Samuel Kimber & Co.,****COMMISSION MERCHANTS**

WILLOW ST. WHARVES, PHILADELPHIA.

AGENTS for the sale of Charcoal and Anthracite
Pig Iron, Hammered Railroad Car and Locomo-
tive Axles, Force Pumps of the most approved con-
struction for Railroad Water Stations and Hydraulic
Rams, etc., etc.
July, 27, 1849.**James Herron, Civil Engineer,**OF THE UNITED STATES NAVY YARD,
PENSACOLA, FLORIDA,

PATENTEE OF THE

HERRON RAILWAY TRACK.Models of this Track, on the most improved plans,
may be seen at the Engineer's office of the New York
and Erie Railroad.**To Railroad Companies.****—WROUGHT IRON WHEELS—**
SAFETY AND ECONOMY.**NORRIS' LOCOMOTIVE WORKS,
SCHENECTADY, NEW YORK,**Are Manufacturing Wrought Iron Driving, Truck,
Tender, and Car Wheels—made from the best Ameri-
can Iron. Address **E. S. NORRIS.**
May 16, 1849.**Machinery Warehouse.****S. C. HILLS**, No. 43 Fulton street, New York, has
constantly for sale Steam Engines, Boilers, Lathes,
Chucks, Drills, Planers, Force and Suction Pumps;
Tenoning, Mortising and Boring Machines, Shingle
Machines, Bolt and Nut Machines, Belting, Oil, Iron
and Lead Pipe; Rubber, Percha and Leather Hose,
&c., &c.**S. C. H.'s** arrangements with several machine shops
are such that he can supply, at very short notice, large
quantities of machinery.

November 23, 1849.

**George O. Robertson,
BROKER IN SCOTCH AND
AMERICAN PIG IRON;**Bar Iron, Lead, Spelter, Tin, Copper, etc.,
No. 4 Liberty Place, MAIDEN LANE,
(Near Broadway.)
NEW YORK**Manufacture of Patent Wire
ROPE AND CABLES,**For Inclined Planes, Suspension Bridges, Standing
Rigging, Mines, Cranes, Derrick, Tilters, &c., by
JOHN A. ROEBLING, Civil Engineer,
TRENTON, N. J.**Samuel D. Willmott,**MERCHANT, AND MANUFACTURER OF
CAST STEEL WARRANTED SAWS,
—AND FILES—IMPORTER OF THE
GENUINE WICKESLY GRINDSTONES
NO. 8 LIBERTY STREET,
NEW YORK.**Doremus & Harris,**ANALYTICAL & CONSULTING CHEMISTS,
179 BROADWAY, NEW YORK.
SCHOOL OF CHEMISTRY.**IRON.****Railroad Iron.****3,000 TONS C. L. MAKE** 63½ lbs. per yard,
now landing and to arrive.Also contracts made for future delivery of above su-
perior make English Iron.

300 Tons Banks Best Iron, Round, Square and Flat.

200 " English Bar " " " "

10 " 9-16 Square Iron for Railroad Spikes.

For sale in lots to suit purchasers by

DAVID W. WETMORE.
New York, March 26, 1850. 3m**SPRING STEEL FOR LOCOMOTIVES, TEN-****DERERS AND CARS.**—The subscriber is engaged
in manufacturing spring steel from 1½ to 6 inches in
width, and of any thickness required: large quantities
are yearly furnished for railroad purposes, and wher-
ever used its quality has been approved of. The estab-
lishment being large, can execute orders with great
promptitude, at reasonable prices, and the quality war-
ranted. Address **J. F. WINSLOW, Agent,**
Albany Iron and Nail Works.**Railroad Iron.****THE** Undersigned, Agents for Manufacturers, are
prepared to contract to deliver Rails of superior
quality, and of any size or pattern, to any ports of dis-
charge in the United States.**COLLINS, VOSE & CO.,**
158 South St.

New York, November 17, 1849.

Railroad Iron.

1,500 Tons weighing 59 lbs. per lineal yard.

500 " " 57 " " "

500 " " 56 " " "

500 " " 60 & 61 lbs. " "

Also 2½ ft flat rails. All the above being of approv-

ed patterns. For sale by

DAVIS, BROOKS, & CO.,

69 Broad street.

N.B.—Rails imported on commission, or at a fixed

price.

Iron.Pig Iron, Anthracite and Charcoal; Boiler and Flue
Iron, Spring and Blistered Steel, Nail Rods, Best Re-
fined Bar Iron, Railroad Iron, Car Axles, Nails, Stove
Castings, Cast Iron Pipes of all sizes, Railway Chairs
of approved patterns for sale by**COLEMAN, KELTON & CAMELL,**

109 N. Water St., Philadelphia.

IRONDALE PIG METAL, MANUFACTURED

and for sale by the Bloomsburg Railroad Iron Co.

DUDLEY FISHER, Treasurer.

75 N. Water St., Philadelphia.

Railroad Iron.**500** Tons, afloat, weighing 57 pounds per lineal
yard, for sale by**COLLINS, VOSE & CO.,**

158 South St.

New York, November 17, 1849. 1m46

Railroad Iron.**1675** Tons, weighing about 61 lbs. per yard, 90
tons, weighing about 52 lbs. per yard, and
825 tons, weighing about 53½ lbs. per yard, of the lat-
est and most approved patterns of T rail, for sale by
BOORMAN, JOHNSTON & CO.,
119 Greenwich street.

New York, Feb. 25, 1850.

N.B.—B. J. & Co are also prepared to take con-
tracts for English rails, delivered in any of the Atlan-
tic ports of the United States.**Railroad Iron.****THE** UNDERSIGNED, HAVING made arrange-
ments abroad, are prepared to contract for the de-
livery of Foreign rails, of approved brands upon the
most favorable terms.They will also make contracts for American rails,
made at their Trenton works, from Andover Iron, in
whole or in part, as may be agreed upon.They are prepared to furnish Telegraph, Spring and
Market Wire; Braziers and Wire Rods; Rivets and
Merchant Bars to order, all made exclusively from An-
dover Iron. The attention of parties who require iron
of the very best quality for special purposes, is respect-
fully invited.**COOPER & HEWITT,**

17 Burling Slip, New York.

February 15, 1850.

Glendon Refined Iron.Round Iron, Band Iron, Hoop Iron,
Square " Flat " Scroll "

Axles, Locomotive Tyres,

Manufactured at the Glendon Mills, East Boston, for
sale by **GEORGE GARDNER & CO.,**

5 Liberty Square, Boston, Mass.

Sept. 15, 1849. 3m37

**PATENT HAMMERED RAILROAD, SHIP &
BOAT SPIKES.**—The Albany Iron Works
have always on hand, of their own manufacture, a
large assortment of Railroad, Ship and Boat Spikes
from 2 to 12 inches in length, and of any form of head;
From the excellence of the material always used in
their manufacture, and their very general use for rail-
roads and other purposes in this country, the manu-
facturers have no hesitation in warranting them fully
equal to the best spikes in market, both as to quality
and appearance. All orders addressed to the subscrib-
ers at the works will be promptly executed.**JOHN F. WINSLOW, Agent.**Albany Iron and Nail Works, Troy, N. Y.
The above Spikes may be had at factory prices, of
Erastus Corning & Co Albany; **Merritt & Co.** New
York; **E. Pratt & Brother**, Es. 22nd St. Md**LAP—WELDED
WROUGHT IRON TUBES**

FOR

TUBULAR BOILERS,FROM ONE AND A QUARTER TO SEVEN
INCHES IN DIAMETER.**THE** ONLY Tubes of the same quality and man-
ufacture as those so extensively used in England,
Scotland, France and Germany, for Locomotive, Ma-
rine and other Steam Engine Boilers.**THOMAS PROSSER & SON**, Patentees,
28 Platt street, New York.**Railroad Iron.****THE** UNDERSIGNED ARE PREPARED TO
contract for the delivery of English Railroad Iron
of favorite brands, during the Spring. They also re-
ceive orders for the importation of Pig, Bar, Sheet, etc.
Iron.**THOMAS B. SANDS & CO.,**22 South William street,
New York.

February 3, 1849.

Iron Store.**THE** Subscribers, having the selling agency of the
following named Rolling Mills, viz: Norristown,
Rough and Ready, Kensington, Triadelphia, Potts-
grove and Thorndale, can supply Railroad Companies,
Merchants and others, at the wholesale mill prices for
bars of all sizes, sheets cut to order as large as 58 in.
diameter; Railroad Iron, domestic and foreign; Loco-
motive tire welded to given size; Chairs and Spikes;
Iron for shafting, locomotive and general machinery
purposes; Cast, Shear, Blister and Spring Steel; Boil-
er rivets; Copper; Pig iron, etc., etc.**MORRIS, JONES & CO.,**

Iron Merchants,

Schuylkill 7th and Market Sts., Philadelphia.

August 16, 1849.

1y33

Railroad Iron.**THE** MOUNT SAVAGE IRON WORKS, AL-
legany county, Maryland, having recently pass-
ed into the hands of new proprietors, are now prepar-
ed, with increased facilities, to execute orders for any
of the various patterns of Railroad Iron. Communi-
cations addressed to either of the subscribers will have
prompt attention. **J. F. WINSLOW, President**

Troy, N. Y.

ERASTUS CORNING, Albany.**WARREN DELANO, Jr.**, N. Y.**JOHN M. FORBES**, Boston.**ENOCH PRATT**, Baltimore, Md.

November 6, 1848.

Railroad Iron.**THE** SUBSCRIBERS ARE PREPARED TO
take orders for Railroad Iron to be made at their
Phoenix Iron Works, situated on the Schuylkill Riv-
er, near this city, and at their Safe Harbor Iron Works,
situated in Lancaster County, on the Susquehanna
river; which two establishments are now turning out
upwards of 1800 tons of finished rails per month.Companies desirous of contracting will be promptly
supplied with rails of any required pattern, and of the
very best quality.**REEVES, BUCK & CO.,**

45 North Water St., Philadelphia;

March 15, 1849.

Monument Foundry.

A. & W. DENMEAD & SON,
Corner of North and Monument Sts.,—Baltimore,

HAVING THEIR

IRON FOUNDRY AND MACHINE SHOP

In complete operation, are prepared to execute faithfully and promptly, orders for Locomotive or Stationary Steam Engines, Woolen, Cotton, Flour, Rice, Sugar Grist, or Saw Mills,

Slide, Hand or Chuck Lathes, Machinery for cutting all kinds of Gearing. Hydraulic, Tobacco and other Presses, Car and Locomotive patent Ring Wheels, warranted,

Bridge and Mill Castings of every description, Gas and Water Pipes of all sizes, warranted, Railroad Wheels with best faggoted axle, furnished and fitted up for use, complete

Being provided with Heavy Lathes for Boring and Turning Screws, Cylinders, etc., we can furnish them of any pitch, length or pattern.

Old Machinery Renewed or Repaired—and Estimates for Work in any part of the United States furnished at short notice.

June 8, 1849.

Iron Wire.

REFINED IRON WIRE OF ALL KINDS,
Card, Reed, Cotton-flyer, Annealed, Broom, Buckle, and Spring Wire. Also all kinds of Round, Flat or Oval Wire, best adapted to various machine purposes, annealed and tempered, straightened and cut any length, manufactured and sold by

ICHABOD WASHBURN.

Worcester, Mass., May 25, 1849.

American and Foreign Iron.

FOR SALE,

300 Tons A 1, Iron Dale Foundry Iron.
100 " 1, " " "
100 " 2, " " "
100 " " Forge " "
400 " Wilkesbarre " "
100 " "Roaring Run" Foundry Iron.
300 " Fort " "
50 " Catocin " "
250 " Chikiswalungo " "
56 " "Columbia" "chilling" iron, a very superior article for car wheels.
75 " "Columbia" refined boiler blooms.
30 " 1 x 1/2 Slit iron.
50 " Best Penna. boiler iron.
50 " "Puddled" " "
50 " Bagnall & Sons refined bar iron.
50 " Common bar iron.

Locomotive and other boiler iron furnished to order.

GOODHUE & CO.,

New York.

64 South street

American Pig, Bloom and Boiler Iron.

HENRY THOMPSON & SON,
No 57 South Gay St., Baltimore, Md.,
Offer for sale, Hot Blast Charcoal Pig Iron made at the Calocin (Maryland), and Taylor (Virginia), Furnaces; Cold Blast Charcoal Pig Iron from the Cloverdale and Calawaba, Va., Furnaces, suitable for Wheels or Machinery requiring extra strength; also Boiler and Flue Iron from the mills of Edge & Hilles in Delaware, and best quality Boiler Blooms made from Cold Blast Pig Iron at the Shenandoah Works, Va. The productions of the above establishments can always be had at the lowest market prices for approved paper.

American Pig Iron of other brands, and Rolled and Hammered Bar Iron furnished at lowest prices. Agents for Watson's Perth Amboy Fire Bricks, and Rich & Cos. New York Salamander Iron Chests.

Baltimore, June 14, 1849.

6 mos

Wheel, Forge and Foundry Iron.

LOCUST GROVE Wheel Iron of great strength and superior chilling property.
Balt. Charcoal Forge Iron, from Patuxent, Curtis Creek and Gunpowder furnaces.

Elkridge Foundry Iron, of superior strength and softness. Anthracite and Charcoal Iron from Pennsylvania and Virginia. Gas and Water Pipes, Lamp Posts from Elkridge furnace.

LEMMON & GLENN,

6m9

62 Buchanan's Wharf, Baltimore.

Iron.

THE SUBSCRIBERS having resumed the agency of the New-Jersey Iron Company, are prepared to execute orders for the different kinds and sizes of Iron usually made at the works of the company, and offer for sale on advantageous terms.—

150 tons No. 1 Boonton Foundry Pig Iron.
100 " No. 2 do. do. do.
300 " Nos. 2 & 3 Forge do. do.
100 " No. 2 Glendon do. do.
140 " Nos. 2 & 3 Lehigh Crane do do.
100 " No. 1 Pompton Charcoal do.
100 " New-Jersey Blooms
50 " New-Jersey Faggoting Iron, for shafts
Best Bars, 1/2 to 4 inch by 1/2 to 1 inch thick.
Do do Rounds and Squares, 1/2 to 3 inch.
Rounds and Squares, 3-16 to 1 inch.
Half Rounds, 1/2 to 1 in. Ovals & Half Ovals 1/2 to 1 1/2 in.
Bands, 1/2 to 4 inch. Hoops, 1/2 to 2 inch.
Trunk Hoops, 1/2 to 1 1/2 in. Horse Shoe & Nut Iron.
Nail Plates. Railroad Spikes.

DUDLEY B. FULLER & Co., 139 Greenwich-st. and 85 Broad-st.

WILLIAM JESSOP & SONS' CELEBRATED CAST-STEEL.

The subscribers have on hand, and are constantly receiving from their manufactory,

PARK WORKS, SHEFFIELD,

Double Refined Cast Steel—square, flat and octagon.
Best warranted Cast Steel—square, flat and octagon.
Best double and single Shear Steel—warranted.
Machinery Steel—round.

Best and 2d gy. Sheet Steel—for saws and other purposes.

German Steel—flat and square, "W. I. & S." "Eagle" and "Goat" stamps.

Genuine "Sykes," L Blister Steel.

Best English Blister Steel, etc., etc., etc.

All of which are offered for sale on the most favorable terms by

WM. JESSOP & SONS,

91 John street, New York.

Also by their Agents—

Curtus & Hand, 47 Commerce street, Philadelphia.

Alex'r Fullerton & Co., 119 Milk street, Boston.

Stickney & Beatty, South Charles street, Baltimore.

May 6, 1848.

JOHNSON, CAMMELL & Co's Celebrated Cast Steel,

AND
ENGINEERING AND MACHINE FILES,
which for quality and adaptation to mechanical uses, have been proved superior to any in the United States. Every description of square, octagon, flat and round cast steel, sheet, shovel and railway spring steel, best double and single shear steel, German steel, flat and square, goat stamps, etc. Saw and file steel, and steel to order for any purposes, manufactured at their Cyclops Steel Works Sheffield.

JOHNSON, CAMMELL & CO.,

100 William St., New York.

November 23 1849.

Railroad Iron.

OF ANY PATTERN AND WEIGHT,
Of a Favorite Brand,

And deliverable in Bond, or Duty paid, at any Port of the U. S., contracted for on favorable terms, by

CHARLES ILLIUS,

20 Beaver St., New York.

Pig and other Iron also contracted for. Sole Agent for "Baxter's Machine and Burning Oil"—particularly adapted for "Railroads" and other Machinery.—Preferred to Sperrin by the many now using it, and 25 per cent. cheaper.

CUT NAILS OF BEST QUALITY, BAR IRON

(including Flat Rails) manufactured and for sale by
FISHER, MORGAN & CO.,
75 N. Water St., Philadelphia.

Ogden & Martin's ROSENDALE CEMENT.

WE are prepared to enter into arrangements for supplying our Cement for public works or other purposes. We warrant the cement equal in every respect to any manufactured in this country. It attains a great degree of hardness, sets immediately under water, and is a superior article for masonry coming in contact with water, or requiring great strength.

For sale in tight barrels, well papered, at their office by
OGDEN & MARTIN, 104 Wall st.

February 16, 1850.

The above cement is used in most of the fortifications building by government.

To Steam Engine Builders.

THE Undersigned offer for sale, at less than half its cost, the following new machinery, calculated for an engine of 62 inches cylinder and 10 feet stroke, viz.

- 2 Wrought Iron Cranks, 60 inches from centre to centre.
- 1 Do. do. Connecting Rod Strap.
- 2 Do. do. Crank Pins.
- 1 Eccentric Strap.
- 1 Diagonal Link with Brasses.
- 1 Cast Iron Lever Beam (forked).

The above machinery was made at the West Point Foundry for the U. S. Steamer Missouri, without regard to expense, is all finished complete for putting together, and has never been used. Drawings of the cranks can be seen on application to

HENRY THOMPSON & SON,

No. 57 South Gay St., Baltimore, Md.

Sept. 12, 1849.



P. H. Griffin,

Corner of Steuben and James Sts. Albany, N.Y.,
CONTINUES to manufacture copper flues for locomotive boilers, brewers' coppers, stills, tanner heaters, etc. Copper work in general, at the shortest notice. He has constantly on hand brass cocks, brass valves, copper pumps of every variety.

Orders promptly attended to.

1y14

To Railroad Companies.

FOR SALE—A Second-hand Locomotive Engine and Tender, of about 10 tons weight, in good order, and warranted to perform well. Any company wanting a cheap engine for a passenger or light burden train, will rarely meet with an opportunity so favorable as the present. The engine and tender are in perfect running order, and will be tested to the satisfaction of any one wishing to purchase. Price \$1,500.

Address **J. B. MOORHEAD,**

Frazer P.O., Chester county, Pa.

P.S.—The Engine can be seen by calling on H. Osmond & Co., Car-builders, Broad st., Philadelphia.

September 6, 1849.

India-rubber for Railroad Cos.

RUBBER SPRINGS—Bearing and Buffer—Fuller's Patent—Hose from 1 to 12 inches diameter. Suction Hose. Steam Packing—from 1-16 to 2 in. thick. Rubber and Gutta Percha Bands. These articles are all warranted to give satisfaction, made under Tyer & Helm's patent, issued January, 1849.—No lead used in the composition. Will stand much higher heat than that called "Goodyear's," and is in all respects better than any in use. Proprietors of railroads do not be overcharged by pretenders.

HORACE H. DAY,

Warehouse 23 Courtlandt street.

New York, May 21, 1849.

To Railroad Companies and Contractors.

FOR SALE—Two Locomotive Engines and Tenders, at present in use on the Beaver Meadow Railroad, being too light for their coal trains, but well calculated for either gravel or light passenger trains.

They weigh, in running order, about 8 tons each—having one pair of driving wheels 4 feet diameter, 4 truck wheels 30 inches diameter, with cylinders 10 in. diameter, and 18 inches stroke of piston. Tenders on 4 wheels. Address **JAMES ROWLAND,**

Prest. Beaver Meadow Railroad & Coal Co.,

Philadelphia.

or, **L. CHAMBERLAIN,** Sec'y,

at Beaver Meadow, Pa.

May 19, 1849.

20tf

Rosendale Cement.

THE NEWARK AND ROSENDALE LIME AND CEMENT CO. are now manufacturing at their works in NEWARK, N. J., and Ulster county, N.Y., a very superior article of Hydraulic Cement—also Lime Calcine Plaster, etc. Contractors and dealers will find it to their advantage to call or make application before purchasing elsewhere. All communications addressed to the subscriber, at Newark, N.J., will be punctually attended to.

1y15

HENRY WILDE, Secretary.

NORRIS' LOCOMOTIVE WORKS,
SCHENECTADY, N. Y.

THESE Works are in full operation in Manufacturing to order, Locomotive Steam Engines & Tenders, of the best principle and construction of material, using wrought iron heavy frames with pedestals welded thereto, and all parts of the engine made of the best wrought iron, except cylinders, pumps and boxes—obtaining greater durability, and carrying less weight over the road, than engines constructed of cast iron.

Wrought Iron Tires made any required size, and Tire Bars bent and welded with dispatch.
Chilled Wheels for Cars, Trucks and Tenders, made from the toughest iron.

Driving and Tender and Car Wheels fitted to Axles with Brass Boxes and Springs, and Railroad Machinery generally. Manufactured and for sale by
April 11, 1879. E. S. NORRIS.

To the Proprietors of Rolling Mills and Iron Works.

THE Undersigned—Proprietors of Townsend's Furnace and Machine Shop, Albany—are extensively engaged in the manufacture of Machinery and fixtures for Iron, and Copper Rolling Mills, and Iron Works. Having paid particular attention to the manufacture of *Rolls* (Rollers), both *chilled* and *dry-sand*, they feel confident that they can execute orders for such castings in a satisfactory manner. And to give assurance of this, they beg leave to refer to the following named persons, proprietors and managers of some of the most extensive rolling mills in the country, viz: Jno. F. Winslow, J. Tuckerman, H. Burden, W. Burritt, J. & J. Rogers, Saltus & Co., J. B. Bailey, L. G. B. Cannon, Hawkins & Atwater, etc., etc.

F. & T. TOWNSEND.

Albany, August 18, 1849.

Passenger Car Linings.

THE Advertiser continues to make to order the Enamelled Car Linings which have been so highly approved the last three years, and are now exclusively used by all the Northern Railroads. No pains are spared to get out new styles, and adapt them to the tastes of every consumer.

Orders addressed to CHARLES STODDER, No. 75 Kilby street, Boston, will have prompt attention.
March 23, 1850. 2m

CAUTION.

RAILROAD COMPANIES and others are hereby cautioned against using or vending our improvement for easing the lateral motion as applied on Railroad Cars. Letters Patent having been granted to us in 1841, any party or parties so making or using said improvement without license from us will be proceeded against according to law.

DAVENPORT & BRIDGES.

FOWLER M. RAY'S
Patent India-rubber Railroad
CAR SPRING.

New York and Erie Railroad Shops.
Piermont, March 26, 1850.

This will certify that from practical experience in the use of Fowler M. Ray's India rubber Car Springs, I believe them to be far superior to any others now in use.

I have never known them to be affected by any change of temperature, as other Rubber Springs have been affected on this road.

I am at the present time repairing a Passenger Car that Mr. Ray and myself mounted with his springs about two years and eight months since.

The springs are at the present time as perfect, to all appearances, as when first applied to the car.

Respectfully yours,

HORACE B. GARDNER,
Foreman of the Car Shops.

Supt. Office N.Y. & H. R.R., }
New York, March 8, 1850. }

This is to certify that we have used the Rubber Springs manufactured by Mr. F. M. Ray for the past twenty months, "both for Passenger and Freight Car Springs and Bumpers, and of different sizes" and have in every case given entire satisfaction, and I consider them the best spring now in use

M. SLOAT, Supt.

Harlem R.R. Depot, }
New York, March 7, 1850. }

This is to certify that we have used Mr. F. M. Ray's India-rubber Springs for over eighteen months, and find them to be easy and durable, and recommend them to railroad companies as being superior to anything we have tried.

J. M. SMART,
Foreman at 42d St. Depot.

Office New Jersey Railroad Co., }
Jersey City, March 8, 1850. }

FOWLER M. RAY, Esq.,

Dear Sir: In answer to your enquiries respecting the operation of the Vulcanised Rubber Springs, purchased by our company from you some two years since, I reply that they are superior to any spring in use, (that I have either seen or heard of).

The improved form of your spring, consisting of a solid piece of vulcanised rubber with bands on the outside, is far superior to your first form, consisting of disks of rubber with metallic plates interposed.

The last named form was tried, if you recollect, at a much earlier period; and then was replaced by your last form.

I have no hesitation in saying that your springs have given entire satisfaction, and most cheerfully recommend them to railroad companies throughout the country for the following reasons:

- 1st. The cost is 30 per cent. less.
- 2d. Saving of weight on each car of 8 wheels from 700 to 800 lbs.
- 3d. Less care and attention is required, as they are not liable to get out of repair.
- 4th. A great saving is secured in the wear and tear of the cars and rails from their great elasticity.
- 5th. The freedom from noise.
- 6th. There is greater safety in case of accident, as they cannot be broken.
- 7th. The comfort of passengers is enhanced sufficiently to pay the expense, waiving all the other reasons that I have given.

Should this fail to satisfy any person enquiring, you are at liberty to refer to me, No. 150 Washington St., Jersey City. Yours respectfully,

T. L. SMITH, Supt.

New York, March 11, 1850.

I have used the Patent India-rubber Spring purchased of Mr. Ray, upon the cars of the New York and New Haven Railroad, and have found them efficient and economical; and when applied to the axles and draw springs, believe them to be quite equal to any in use. I have found a combination of these springs with a steel spring under the transom beam a very satisfactory arrangement, and am now using this plan in all new cars.

Yours respectfully,
ROBERT SCHUYLER.

February 25, 1850.

From practical observation of the use of the India-rubber Car Springs, manufactured and sold by your company, we are entirely satisfied in their application, and do not hesitate to recommend them as elastic, durable, requiring no repairs for years, and retaining their consistency during all extremes of weather. We have applied them for the past two years, and consider them superior for all railroad purposes.

Yours truly,

OSGOOD BRADLEY, Car Builder, Worcester.
T. & C. WASON, do. Springfield.
DEAN, PACKARD & MILLS, do. do.
DAVENPORT & BRIDGES, do. Cambridgeport.

Office of the New Jersey Railroad Co., }
Jersey City, March 7, 1850. }

This is to certify that we have had Mr. F. M. Ray's India-rubber Springs in constant use under our cars, and as Bumper Springs for upwards of two years, and they have in every way given perfect satisfaction.

The present form of spring we deem far superior to the form of Disk, having used both forms, although we have none of those made in Disks at present in use.

We take pleasure in recommending these springs to all railroad companies.

J. P. JACKSON, Vice Prest.
New Jersey Railroad and Trans. Co.

Roxbury, February 28, 1850.

In compliance with your request, I take great pleasure in stating the result of my experience in the use of "Ray's Patented Vulcanised India-rubber Car and Engine Springs." We have used them nearly two years, and never had one fail in any way. The cold weather does not affect them, as it has other rubber springs we have used.

With sixteen years' experience as superintendent of machinery on the Boston and Providence railroad, I take pleasure in saying that your springs are the best we ever used, or I ever saw used elsewhere. We have 20 cars rigged with them, of which I can say that the springs are as good now as when first applied. I put 24 lbs. of the rubber under the forward end of one of our heaviest engines, taking off 250 lbs. of steel springs—it has been in use 18 months, and is in as good condition now as when first put under the engine.

Very respectfully yours,

GEO. S. GRIGGS,

Supt. of Machinery, Boston and Prov. R.R.

Fall River, February 2, 1850.

In answer to yours of the 20th ult. I would say that this company has for some 10 or 12 months past been using "Ray's India-rubber Springs." We have applied them to both passenger and freight cars with uniform success. They have invariably preserved their elasticity and consistency through all the extremes of weather; and we are now applying them whenever the steel spring fails. I am well satisfied that they are particularly adapted for railroad purposes.

Very respectfully yours,

GEO. HAVEN,
Supt. Fall River Railroad.

Jersey City, March 9, 1850.

This is to certify that the present form of Mr. F. M. Ray's India-rubber Car Spring I consider far superior to the form of Disk, having used both forms.

I take pleasure in recommending these springs to all railroad companies.
DAVID H. BAKER,
Foreman of Car Shop of N.J. R.R. & Trans. Co.

Boston, March 5, 1850.

In answer to your enquiry about India-rubber Springs, I have to say that we have used them to a considerable extent on both freight and passenger cars, and also on several of our tenders; and I am very well satisfied that they answer all the purposes for which they are intended. I believe the India-rubber will soon supersede all other springs for cars and tenders.

Yours truly,

S. M. FELTON,
Supt. Fitchburg Railroad.

Old Colony Railroad Office,
Boston, March 6, 1850.

EDWARD CRANE, Esq.,

President New England Car Co.,

Dear Sir: In compliance with your request I would state that the Old Colony Railroad Company have had in use upon their road, India-rubber Springs furnished by your company, for more than eighteen months past, during which time they have been extensively used under Passenger and Freight Cars, Locomotive Tenders, and for Drawer and Buffing Springs, with the most perfect success. The elasticity and consistency of the Rubber has never been unfavorably affected by either extremes of heat or cold—and from the experience which we have had in the use of Rubber Springs, I think them well adapted for railroad purposes—and therefore we have for some months past used Rubber almost exclusively, in all places where springs are required.

Respectfully yours, etc.,

JAS. H. MOORE,
Supt. O. C. Road.

Troy, February 27, 1850.

We have been using your India-rubber Car Springs for nearly two years—and we take pleasure in saying that in our opinion the rubber has to a certain extent already, and may eventually entirely supersede all other Springs for Railroad Car purposes. We now use it entirely for Draw Springs and Bumpers, considering it better and lighter than steel.

During our two years' experience in the use of it, we have not known any to lose their elasticity, or fail in any way; and we cheerfully recommend the rubber for railroad car springs. Very respectfully,

EATON, GILBERT & CO.

To Practical Machinists.

AN excellent opportunity now occurs to a practical Machinist, of WELL ESTABLISHED REPUTATION, and some capital, to engage extensively in the STEAM ENGINE, BOILER and FOUNDRY BUSINESS.

An establishment is now ready for business, ample in all its details, including extensive wharf room, for any sized steamboats, and from its position, if properly conducted, will doubtless command a large share of business.

A practical Machinist, as a partner is required, to conduct the whole establishment: and only those FULLY COMPETENT need apply. Address (post paid) "MACHINE CO.," Box No. 741, Philadelphia, Pa. 1m14

Etna Safety Fuse.

THIS superior article for igniting the charge in wet or dry blasting, made with DUPONT'S best powder, is kept for sale at the office and depot of

REYNOLDS & BROTHER,

Sole Manufacturers, No. 85 Liberty St.

NEW YORK.

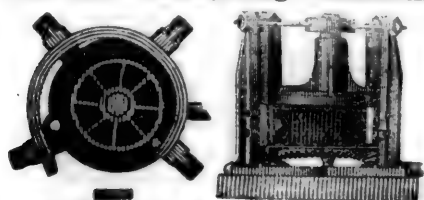
And in the principal cities and towns in the U. States. The Premium of the AMERICAN INSTITUTE was awarded to the Etna Safety Fuse at the late Fair held in this city.

November 3, 1849.

ly

MACHINERY.

Henry Burden's Patent Revolving Shingling Machine.



THE Subscriber having recently purchased the right of this machine for the United States, now offers to make transfers of the right to run said machine, or sell to those who may be desirous to purchase the right for one or more of the States.

This machine is now in successful operation in ten or twelve iron works in and about the vicinity of Pittsburgh, also at Phoenixville and Reading, Pa., Covington Iron Works, Md., Troy Rolling Mills, and Troy Iron and Nail Factory, Troy, N. Y., where it has given universal satisfaction.

Its advantages over the ordinary Forge Hammer are numerous: considerable saving in first cost; saving in power; the entire saving of shingler's, or hammerman's wages, as no attendance whatever is necessary, it being entirely self-acting; saving in time from the quantity of work done, as one machine is capable of working the iron from sixty puddling furnaces; saving of waste, as nothing but the scoria is thrown off, and that most effectually; saving of staffs, as none are used or required. The time required to furnish a bloom being only about six seconds, the scoria has no time to set, consequently is got rid of much easier than when allowed to congeal as under the hammer. The iron being discharged from the machine so hot, rolls better and is much easier on the rollers and machinery. The bars roll sounder, and are much better finished. The subscriber feels confident that persons who will examine for themselves the machinery in operation, will find it possesses more advantages than have been enumerated. For further particulars address the subscriber at Troy, N. Y. P. A. BURDEN.

Railroad Spikes and Wrought Iron Fastenings.

THE TROY IRON AND NAIL FACTORY, exclusive owner of all Henry Burden's Patented Machinery for making Spikes, have facilities for manufacturing large quantities upon short notice, and of a quality unsurpassed.

Wrought Iron Chairs, Clamps, Keys and Bolts for Railroad fastenings, also made to order. A full assortment of Ship and Boat Spikes always on hand.

All orders addressed to the Agent at the Factory will receive immediate attention.

P. A. BURDEN, Agent,
Troy Iron and Nail Factory, Troy, N. Y.

RAILROAD WHEELS.

CHILLED RAILROAD WHEELS.—THE UNDERSIGNED are now prepared to manufacture their Improved Corrugated Car Wheels, or Wheels with any form of spokes or discs, by a new process which prevents all strain on the metal, such as is produced in all other chilled wheels, by the manner of casting and cooling. By this new method of manufacture, the hubs of all kinds of wheels may be made whole—that is, without dividing them into sections—thus rendering the expense of banding unnecessary; and the wheels subjected to this process will be much stronger than those of the same size and weight, when made in the ordinary way.

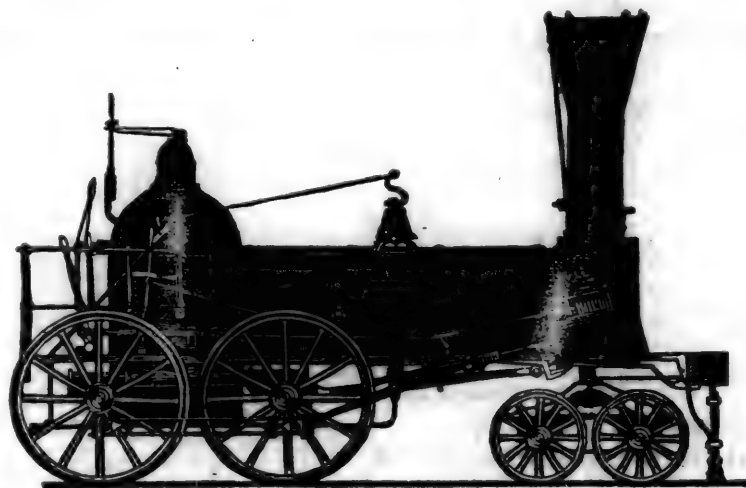
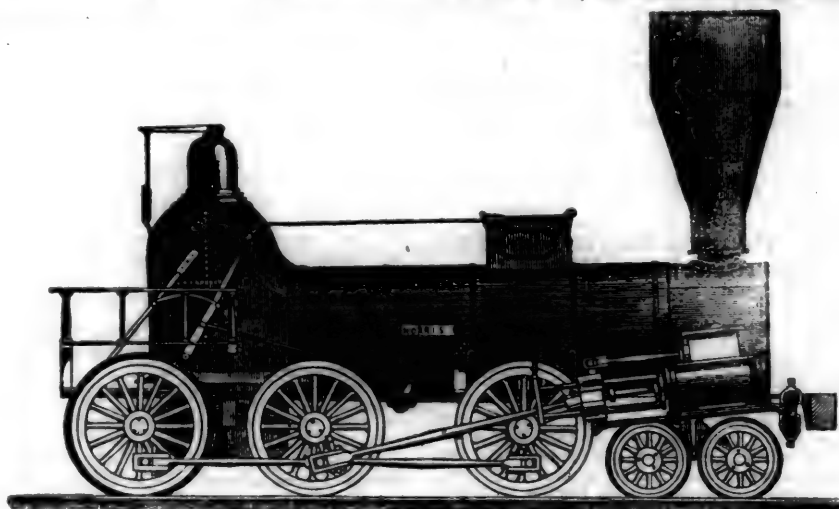
A. WHITNEY & SON,
Willow St., below 13th,
Philadelphia, Pa.

CHILLED RAILROAD WHEELS.—THE UNDERSIGNED, the Original Inventor of the Plate Wheel with solid hub, is prepared to execute all orders for the same, promptly and faithfully, and solicits a share of the patronage for those kind of wheels which are now so much preferred, and which he originally produced after a large expenditure of time and money.

A. TIERS,
Point Pleasant Foundry.

He also offers to furnish Rolling Mill Castings, and other Mill Gearing, with promptness, having, he believes, the largest stock of such patterns to be found in the country.

Kensington, Philadelphia Co., }
March 12, 1848. }

NORRIS' LOCOMOTIVE WORKS.
BUSHHILL, SCHUYLKILL SIXTH-ST., PHILADELPHIA,

THE UNDERSIGNED Manufacture to order Locomotive Steam Engines of any plan or size. Their shops being enlarged, and their arrangements considerably extended to facilitate the speedy execution of work in this branch, they can offer to Railway Companies unusual advantages for prompt delivery of Machinery of superior workmanship and finish.

Connected with the Locomotive business, they are also prepared to furnish, at short notice, Chilled Wheels for Cars of superior quality.

Wrought Iron Tyres made of any required size—the exact diameter of the Wheel Centre, being given, the Tyres are made to fit on same without the necessity of turning out inside.

Iron and Brass castings, Axles, etc., fitted up complete with Trucks or otherwise.

NORRIS, BROTHERS

LAWRENCE'S ROSENDALE HYDRAULIC Cement. This Cement is warranted equal to any manufactured in this country, and has been pronounced superior to Francis' "Roman." Its value for Aqueducts, Locks, Bridges, Floors, and all Masonry exposed to dampness, is well known, as it sets immediately under water, and increases in solidity for years. For sale in lots to suit purchasers, in tight papered barrels, by

JOHN W. LAWRENCE,
142 Front-street, New York.

Orders for the above will be received and promptly attended to at this office. 32 ly.

PATENT MACHINE MADE HORSE-SHOES.

The Troy Iron and Nail Factory have always on hand a general assortment of Horse Shoes, made from Refined American Iron.

Four sizes being made, it will be well for those ordering to remember that the size of the shoe increases as the numbers—No. 1 being the smallest.



P. A. BURDEN, Agent,
Troy Iron and Nail Factory, Troy, N. Y.

COLUMBUS, OHIO,
Railroad Car Manufactory.
RIDGWAYS & KIMBALL,

HAVE established at this central point, the manufacture of Passenger, Freight, Gravel and Hand Cars for Railroads, and assure all Western Railroad Companies that it will be their constant aim to procure the best materials and workmen, and to turn out the best kind of work at fair prices. Specimens may be seen on the Columbus and Xenia Railroad. The patronage of Railroad Companies is respectfully solicited. 1y8

To Inventors and Patentees.

OWEN G. WARREN, ARCHITECT, Has had many years' experience as Agent for obtaining Patents, both in this country and Europe, and will transact such business promptly and reasonably. Persons at a distance can have their business done by correspondence—without the necessity of visiting this city or Washington. Office No. 94 Merchants Exchange, Wall st., corner of Hanover st., up stairs. 1y3

AMERICAN RAILROAD JOURNAL.

STEAM NAVIGATION, COMMERCE, MINING, MANUFACTURES.

HENRY V. POOR, Editor.

ESTABLISHED 1831.

PUBLISHED WEEKLY, AT No. 136 NASSAU ST., NEW YORK, AT FIVE DOLLARS PER ANNUM IN ADVANCE.
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ASSISTANT EDITORS,

J. T. HODGE, *For Mining and Metallurgy.*
GEN. CHAS. T. JAMES, *For Manufactures and the
Mechanic Arts.*
M. BUTT HEWSON, C. E., *For Civil Engineering.*

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American Railroad Journal.

PUBLISHED BY J. H. SCHULTZ & CO., 136 NASSAU ST.

Saturday, May 25, 1850.

From the Ohio State Journal.

Central Ohio Railroad.

The pains which have been taken to manufacture public opinion in favor of other contemplated lines of railway, running east and west through Ohio, and especially some recent efforts to disparage the value, to Central, Western, and South-western Ohio, of the central Ohio line, will I trust be an apology for troubling you with some facts which if they do no good at present, may possibly be worth referring to hereafter.

While these several enterprises are yet in the gristle, and before any great expenditures are made upon them, it is important for the people of Ohio to survey the whole ground deliberately, choose carefully, and then drive to the goal energetically.

What are the elements that should be present to give assurance of success to railway projects in Ohio? *Geographical position—directness of line—economy of construction—control of local, as well as through traffic, and location and the public works away from the competition of navigable waters.*

In all these various elements I shall endeavor to prove that the Central Ohio line is not equalled by any in Ohio, and that there is none so deserving of the confidence and aid of the region it penetrates and is intended to benefit.

And in weighing properly the value of this line, I shall feel at liberty to introduce, as part of its capabilities, other lines, either built or projected—or which, from the topography and geographical relations of the country, will sooner or later be impelled into existence—and all of which must become tributaries to the "GREAT CENTRAL LINE," as it is emphatically called by the Baltimore company.

The charter for the Central Ohio railroad company was obtained in 1847. It was projected as the legitimate extension of the Baltimore and Ohio railroad west of the Ohio river, and as the medium of railway connexion between that road and the table lands of Central Ohio and Indiana. To accomplish this object, powers were conferred, extending from the Indiana state line, through Columbus, Newark, and Zanesville, to such point on the Ohio river as the directors may select.

The Baltimore company contemplates penetrating the valley of the Ohio by the ravine of either Fish or Grave creek, and thence run up the river to their legal terminus at the city of Wheeling.—That city wishes to compel the Company to adopt the Grave creek route, which strikes the Ohio valley eleven miles nearer Wheeling than Fish creek. The charter of the Central Ohio company, and the topography of the country admit of an advantageous junction with the Baltimore road at Wheeling, at Grave creek, or Fish creek, if the construction which may be placed upon the Virginia charter will admit of a junction by any road, with the Baltimore road, at any other point than Wheeling.

To accomplish a connection with the Baltimore road, three other Ohio lines were projected and companies chartered, viz: the "Cincinnati and Belpre," the "Franklin and Washington," and the "Central Valley." The two first were chartered when the Baltimore company was expected to strike the Ohio at Marietta or Parkersburgh. As the powers of the Franklin and Washington charter are suspended, by consent of the company, and will probably never be exercised, if the Central Ohio road be built, public attention is naturally directed toward the "Central Valley" and the "Cincinnati and Belpre" routes, as the rivals of the Central Ohio line with reference to a Baltimore connexion.

There are two other lines running east and west through Ohio, the respective friends of which have placed themselves as rivals to the Central line; but I think they have done so without reason. One of them—the Steubenville line—if built, may become an important auxiliary, and not a rival. The other—the Ohio and Pennsylvania line—will, as far west as Mansfield, have enough of its own legitimate traffic to support it, without being obliged to step out of the way, in a struggle for a traffic from Central, Western, and South-western Ohio which it can never obtain except at ruinous sacri-

fices. The ungenerous effort of that company to hold back enterprises not in conflict with it, smacks very much of Pennsylvania policy.

Central Valley Route.

The route contemplated by the "Central Valley" charter starts from the "Central Ohio" line at Newark, passing through Coshocton and Cadiz, and reaching Wheeling at a distance of 127½ miles.—From the topography of the country intervening, and from the necessary dictates of economy, the actual point of divergence from the Central Ohio line will be 13 miles east of Newark, using, from Columbus to that point, 46½ miles of the Central Ohio road. From the point of divergence to Urichsville, a distance of 60 miles, the Valley route would run in the immediate neighborhood of the Ohio canal, and for the local trade of all that region, especially in heavy articles, it would be obliged to struggle with the competition of canal transportation. From Urichsville to Cadiz, if I am correctly informed, there is but little promise of way traffic. From Cadiz to the Ohio river, a distance of about 20 miles the country is more favorable.

Now when it is borne in mind that, with few exceptions, two-thirds of the entire profits of railways in the United States result from way traffic—and that this is more particularly the case with western railways—we see the importance of a location that shall control such traffic.

In this respect, how is the Central Valley route? Obviously unfavorable. Throwing off 20 miles east of Cadiz and 13 miles in the Central Ohio line, and there would be 94½ miles, or about three-fourths of the whole, which having but a limited local traffic, would be obliged to look for through traffic to support it. Where could that be obtained? By diverting it from the Central Ohio road? We shall see.

In the following table of comparative distances, we place three points of junction with the Baltimore road as being within the option of the Central Ohio company, and from which that company may compel the Central Valley line to rate its capabilities of competition:

Distances by Central Valley route:

From Newark to Wheeling, 127½ miles; to Grave creek, 139½ miles; to Fish creek, 150½ miles.

By Central Ohio line:

From Newark to Wheeling, 115½ miles; to Grave creek, 100 miles; to Fish creek 100 miles.

Differences in favor of the Central Ohio railroad:

From Newark to Wheeling, 12½ miles; to Grave creek, 39½ miles; to Fish creek, 50½ miles.

As (every thing else being equal) a long line cannot compete with a short one in the transaction of through business, and as this disparity is still more decided where the long line has but a limited local traffic, and the short line traffic at every step, we think it useless to continue the comparison. If, however, the spirited friends of the projected line through Steubenville should be able to force a di-

rect connexion with Pittsburgh. the union of the Steubenville interest with the equally spirited advocates of the Cadiz route might build a road from Ulrichsville down to the junction with the Central Ohio road; and this combination line, without diverting any *through* traffic from the Central road, would become a very important auxiliary to its business west of the junction.

Cincinnati and Belpre Route.

The Cincinnati and Belpre charter being short in line, a law was applied for, and allowed by the last Legislature, to extend its powers so as to reach the Baltimore road.

This Belpre route would lead the south western traffic from Cincinnati to the Baltimore road over the following distances:

To Hillsboro'	60
To Chillicothe	40
To Marietta	105
To Fish Creek	58
	263

In all probability the Baltimore company will be compelled to enter the immediate valley of the Ohio river at Grave creek, which is eleven miles further up than Fish creek, making the whole distance between Cincinnati and the Baltimore connexion 274 miles.

The traffic could reach the same points over the Little Miami and Columbus and Xenia railroads [already built, as against a corresponding distance on the rival line to be built] and the line of the Central Ohio railroad in the following distances from Cincinnati, viz:

To Columbus	119
To Zanesville	59½
To Fish or Grave creeks	77

255½ miles

Making a difference in favor of the Central Ohio line of 7½ miles to Fish creek and 18½ miles to Grave creek!

Should the full capabilities of the country be claimed, without regard to the lines at present chartered, I beg to suggest a route, that by natural indications, is the shortest and best, of which Cincinnati, struggling to make the Baltimore connexion, can possibly avail herself—a route traversing a region of unsurpassed agricultural capabilities, and rich already in the possession of an industrious and intelligent population—I mean the route thro' Circleville. Distance as follows, viz:

By Little Miami railroad to Morrow... 40

To Circleville	66
To Lancaster	20
To Zanesville	36
To Fish or Grave creeks	77

239 miles.

Making by this route to Grave creek a difference of 35 miles against the Belpre line! The value to Cincinnati of this route (and the danger to Columbus) can only properly be appreciated by the startling consideration that it will furnish to the former city a railway connexion with Pittsburgh and the great Central Pennsylvania line thirty miles shorter than any line projected north of it, and fifty-five miles shorter than the route by the Cleveland road to the junction with the Ohio and Pennsylvania line, the only one likely to be built! The connection referred to would be over a projected line from Wheeling to Pittsburgh, for which a clear charter is already obtained, and three practicable routes, (none exceeding 63 miles) are ascertained to exist. Distances on the respective routes between Cincinnati and Pittsburgh, as follows:

By Mt. Vernon—	
To Columbus	119 miles.
To Loudonville by Mt. Vernon	70
Pittsburg	155

344 miles.

By Cleveland road and Mansfield—	
To Columbus	119 miles.
To Galion	70
To Pittsburgh	180

369 miles.

By Circleville—	
To Zanesville	162 miles.
To Wheeling	90
To Pittsburgh	62

314 miles.

When it is considered that the Circleville route to the Central Ohio line, and thence with that line, is the *shortest* practicable route between Cincinnati and both the Baltimore and Philadelphia roads, and one of them giving the *shortest practicable* line of travel to New York and Boston, I should look upon its adoption as conclusive now and forever, against the Belpre route, and as ominous to Columbus.

But to return to a comparison between the Central and the Belpre lines. To account for the Belpre line being a favorite with Cincinnati against a shorter line, we would naturally expect that it is superior to its shorter rival in other essentials.—Has it more favorable grades? No. Can it be more cheaply constructed? Not so cheaply. Is it far from the competition of canals or navigable waters? The line would have to be located for not less than 70, perhaps 81 miles along the banks of the Ohio river—probably the cheapest steam navigation in the world. Well then, has it not a decided superiority over the short line in the control of local traffic? The following table of the taxable property in the several counties along the respective lines, extracted from the last Report of the State Auditor, will answer that question, for property is usually a fair index of traffic.

Taking our divergence for both lines from the Little Miami railroad, we find the counties arranged as follows:

Belpre Line.

Clermont	\$6,534,215
Brown	5,363,762
Highland	5,553,814
Ross	10,247,961
Jackson	1,520,397
Athens	2,286,636
Washington	3,919,246
Monroe	2,572,393

\$37,998,424

Circleville and Central Ohio Line.

Warren	\$8,091,250
Clinton	4,467,533
Fayette	3,140,893
Pickaway	7,869,061
Fairfield	7,490,984
Perry	3,570,609
Muskingum	10,816,029
Guernsey	4,905,720
Belmont	7,248,624

\$57,600,703

Making a difference in the property list upon the two lines of nearly twenty millions of dollars, or 50 per cent. in favor of the short line! As however this argument is not intended to weigh against the value of a railroad from Cincinnati to Chillicothe (for so far a railway will be justified, and perhaps also in Jackson county, for the sake of iron and coal) a more just comparison would be made by taking the counties east of the Scioto river, on the respective lines. This would make a still more marked difference as follows:

Belpre Line.

Half of Ross	\$5,122,980
Jackson	1,520,397
Athens	2,286,636
Washington	3,919,246
Monroe	2,572,393

\$15,422,652

Circleville and Central Ohio Railroad.

Half of Pickaway	\$3,924,530
Fairfield	7,496,984
Perry	3,570,609
Muskingum	10,816,029
Guernsey	4,905,720
Belmont	7,248,624

\$37,956,496

Making a difference in favor of the short line of more than twenty two millions of dollars, or upwards of 150 per cent. But worse yet—nearly one

half of the Belpre line east of Chillicothe passes along the banks of the Ohio river, and for about three-fourths of the year the country, preferring the cheaper transportation of the river, would furnish to the railway no traffic at all!

I hope the friends of the Belpre route are satisfied.

So far as Columbus and Central Ohio are concerned in obtaining a connection with the Pennsylvania Central railway, I beg to submit the following comparison of distances between the Ohio and Pennsylvania and the Central Ohio lines, from Columbus to Pittsburgh.

Ohio and Pennsylvania Line.

By Cleveland road to Galion	70 miles.
To Pittsburgh	180

250 miles.

By Mt. Vernon (if ever built) to Loudonville	70 miles.
To Pittsburgh	155

225 miles.

Central Ohio Line.

To Zanesville	59½ miles.
To Wheeling	90
To Pittsburgh	62

211½ miles.

Making a difference in favor of the Central line of 13½ miles, even if the Mt. Vernon link should ever be made (which is not likely to be done, as the wants of the country do not demand it) and 38½ miles if the Cleveland road to Galion be the route to reach the Ohio and Pennsylvania road.

I trust I have said enough to prove that the Central Ohio railroad, when built, will furnish either in part, or over its entire length, the most desirable commercial outlet for Central, Western and South Western Ohio, and for the larger portion of the vast traffic which, between the Atlantic and the great West and South West, is destined forever to traverse the iron highways of our noble State.

Z.

Zanesville, May, 1850.

[Foreign Correspondence of the Railroad Journal.]

French Railways.

Paris, April 8, 1850.

The railroad from St. Etienne to Lyons, after that from St. Etienne to Loire, was the first established in France. The law authorising its construction was passed in June, 1826, the work was immediately commenced upon it, and its completion secured in about two years after. The object of constructing this road was to bring into market the mineral wealth of the region about St. Etienne, and this object has been realized to a degree far surpassing expectation. The cars upon this and the Loire road were at first drawn by horses or rude engines, such as had then been in use in the coal districts of England for many years. As improvements have been made from time to time in the motive power on railways, they have been introduced upon these roads, and yet the increased capabilities thus produced have hardly kept pace with the constantly augmenting business upon them. In 1848, there was in the single article of coal 700,000 tons transported over them, and the amount has probably been increased to 1,000,000 for the past year.

No railways for the transport of passengers were undertaken in France till after the opening of the Liverpool and Manchester railway had demonstrated the wonderful capabilities of this agency, not only for carrying passengers, but for every species of transportation. To M. Emile Periere is due the honor of having first called the attention of the French government to the subject. His efforts resulted in the authorization of the road from Paris to St. Germain July 1835. It was completed and opened for travel in August 1837. The success of

this undertaking forced the government to give some attention to the subject of railways, and the same year a commission was appointed to prepare the project of a law for a general system of railways, to be submitted at the ensuing session of the Chambers. A report was accordingly presented, in which the committee, upon urging with great force the importance of railways, proposed that the principal lines should be constructed and managed by the State, while those of secondary importance might be conceded to private companies. Upon the question of adopting this project, a contest ensued in which the party that had usually acted with the government opposed the measure, while the opposition party united with the government in the hope of carrying it.

The measure was now however defeated, and with its defeat, ended all efforts of the government to construct railroads for the next four years.—Meantime, private companies offered to construct roads upon their own resources, and in June of the same year after the defeat of the government measure in May, a company with a capital of 40,000,000 francs was authorised to construct the line from Paris to Orleans. This was regarded as one of the most important lines in the country, and had been placed first upon the list in the government project, just defeated.

We next find Lafitte, Blount & Co., in 1840, authorised to construct the line from Paris to Rouen, with a capital of 36,000,000 francs. The work was commenced in 1841, and by the aid of 3 loans from government, amounting in all to 23,000,000 francs, it was completed in 1843.

In 1843, the government, through its Minister of Public Works, M. Teste, presented to the Chamber of Deputies a plan for constructing a system of railways. It was proposed that the roads should be constructed by the government and companies acting together. The government was to purchase the lands, buildings and other property necessary to their construction, two-thirds of this expense to be paid by the departments through which the road passes, and the other one-third by the State. Companies were to grade and equip the roads, and to have leases from the government for working them, and appropriating the profits to themselves for a certain number of years, say 30, 50 or 99 years, as the case may be. At the expiration of the leases, unless renewed, the government was to pay to the companies the appraised value of their property, and take to itself the control and working of the roads.

This system contemplated the construction of six trunk lines, having Paris for a common centre.—The 1st, issuing from Paris in the direction of the Belgium frontier—the 2d, to one of the ports in the channel to connect with England—the 3d, to the ocean by a western port—the 4th, passing through the centre of France to the Spanish frontier—the 5th to the Mediterranean at Marseilles, and the 6th towards the Rhine by Strasbourg. This measure in its length and breadth was adopted by the Chambers, and became law, forming apparently the most auspicious period in the history of French railways. Maps published about this time spread out in lively colors this grand and well arranged plan, unfortunately not soon to be completed. The maps of 1850 showing the railways completed and in progress bear no traces of several of these lines. The whole scheme proved an utter failure. In the first place companies were unwilling to accept the terms prescribed, and in the next place the depart-

ments were at the time so heavily taxed, that they were far from seeking additional burdens, and the law, though unrepealed, has remained a complete dead letter. Not a single road has ever been constructed under it.

Most of the roads now completed have been made by companies, aided by the government. Some few have been built by government. The charters of the companies are not perpetual, but limited to a certain number of years. The leases, as they are called, were at first granted for 99 years, but more recently some have been restricted to 39 and 45 years. There are now 24 roads in France either completed or in process of construction, upon 1722 miles of which the cars now run, and the aggregate length of the whole when completed will be 2996 miles. The most important of French railways is that of the north, one branch of which strikes the channel at Boulogne, another Calais, and a third Belgian frontier at Valenciennes. It is 321 miles in length. The road to Havre and Dieppe is also an important one. A large portion of the trade between the United States and France passes over it to reach the packets for New York. There is very little that is peculiar in the French roads.—They are very substantially built on the narrow gauge (4 ft., 8½ in.) with double track. Most of the rails, particularly, upon the roads last completed, are the U or bridge pattern, and are invariably laid upon the transverse sleeper. I have with much difficulty succeeded in getting data which may be regarded tolerably accurate, showing the cost of 17 roads 1,294½ miles in aggregate length, and which as will appear by the subjoined table, involved a total expenditure of \$155,748,175. The average cost per mile is \$128,240.

The passenger cars are similar to those of Germany, which I have before described, and upon some of the roads they are superior in style of finish to those upon any other roads in Europe. The merchandise cars are very similar to our own.—Everything upon the French railways is done with system. The greatest order and regularity prevail in every department. The employees of the roads are the most polite and gentlemanly to be found anywhere. The tickets are printed upon common colored paper, and upon the back contain the names of all the stations in the distance for which you have paid. A stranger finds this quite a convenience.

There is attached to each train a car appropriated to the transport of dogs, a thing peculiar I think to France. Dogs are not allowed in the cars with their masters or mistresses, and as almost every body here has a dog, this car is absolutely necessary. The fare for a dog is usually one-third to one-half that for a third class passenger.

The atmospheric railway from Vesinet to St. Germain is perhaps the best of the kind in the world, and worthy a word of remark. This species of railway was adopted to overcome the rapid ascent from Vesinet to St. Germain instead of employing a stationary engine. The distance is 11.5 miles, and the average ascent a little more than 1 ft. in 38 ft.

The machinery is worked by two powerful engines, which are placed near the summit of the ascent, one of which is sufficient for raising ordinary rains. When the trains arrive at Vesinet, the engine is detached and notice given by telegraph that all is ready. The piston which is attached to the former car being placed in a cast iron tube 16 inches in diameter, the engines exhaust their air

at the other end. Immediately the cars begin to move and the whole distance is passed in 3 minutes. In nearly 3 years that this road has been in operation, not the slightest accident has occurred. It may be worthy of consideration whether this mode of gaining elevation is not preferable to the usual stationary engine and ropes. The trains descend the plane by the force of gravity regulated only by the valve.

It can hardly be said at present that the prospect for further construction of railways in France is encouraging. The uncertainty which all seem to feel in reference to the future of France will pretty effectually prevent capitalists from embarking in these, or indeed in any enterprises. France is in a transition state—too much liberalized for a monarchy, not sufficiently enlightened for real republicanism, she enjoys the stability and prosperity of neither. She is now divided into factions, the leaders of which think far more of their own selfish ends than of their country's good, while the great masses wish for freedom, without knowing how to obtain it. I am not one of those who think France is to retrograde and finally sink to monarchy or despotism, but I am by no means sure that she is very soon to become thoroughly republican. It so much depends upon the men whom the people select to represent them, that if they chance to be in future as unfortunate as they have thus far been, the time is distant when we may expect to see the republic thoroughly and permanently established. It will not be till the people find among themselves men of sufficient ability to direct affairs and counteract the intrigues of their enemies. Most of those who have heretofore gained the suffrages of the people have proved false to the most solemn pledges made before election. They would blot out even the name of republic if they dared do it, and yet were elected with the most solemn protestations of devotion to it in their mouths. It is not difficult to see that while such treachery and want of confidence exist, little advance can be made in national prosperity. Capital as fast as accumulated will be invested where it will not be subject to so many contingencies. It will most likely go out of the country.

The Paris and Lyons road, portions of which are now in operation, and other parts partially built, has lately been given up by the government to companies, and its early completion we may hope is thus secured. After the immense sums expended by the State upon it, it would seem that companies might make a profitable business upon the terms granted. Beside this there is no other line of importance upon which there is a chance of much being done this season.

In the table below I have given the fares for the three classes of passengers upon 21 roads of 1498.5 miles in length, and I make the average for those of the first class 3.07 cts. per mile; the second class 2.31 cts. per mile, and the third class 1.77 cts. per mile.

I have also given the time of the direct or express trains upon such roads as run them, including the necessary stoppages. The average speed of these trains is 29 miles per hour. For the ordinary passenger trains I have taken the average of four trains for each road, and the general average proves to be 19 miles per hour, including stoppages. By reckoning the time in this manner, a very good idea is given of the speed which trains make in their ordinary business, and which I think will be found very little if any to exceed that of trains upon our roads of a single track. J. M. A.

	Length. miles.	Whole cost.	Cost per mile.	FARES.		TIME OF		Ordinary trains.	Express trains.
				1st class.	2d.	3d.	h.m.		
Amiens to Boulogne.....	77	\$7,562,809	\$96,919	\$2 38	\$1 79	\$1 38	3 17	2 25	
Andrezieux to Roanne.....	42-2	3,347,256	79,319	1 92	0 93	0 93	3 12	....
Avignon to Marseilles.....	74-5	14,007,884	188,020	2 53	1 76	1 18	3 57	3 02	
Centre Orleans to Bourges and Chateauroux.....	142	16,813,250	178,403	3 98	3 05	2 26	6 32	5 15	
North Paris to St. Quentin, Val- enciennes and Calais.....	321	34,928,324	108,811	7 47	5 63	3 14	15 34	10 40	
Paris to Orleans.....	75-8	11,251,683	148,439	2 34	1 76	1 31	4 00	3 15	
Orleans to Tours.....	70-8	8,468,199	119,607	2 10	1 66	1 22	3 55	....
Paris to Rouen.....	85	12,985,129	152,766	2 97	2 41	1 86	4 15	3 45	
Paris to St Germain.....	13	4,822,280	370,944	2 79	2 32	2 32	0 35	0 30	
Paris to Sceaux.....	7	837,000	119,571	0 18	0 16	0 11	0 25	....
Paris to Versailles (right bank).....	11-8	3,582,848	303,631	0 27	0 23	0 23	0 36	....
" " (left bank).....	10-5	3,343,626	318,440	0 37	0 27	0 23	0 31	....
Rouen to Havre.....	55-3	11,251,883	203,479	1 86	1 39	0 93	3 08	2 25	
Strasbourg to Bale.....	87-6	8,656,514	98,818	3 13	2 73	2 03	5 11	4 34	
St. Etienne to Lyons.....	36	4,597,351	127,704	0 46	0 46	0 46	3 05	2 55	
Tours to Angers.....	67	6,532,633	97,502	2 07	1 56	1 16	3 40	3 00	
Rouen to Dieppe.....	38	2,760,296	72,656	1 20	0 90	0 67	2 32	2 15	
Mulhouse to Thann.....	13	.....	.....	0 40	0 31	0 23	0 41	....
Versailles to Chartres.....	44	.....	.....	1 30	0 97	0 74	2 14	....
Paris and Lyons—Paris to Ton- nere, Dizon to Chalons.....	165	.....	.....	5 00	3 84	2 85	8 28	6 23	
Montereau to Froyes.....	62	.....	.....	1 91	1 43	1 06	3 37	2 58	

Total number of miles.....	1,498-5
Total cost.....	\$155,748,175
Average cost per mile.....	\$128,240
Average fair per mile for 1st class passengers.....	3-07 cts.
" " " 2d class passengers.....	2-31 cts.
" " " 3d class passengers.....	1-77 cts.
Average speed of ordinary passenger trains—miles per hour.....	19
" " direct or express trains—miles per hour.....	29

REMINISCENCES OF THE NORTH RIVER—TRAVELLING, STEAMBOATS, &c.

In the year 1800, merchants residing a hundred miles or more from New York, and distant from the North river ten or fifteen miles, sent their bed and bedding to the landing from which they were to sail for the city, by a team, and themselves followed on horseback. At the landing, their bed, &c. was placed on board the sloop that conveyed their produce to market, and by it they took passage for the city. The horse was put to pasture or in the stable until their return, when the owner rode him home; and by the team that went for the merchandise the bed and bedding were returned. Such was the convenience of travelling at that day.

In November, 1806, five gentlemen associated themselves together for the purpose "of rendering the passage between Hudson and New York by water more expeditions, convenient, and pleasant to ladies and gentlemen travelling north and south through the state of New York, as well as to promote the interest of those concerned," (as expressed in the words of the agreement,) by building a packet of one hundred and ten tons burden, for the purpose of carrying passengers only. To accomplish this object, they bound themselves to each other to furnish the sum of six thousand dollars.—In accordance with this agreement, the superior packet sloop Experiment was built, and superbly fitted up with state rooms and berths, her whole length below decks, for the accommodation of passengers, and performed the passage between New York and Hudson in an unprecedented short space of time.

In January, 1807, some new names were added to the original subscribers, and a further agreement entered into to build another packet of the same class and for like purposes, to accomplish which the subscriptions were increased to twelve thousand dollars. This packet, like the first, was fitted up in style, and placed with the other on the North river; and at the time the two created quite an excitement. We have before us a bill and receipt for a passage on board one of these vessels 40 years ago. It is somewhat formal, and we give it at length as a curiosity, as it shows the manner in which things were done on the North river at that day. The passage referred to was performed in 27 hours:—

Sloop Experiment, Laban Paddock, master, for the accommodation of passengers on the North river, will sail from Hudson every Wednes-

day morning at 10 o'clock, and from New York every Saturday evening at 6 o'clock. And the sloop Experiment, Elihu S. Bunker, master, for the same purpose, will sail from Hudson every Sunday morning at 9 o'clock, and from New York every Wednesday evening at 5 o'clock throughout the season.

On board the Experiment, Capt. Laban Paddock, May 2, 1810.		
Dr. I—P—,	Dolls.	Cts.
For passage and provisions from Hudson to New York.....	5	00
Spirits.....		
Madeira wine.....		
Port.....		
Sherry.....		
Porter.....		
Cider.....		
Punch.....		

Received payment in full,

ABISHA JENKINS.

In 1807, Fulton made his successful passage to Albany by steam, and in 1810 the old North river steamboat was performing the distance between Albany and New York in thirty-six hours; and Oliver Evans, of Philadelphia, was predicting that the person was then living who would see the distance between Philadelphia and Boston accomplished in three days. This individual made a number of useful improvements. He commenced a steamboat on the Delaware before Fulton, but had not the means to finish it. He was many years in advance of the age in which he lived, and finally died in New York about the year 1819.

The old North river boat, in her original construction, had a strange appearance. Her water wheels were without houses as at the present day; and cross heads connected with the piston, instead of the walking beam now in general use. The countryman, when he first saw her from Hudson, told his wife he had seen the devil going to Albany in a saw mill.

After the North River, the Car of Neptune was built, then the Lady Richmond, the Paragon, the Chancellor Kent, and others. Afterwards, lines were formed to New Brunswick, New Haven, and Providence, and to Charleston and New Orleans; and at a latter period, from Liverpool to Boston and New York, and from New York to Bremen.—Recently, Collins's splendid line of steamers from New York to Liverpool have commenced their trips. In the meantime, the Mississippi and the

great lakes are alive with steamers; and lines are forming to connect with Havre. Railroads are threading the country in every direction, even to competition with the north river. What is to be the end, for steam is yet but in its infancy?

In connection with the sloop Experiment was a project by the same parties to run a horse boat on the North river from Hudson to Albany, uniting at the former place with the sloops. This appears from articles of agreement entered into by the parties, which are now before us. This experiment was made in 1810, and proved a failure. There is reason to suppose the sloops proved profitable at first, but they were driven from the river by the steamboats. They were sold and a final settlement of their accounts was made in February, 1813.

Steamboats on the North river first performed their trips with wood. Lackawana coal was afterwards introduced, by which the expense of fuel was reduced from \$150 a trip to \$30. This was the commencement of a new era in steamboating, hardly less in importance than the original application of steam to boats.—[Sunday Times.

REPORT OF THE COMMISSIONERS APPOINTED TO INQUIRE INTO THE APPLICATION OF IRON TO RAILWAY STRUCTURES.*

Continued from page 309.

It also appeared that, when motion was given to the load, the points of greatest deflexion, and, still more, of the greatest strains, did not remain in the centre of the bars, but were removed nearer to the remote extremity of the bar. The bars, when broken by a travelling load, were always fractured at points beyond their centres, and often broken into four or five pieces, thus indicating the great and unusual strains they had been subjected to.

We have endeavored to discover the laws which connect these results with each other and with practice, and for this purpose a smaller and more delicate apparatus was constructed to examine the phenomena in their simplest form—namely, in the case of a single weight traversing a light elastic bar. For the weight in its passage along the bar deflects it, and thus the path of trajectory of the centre of the weight, instead of being a horizontal straight line, as it would be if the bar were perfectly rigid, becomes a curve, the form of which depends upon the relation between the length, elasticity, and inertia of the bar, the magnitude of the weight, and the velocity imparted to it. If the form of this curve could be perfectly determined in all cases, the effects of travelling loads upon bars would be known; but, unfortunately, the problem in question is so intricate that its complete mathematical solution appears to be beyond the present powers of analysis except in the simplest and most elementary case—namely, in which the load is so arranged as to press upon the bar with one point of contact only, or, in other words, the load is considered as a heavy moving point. In practice, on the contrary, a single four-wheeled carriage touches each rail or girder in two points, and a six-wheeled engine, with its tender, has five or six points in contact on each side. This greatly complicates the problem.

The above smaller apparatus is so arranged as to comply with the simple condition that the load shall press upon one point only of the bar, and is also furnished with a contrivance by which the effects of various proportions of the mass of the bar to that of the load can be examined. From the nature of the problem, it is convenient to consider, in the first place, the forms of the trajectories that are described, and the corresponding deflexions of the bar, when the mass of the bar is exceedingly small compared with that of the load.

Having obtained these under different relations of the length of the bridge, its statical deflexion, and the velocity of the passing load, we proceed to investigate, in addition, the effect which a greater proportional mass of the bar or bridge has upon the deflexions. We have been greatly assisted in this research by a most elaborate and complete analytical investigation by George Stokes, Esq., Fellow of Pembroke College, Cambridge, undertaken at the request of one of the members of the commission. Unfortunately, the extreme difficulty of the problem has rendered its solution unattainable excepting in the cases in which the mass of the

bridge is supposed to be exceedingly small compared with that of the load, and in the opposite case in which the mass of the load is supposed to be small compared with that of the bridge. The examples that occur in practice lie between these two extremes; for in the experiments of the commission, performed at Portsmouth, with the inclined plane already described, the weight of the load was from three to ten times that of the bar; but this is a much greater proportion than that which occurs in bridges, partly on account of the necessity for employing in experiments very flexible bars, to render the changes of deflexion sufficiently apparent, and partly on account of the great difference in length; for if bars bearing the same ratio of weight to that of the load were employed in experiment, the deflexion would become so small as to be scarcely appreciable. This will readily be perceived when it is stated that, in a bridge 33 feet long, a deflexion not greater than one-fourth of an inch is usually allowed, which deflexion is only 1/1440th part of its length; whereas, in experiment, it is necessary to employ deflexions of two or more inches. In actual bridges of about 40 feet span, the weight of the engine and tender is very nearly the same as the weight of that half of the bridge over which it passes; and in large bridges the weight of the load is much less than that of the bridge.

Mr. Stokes has shown that, when the inertia of the bridge is supposed small, the trajectories of the load and the corresponding deflexion of the bridge depend upon a certain quantity, which he terms b ; this quantity varies directly as the square of the length of the bar, and inversely as the product of the central statical deflexion, (namely, that which would be produced by the load set at rest on the centre of the bridge,) and of the square of the velocity with which the load passes over the bridge. When b is small, the increase of deflexion due to the velocity of the load becomes very great, so much so that if b be equal to 1.3, the statical deflexions are doubled, and are tripled when $b = 0.8$; becoming still greater as lesser values of b are taken. On the contrary, greater values of b correspond to small deflexions; and it has been shown by our researches, that, in the cases of real bridges, b is rarely less than 14, and is commonly very much greater; and that, consequently, the greatest increase of deflexion from velocity would be, upon this theory, never greater than one-tenth, varying from that to one-hundredth, or less. As b varies directly as the square of the length of the bridge, it is plain that the nine-foot bars of the Portsmouth experiments will correspond to much less values of b than the 20 and 30-foot lengths of actual bridges; while the values of b in the former cases are still further diminished by the greater deflexions necessarily employed in experiments, as above explained. It is thus shown that the enormous increase of deflexion produced by velocity in the Portsmouth experiments cannot occur with real bridges, since it appears that the phenomena in question are developed to a great extent when the magnitude of the structure is diminished. But these calculations are made upon the supposition that the inertia of the bridge is very small; and experiments made with the small apparatus above mentioned have shown that, while b is less than about unity, the inertia of the bridge tends to diminish the deflexion; while, on the other hand, when b is greater than unity, (including of course, all practical cases,) the inertia of the bridge tends to increase the deflexions, obtained upon the above supposition.—Lastly, the total increase of the statical deflexion, when the inertia of the bridge is taken into account, will be found much greater for short bridges than for long bridges. Supposing, for example, the mass of the travelling load and of the bridge to be nearly equal, the increase of the statical deflexion at the highest velocities, for bridges of 30 feet in length, and of the ordinary degree of stiffness, may be more than one-half; whereas, for bridges of 50 feet in length, the increase will not be greater than one-seventh, and will rapidly diminish as greater lengths are taken. But as it has been shown that the increase *ceteris paribus* is diminished by increasing the stiffness of the bridge, we always have it in our power to reduce its amount within safe limits. Hence in estimating the strength of a railway bridge, this increase of the statical deflexion must be taken into account, by calculating it from

the greatest load which is likely to pass over the bridge, and from the highest possible velocity. It must be remembered, also, that this deflexion is liable to be increased by jerks produced by the passage of the train over the joints of the rails.

We also made some experiments by means of the large apparatus before mentioned, on curved bars, and these bore much greater weights at high velocities than straight bars; but the deflexions of these bars were very great compared with their length. In drawing attention to these experiments, we would remark that, in actual structures, where the deflexions are so very small, the effect of cambering the girders, or of forming a curved pathway for the load, would be of less comparative importance, and might tend to introduce practical inconvenience.

The general impression among engineers appears to be at variance with the above results.—They, for the most part, state their belief that the deflexion caused by passing a weight at a high velocity over a girder, is less than the deflexion which would be produced by the same weight at rest;—even when they have observed an increase, they have attributed it solely to the jerks of the engine or train, produced by passing over inequalities at the junction of the rails, or other similar causes.

For the purpose of examining this question, we have submitted two actual bridges to the test of experiment. These bridges, one of which, the Ewell Bridge, is situated upon the Croydon and Epsom line, and the other, the Godstone Bridge, upon the South Eastern line, are both constructed to carry the railway over a road. A scaffold was constructed, which rested on the road, and was, therefore, unaffected by the motion of the bridge, and a pencil was fixed to the underside of one of the girders of the bridge, so that when the latter was deflected by the weight of the engine or train, either placed at rest or passing over it, the pencil traced the extent of deflexion upon a drawing board attached to the scaffold. An engine and tender, which had been in each case liberally placed under our orders by the directors of the companies, were made to traverse the bridges at different velocities, or rest upon them at pleasure. The span of the Ewell Bridge is 48 feet, and the statical deflexion due to the above load rather more than one-fifth of an inch. This was slightly but decidedly increased when the engine was made to pass over the bridge, and at a velocity of about 50 miles per hour, an increase of one-seventh was observed. As it is known that the strain upon a girder is nearly proportional to the deflexion, it must be inferred that, in this case, the velocity of the load enabled it to exercise the same pressure as if it had been increased by one-seventh, and placed at rest upon the centre of the bridge. The weight of the engine and tender was 39 tons, and the velocity enabled it to exercise a pressure upon the girder equal to a weight of about 45 tons. Similar results were obtained from the Godstone Bridge. We would take this opportunity of mentioning how much we are indebted to Mr. P. W. Barlow, and Mr. Hood, for the assistance they afforded us in making these experiments.

We have also to express our obligations to the Astronomer Royal, for the advantage of his presence during the above and other experiments, as well as for many valuable suggestions during the progress of the inquiry.

In addition to the above experiments, we have made many for the purpose of supplying data for completing the mechanical theory of elastic beams. If it be in any manner bent, its concave side will be compressed, & its convex side extended. An exact knowledge of the laws which govern its compression and extension must precede any accurate general theory of its deflexions, vibrations, and ruptures.

The law which is usually assumed in mathematical investigations, and by which the longitudinal compressions and extensions, within certain limits, are assumed to be directly proportional to the forces by which they are produced, although very nearly true in some bodies, is not, perhaps, accurately true for any material.

Experiments have, therefore, been made to determine with precision the direct longitudinal extension and compression of long bars of cast and wrought iron. The extensions were determined by attaching a bar, 50 feet in length and 1 inch

square, to the roof of a lofty building, and suspending weights to its lower extremity.

The compressions were ascertained by enclosing a bar, 10 feet long and 1 inch square, in a groove placed in a cast iron frame, which allowed the bar to slide freely without friction, and yet permitted no lateral flexure. The bar was then compressed by means of a lever loaded with various weights.—Every possible precaution was taken to ensure accuracy. The following formulæ were deduced for expressing the relation between the extension and compression of a bar of cast iron, 10 feet long and 1 inch square, and the weights producing them respectively:

$$\begin{aligned} \text{Extension, } w &= 116117e - 201905e^2 \\ \text{Compression, } w &= 107763d - 36318d^2 \end{aligned}$$

And the formulæ deduced from these for a bar 1 inch square, and of any length, are—

$$\text{For extension, } w = 13934040 \frac{e}{l} - 2907432000 \frac{e^2}{l^2}$$

$$\text{For compression, } w = 12931560 \frac{d}{l} - 522979200 \frac{d^2}{l^2}$$

Where l is the length of the bar in inches.

These formulæ were obtained from the mean results of four kinds of cast iron.

The mean tensile strength of cast iron derived from these experiments is 15,711 lbs. per square inch, and the ultimate extension 1/600 of the length, and this weight would compress a bar of iron of the same section 1/775 of its length. It must be observed that the usual law is very nearly true for wrought iron.

Many denominations of cast iron have got into common use, of which the properties had not yet been ascertained with due precision. Seventeen kinds of them have been selected, and their tensile and crushing forces determined. Experiments have also been made upon the transverse strength and resistance of bars of wrought and cast iron acted upon by horizontal as well as vertical forces.—These experiments will be found to exhibit very fully the deflexions and sets of cast iron, and the defect of its elasticity.

To be continued.

LAKE SUPERIOR COPPER REGION.

We find in the Lake Superior Journal a communication, signed by Charles Whittlesey, Esq., giving an account of the mining operations in that quarter for the past year, from which we extract the following:

"You and your readers will doubtless wish to know how affairs are progressing in the mining way. To commence with the Minnesota, of which S. O. Knapp, Esq., has charge; they employ about 80 hands; they are this winter chiefly engaged in opening this mine which had in fact been delayed too long for the laudable purpose of getting out last summer what copper could be reached. They will not, I think, have much copper out the coming spring; but will have made a very good commencement towards opening their mine, having newly completed an adit which will completely drain their surface water. They have three shafts down to the depth of some 80 or 90 feet and will this week complete a level connecting the lower part of the middle and east shaft; they are also running a level from opposite this one to the lowest shaft. There is a very good show in the east shaft from which they have taken two masses of a ton each, and they are now stopping from the middle shaft on the lower level. They are commencing the erection of a steam saw mill, and will shortly commence their stamp works, having now about 700 tons of stamp work out.

The Forest Mining Co., formerly known as Col. Cushman's Ontanagon Co., employ about fifteen hands, and have sunk and drifted on the vein in all about 90 feet, besides running an adit of some 30 feet in working this vein which is five or six feet between the walls. They remove nothing but the vein, this works very kindly two shifts, drifting nearly 30 feet in one week, presenting a good show, and having taken out some very good stamp and barrel work. Mr. Stevens has charge of this company. The mineral of the vein is mostly Epidote. The Ridge Mining Co., of which Mr. Chandler

has charge, is working a vein of the same character as the Forest mine. The Indian works upon this location are well defined—there is a mass of some hundreds of pounds exposed. Mr. Chandler is working this vein by drifting upon it—he commenced work late last fall and under very adverse circumstances, and has prosecuted his operations with much energy—the locality is a promising one. This company works about six hands.

About the same force is employed upon the Adventure Mining Co., under a contract to Mr. Spalding. The copper appears to accompany the drift of about 70 feet almost constantly; but the vein is destitute of walls of any kind. This location abounds in shows of copper; indeed there seems to be a difficulty to determine between the different prospects, as on the last named Indian digging are frequent. The Pittsburgh people have recently bought half of the stock of this company for \$10,000.

The Douglass Houghton Co., of which Mr. C. C. Douglass is agent, employs about ten hands.—This company is to work upon what, so far as I am aware, is one of the best defined veins in the country. He has drifted about 70 feet and taken out much excellent stamp work and masses of native copper weighing from 400 lbs. downwards—he commenced late last fall and is doing a first rate business.

The Ontanagon Mining Company of Michigan, of which I have charge, employ ten hands. They own the south half of the location upon which the Minnesota mine is situated. They commenced work late last fall, and have been mainly employed in building, cutting roads, clearing, etc., preparatory to a thorough examination of their very promising location the coming spring. They are at present working a well defined vein of copper in Prehnite and Epidote, from which masses of copper of several hundred weight have been raised. This vein has a very regular foot wall with the same dip and course as the vein of the Minnesota Co.⁷

The States.

In the course of a speech recently delivered in the House of Representatives by the Hon. S. R. Thurston, he gave this information in relation to the extent of the various States of the Union in square miles:

Maine.....35,000	Delaware.....2,120
Vermont.....8,000	Maryland.....11,000
New Hampshire. 8,030	Virginia.....61,352
Massachusetts... 7,250	North Carolina. 45,500
Rhode Island.... 1,250	South Carolina. 28,000
Connecticut.....4,750	Georgia.....58,000
New York.....46,000	Kentucky.....37,680
New Jersey.....6,850	Tennessee.....44,000
Pennsylvania... 47,000	Louisiana.....46,431
Ohio.....39,964	Mississippi.....47,147
Indiana.....33,809	Alabama.....50,712
Illinois.....55,405	Missouri.....67,380
Michigan.....56,243	Arkansas.....52,196
Iowa.....58,914	Florida.....59,268
Wisconsin.....53,294	
Total free States 454,340	Total slave States 610,796
California.....145,000	Texas.....325,520
	936,318
599,340	Dist of Colum'a 50
	936,368
Free States.....599,340	
	337,028

Charcoal Melted.

The possibility of melting charcoal has at length been satisfactorily proved by the experiments of M. Despretz, of Paris. Up to the present time, chemists have considered this an impossibility; M. Despretz, however, not only completely melts this refractory substance, but solders one piece to another, and even volatilizes it. The heat to effect this purpose is generated by a powerful galvanic battery; the light and heat evolved is so great that, even in approaching it, only for an instant, there is danger of violent headache and pain in the eyes. To avoid this the operator conducts his experiments un-

der the shade of thick blue glass. Platinum clippings, and other metals difficult to fuse, are readily converted into a solid mass. This will prove of great service in the arts, and we hope that he will be able to make diamonds, so as to destroy all the attributable value of these baubles.

Comparative Statement of the Receipts of Cotton at the Ports, to the latest dates.

	1850.	1849.
New Orleans, May 7.....	744,767	1,016,954
Mobile, May 3.....	312,319	491,451
Florida, May 1.....	156,402	181,225
Texas, May 1.....	24,945	28,132
Savannah, May 7.....	283,088	343,426
Charleston, May 9.....	312,078	406,553
North Carolina, April 27...	8,705	8,425
Virginia, May 1.....	8,625	11,235
	1,851,829	2,487,401

Decrease.....635,572 bales.

Comparative Exports to Foreign Ports, to latest dates.

	1850.	1849.
New Orleans, May 7.....	451,940	737,469
Mobile, May 3.....	157,441	322,224
Florida, May 1.....	35,838	63,133
Texas, May 1.....	513	2,495
Savannah, May 7.....	105,751	172,533
Charleston, May 9.....	161,744	238,559
Virginia, May 1.....	—	350
New York, May 1.....	165,731	192,396
Other ports, May 1.....	1,604	5,767
	1,080,562	1,734,926

Decrease.....654,364 bales.

Stock on hand at the Ports, and on Shipboard, not cleared.

	1850.	1849.
New Orleans, May 7.....	146,343	189,406
Mobile, May 3.....	82,765	79,327
Florida, May 1.....	25,510	26,248
Texas, May 1.....	726	3,959
Savannah, May 7.....	37,651	35,020
Charleston, May 9.....	59,479	44,591
North Carolina, April 27...	475	395
Virginia, May 1.....	900	1,000
New York, May 1.....	129,211	87,598
	483,060	467,553

Increase.....15,507 bales.

Stocks of Cotton in the Interior Towns, not included in the receipts.

	1850.	1849.
Augusta and Hamburg, May 1.....	61,825	41,772
Macon, Ga., May 1.....	15,514	12,872
Columbus, Ga., May 4....	7,877	—
Griffin, Ga., April 1.....	2,595	—
Montgomery, Ala., Apl. 27.	7,750	3,311
Memphis, Tenn. April 30..	7,402	—
Columbia, S. C., April 1..	10,490	10,245

Telegraphic Communication with Europe.

John A. Roebling, Esq., well known throughout the country as a skillful engineer, has submitted a proposition through the Journal of Commerce, for opening a telegraphic communication between this country and Europe. The following is an abstract of the plan proposed:

The grand object to be attained, is one unbroken length or continuity of wire. To secure this it must be laid upon the bottom of the sea. Once there, it will be safer from all interruptions whatever than any land telegraph. And since the ocean is not more than three or four miles deep in the deepest part, it is very certain that the thing can be done. There is no physical impossibility, nor any unusual difficulty about it. He proves that money will do it, and a very moderate amount of money, too, when compared with the grandeur of the result. He proposes to lay down a wire rope of 20 strands, No. 14 wire, isolated from each other, so that 20

distinct machines could be operated, and 20 messages sent at the same time. It will take eight miles in length of this rope to break by its own weight in the water; therefore it could not break upon being let down into the deepest part of the ocean. The wire rope is to be coated with gutta percha, and to be reeled off from steamers employed for the purpose. He says:

"Thus prepared and sunk upon the bottom of the ocean, it is difficult to assign a limit to its duration. The weight of one mile of rope, manufactured in the manner described, will be one gross ton; its cost on board the steamer I estimate at \$250. This would make \$875,000 for 3500 miles; the whole distance from New York to England, via Boston and New Foundland, with allowances. The cost of chartering, equipping for the service, and running two steamers one trip, including the erection of station houses at the landings, telegraphic machines, etc., ready for operation, I estimate at \$425,000, which will swell the total cost of this most magnificent enterprise to \$1,300,000."

He estimates the profit on the investment at 25 per cent., which is much within the mark, if any such telegraph is ever constructed. To test it, he proposes that the wire rope should first be laid to Newfoundland—one third of the whole distance to England from New York.

This may be practicable—we cannot believe it to be so. Suppose the vessels engaged in reeling off the line, encounter a violent storm, and are driven off from their course, how are they to hold on to it? If any accident should happen to any part, the whole becomes useless. Now the bottom of the ocean is known to be uneven, like the surface of the land. Suppose that the sharp top of some submarine precipice catches the wire, and sustains its whole weight for a great extent of it. Nothing is more likely in such a case, than that the coating would get cut or worn off, in which case the usefulness of the whole is destroyed. Who knows but that there are myriads of marine living creatures who would attack this coating, and destroy it in a very short time; any other supposition is hardly possible.

It is difficult to keep lines of telegraph that are above ground in order for a day. We think if such be the case, that we shall have some difficulty in keeping that in working order which has been deposited in "that bourne from which no traveller returns."

We now go to Europe in ten days in steam ships. This is short time enough in all conscience; as far as our telegraphs are concerned, let us stick to dry land.

Mining in the United States.

Messrs. Foster & Whitney, who were last year appointed to conclude the survey of the U. States copper lands on Lake Superior, by Mr. Secretary Ewing, have completed their labors and have just made their report. It was sent to the House yesterday, or will be sent in a day or two. The report contains a full account of the Mining Region of the Lake Superior country, with some valuable historical details, and statistical tables upon the mining interest of the country and the world. It appears that these copper mines were once worked by an ancient people, the evidence of whose labors exist for a hundred miles along the southern coast of the lake. Tumuli are found, and the opinion is expressed by Messrs. Foster & Whitney that the same people who erected the western mounds worked the copper mines of Lake Superior. Curious facts are adduced in support of this hypothesis. The Jesuits were there as early as 1663, and an accurate map of the country was made by them in 1672, a copy of which is appended to the report, as a striking evidence of the extent and thoroughness

of their explorations of that remote country at so early a period of our history as when Elliot was a missionary among the Aborigines of Massachusetts.

The report shows the significant fact that the annual mining productions of the United States at this day, exceed in value the mineral products of any other country. This is excluding coal. The United States, as a nation, stand at the head of the mining interest. This is an important fact, when taken in connection with a movement that has been agitated here during the winter, to appoint a Metallurgic committee to visit Europe with a view to collect and embody in a report the knowledge at present existing in relation to the whole subject of practical mining—a work very much needed in this country at this opening and important era in our mineralogical history.

The report of Messrs. Foster and Whitney further shows that the entire annual consumption of copper in this country is about 5,000 tons, and that the Lake Superior mines already produce 2,000 tons, and in five years will produce as much as is now the total annual consumption of the country.

The iron district of the lake is now about to be more thoroughly explored by these gentlemen, and a report upon that subject may be expected hereafter. The principal iron region covers a country of about fifty by twenty five miles, and is of exceeding richness, besides possessing great facilities for working. The advantages are alleged to be much greater than are to be found in the great iron mountain of Missouri.

Pennsylvania.

Lehigh Coal and Navigation Co.—We have received the annual report of the Board of Managers of this company, submitted on the 7th inst. From this it appears that during the year 1849 the quantity of coal shipped on the canal was—

	Tons.
From the company's old mines, and from the slope and the tunnels recently bro't into operation.....	276,501
From the Room Run mines.....	102,784
Total from the company's mines.....	379,285
“ Beaver Meadow “.....	73,961
“ Spring Mountain “.....	102,599
“ Hazleton “.....	92,480
“ Cranberry “.....	36,153
“ Sugar Loaf “.....	11,359
“ Buck Mountain “.....	85,819
“ Wyoming Valley, via White Haven.....	19,590

Whole quantity..... 801,246
Being an increase of 120,500 tons over the production of the previous year.

The total amount of freight both ascending and descending, carried on the canal during the year, was 963,960 tons.

The estimate of the business of the canal in the shipment of coal during the current year is considerably beyond that of last year—the production of the Lehigh region being set down at not far short of 900,000 tons.

Alterations and improvements in the planes of the work are being made, and will, it is expected, be completed in season for the opening of the spring business in 1851. This will enable Lehigh boats to go through the canal full loaded, without the necessity of uncoupling the sections of the boats at the foot of each plane.

The debt of the company has been decreased during 1849 by the sum of \$259,425 34.—*Pottsville Journal.*

Leggett's Gap Railroad.—The Honesdale Democrat announces that this work has been commenced, by breaking ground in Abington township, Wyoming county, Pa., at the summit between the Lackawana and Tunkhannock creeks. The prospects of its completion are not at present very promising. The Ithaca and Owego railroad, which belongs to the Leggett's Gap company, has been placed in complete repair, and when the new improvement is made, there will be a direct line of travel between the Lackawana coal fields and the New York and Erie railroad.

The Union Canal.—We learn from the Lebanon courier, that preliminary steps are now being taken for the enlargement of this important link between the Schuylkill and the Susquehanna. It is the intention of the company to proceed as far as possible before stopping the navigation, which they expect to do in October. They design having it so far completed as to be ready for opening with the first spring business. We are glad to hear that the company is in so prosperous a condition, which speaks well for those to whom its management is entrusted. It has been able to obtain a loan on terms much more favorable than has been done by any similar corporation we know of, which shows that it enjoys public confidence. We feel some considerable pride in this company, as we believe it was the first enterprise of the kind commenced in this State, and one of the first of the country.

Reading Railroad.—The receipts of this road for the last five months have been \$644,443, against \$411,499 last year same time, showing an increase of \$232,944. This highly favorable condition of the road has occasioned the late rise in the stock. The comparative receipts of the five months have been as follows:

	1849.	1850.
December, 1848.....	\$82,661 77	\$136,550 51
January.....	76,667 96	96,439 74
February.....	78,710 67	96,797 48
March.....	101,236 00	125,448 87
April.....	72,223 35	189,166 81
Total.....	\$411,499 75	\$644,443 41

Excess \$232,944, or nearly 60 p. cent.

The receipts have been derived from the following sources:

	1849.	1850.
Travel.....	\$54,376 35	\$52,995 30
Freight mds.....	47,515 98	50,107 31
Freight coal.....	303,526 64	535,072 31
Mails.....	3,916 66	3,916 67
Miscellaneous.....	2,164 12	2,351 79

Total..... \$411,499 75 \$644,443 41

The result of these five month's business has been as follows:

Aggregate receipts.....	\$644,443 41
Deduct freight on shipping coal, &c.....	\$19,357 30
Expenses, repairs, &c.....	367,177 94

Net profit..... \$258,907 87

During the same period of last year the aggregate

Receipts were.....	\$405,287 79
Expenses, &c.....	395,487 40

Net profit..... \$9,850 32

New York Railroad Law.

The General Railroad Act.—This important law, recently enacted, consists of fifty-two sections, and fills five and a half columns of the Albany Argus. Its principal provisions are as follows:

It authorizes any number of persons, not less than twenty five, to associate for the purpose of

constructing and operating railways—the amount of capital stock not to be less than \$10,000 for every mile of road proposed to be constructed. When the articles of association are filed in the office of the Secretary of State, the stockholders shall be possessed of such powers as are granted to corporations, but these articles shall not be filed until at least \$1,000 of stock for every mile of the proposed road is subscribed, and 10 per cent. paid in.

Every corporation formed under this act shall have a board of thirteen directors, chosen annually. The stock of such companies shall be deemed personal estate, and be transferable. Each stockholder shall be individually liable to the creditors of the company in a sum equal to the amount unpaid on the stock held by him.

The bill minutely describes the manner in which title may be acquired to real estate required for the purpose of the company in relation to the purchase of which the parties may be unable to agree. Upon a petition being presented to the Supreme Court, held in the district in which the real estate described is situated, praying for the appointment of commissioners of appraisal, the court shall appoint commissioners from persons named by the company and the owners of the real estate proposed to be taken, to determine the compensation which ought justly to be made.

Before constructing any part of their road, every company formed under this act shall make a profile of the route intended to be adopted, to be filed in the office of the clerk of the county in which the road is to be made, and the company shall give written notice to all occupants of the land over which the route of the road is so designated.

The directors of every company formed under this act may, by a vote of two thirds of their whole number, at any time alter or change the route, or any part of the route of their road, if it shall appear to them that the route can be improved thereby.

No company formed under this act shall lay down, or use in the construction of their road, any iron rail of less weight than fifty six pounds per lineal yard, except for turnouts, sidings and switches.

In addition to powers conferred on corporations in the 3d title of the 18th chapter of the 1st part of the Revised Statutes, companies formed under this act shall have power to cause necessary examinations and surveys for it proposed road to be made; to take and hold grants of real estate on other property; to purchase and use all such property as may be necessary for the construction and maintenance of the road; to construct their roads across, along or upon, any street, stream, plank road or canal, to intersect or join its railroad with any other railroad before constructed, etc.

Whenever the railroad of any company formed under this act shall run parallel or nearly parallel to any canal of this State, and within thirty miles of such canal, the company owning such railroad shall pay to the canal fund, on all property transported on its railroad, other than the ordinary baggage of passengers, the same tolls upon that portion of the road running parallel to the canal that have been payable to the State, if such property, other than baggage, had been transported on any such canal.

Every corporation formed under this act shall make an annual report, to be filed in the office of the State Engineer and Surveyor.

The Legislature may alter or reduce the rate of freight, fare, or other profits of such roads; but not to such an extent as to produce, with said profits, less than 10 per cent. per annum on the capital actually expended. An such corporation shall, when applied to by the Postmaster General, convey the mails of the United States on their roads or routes respectively; and in case such corporation shall not agree as to the rate of transportation therefor, and as to the time, rate of speed, etc., it shall be lawful for the Governor of this State to appoint commissioners, who shall determine and fix the prices, terms and conditions aforesaid—but such price shall not be less for carrying the said mails in the regular passenger train than the amount which such corporation would receive as freight on a like weight of merchandise, transported in their merchandise train, and a fair compensation for the postoffice car. All existing railroad corporations within this State, shall respectively have and

possess all the powers and privileges contained in this act. This act to take effect immediately.

AMERICAN RAILROAD JOURNAL.

Saturday, May 25, 1850.

The Pacific Railroad.

We see that Mr. Benton has introduced into the Senate a bill for the grant of public lands in Missouri to aid in building the contemplated railroad from St. Louis to the western line of that State. Should the Missouri route be found to be the most favorable for the above road, the construction by this State of that portion of it within her territory, will shorten so much the extent of line to be built by general government, and relieve it of any embarrassment that might arise from the construction of public works within the limits of the States.

The subject of a railroad to the Pacific seems to possess but very little interest for Congress. We are much disappointed at this, but we presume it receives as much attention as does any subject for the promotion of the general good. The next national legislature we hope to see more imbued with the spirit which pervades the whole country, and turn its attention to the promotion of its real interests. It is very remarkable that while the encouragement of all the useful arts of life is daily accustoming more and more the public mind—that while the class of educated young men, who formerly took up one of the “learned professions” as the business of life, are turning their attention very generally to the physical sciences and to mechanical pursuits—and while so many distinguished men are quitting politics and are dedicating themselves to the promotion of works of public utility—that our chief legislative body should so remove itself, year by year, further from anything that is useful, should give up so much time to abstract speculations, to frivolous and personal quarrels, or to the accomplishment of petty personal and selfish schemes, as to be viewed with general disgust and contempt.—How feebly does the general government represent either the character, pursuits, or wishes of the people. Cannot some means be devised to make the government a part and parcel of the whole country?

To the Editor of the Railroad Journal:

DEAR SIR: At page 338 of the Journal for 1849 a plate was inserted showing my application of Mr. J. E. Smith's patent for laying India-rubber under the joints of rails, also a few remarks on the subject, and considering its great utility and importance in the construction and maintenance of railroads, I am surprised that I have not seen any further notice of it.

In the summer of 1848 I relaid, with new iron, one track of the New Orleans and Carrollton railroad, and adopted the plan of joint chair, and application of India-rubber, shown in the plate referred to, the drawing being one-half the actual size of both rails and chairs used; and I now can state, that after nearly two years of constant transit over the road, of heavy loads of passengers, drawn by 12-ton engines, I find the joints as perfect as when first made, there is no jingling or clinking in passing over them, in fact it is impossible to tell when one is crossed. The rails are firm in their places and the road has not needed the slightest repair since its construction. With this I send you a piece of the rubber that has been under a joint for the time stated. It was taken up five or six days ago at a place where the insertion of a new switch became

necessary. The rails instead of being “hammered into notches in their chairs,” (see “Railway Progress,” page 259 of Journal for the present year,) were not even marked. I look upon this plan as having solved the problem of a good joint, and of course a considerable advance in reducing the cost of “maintenance of permanent way,” also in that of carriage and engine repairs, as well as in the expenditure of fuel. For the details of the expense and method of using the rubber, I refer you to my letter to Mr. J. E. Smith, attached to his advertisement, and inserted in the page and Journal first mentioned.

I am so well satisfied with this use of India-rubber, that I am urged to send this as a contribution to the general stock of knowledge on railroad construction.

I am respectfully yours, etc.,

JOHN HAMPSON,

Eng. N. O. & C. R. R.

Carrollton, La., May 11, 1850.

Ohio and Pennsylvania Railroad.

We learn from the Pittsburgh Gazette that “the grading and masonry of the Ohio and Pennsylvania railroad, from the State line to the intersection of the Cleveland railroad, was let at Salem on Thursday last, to responsible contractors, at rates materially lower than the original estimates of Solomon W. Roberts, Esq., the Chief Engineer. The number of bidders in attendance was large, and the competition highly spirited. The work let comprises thirty two sections, making nearly thirty four miles; and, with the exception of three or four sections, it is generally light. It is to be completed by the first of April next. With the exception of the work immediately adjoining Allegheny city, the whole of the Eastern Division of the railroad, eighty miles in length, is now under contract; and we wish to call the attention of our readers especially to the fact, that when this part of the work is ready for use, we shall have a continuous railroad communication from Pittsburgh to Cincinnati, through Cleveland and Columbus. By proper efforts, this may readily be accomplished next year, but it will require promptness on the part of the stockholders in paying up the instalments called for by the directors. The golden prize is now within our reach, and by a little effort we can secure the most valuable railroad connections, in advance of the projects of our rivals, both on the north and on the south of us.”

The Iron Business.

One of the most interesting of the many documents accompanying the report of the treasury, is a letter from Charles E. Smith, Esq., of Philadelphia, on the prices and cost of manufacturing iron in England and in this country. It is well known how largely labor enters in the manufacture of iron, and Mr. Smith shows that, while in Great Britain the cost of labor in the manufacture of iron amounts to only \$3.71. The Pittsburgh American, in remarking upon this striking fact, says this American price of \$11, is what is paid at the east, but at Pittsburgh, even the present reduced prices at one fourth greater, say \$2.75, making the entire cost of labor there \$13.75, or ten dollars and four cents more per ton than is paid for labor by the English manufacturers. The Pittsburgh iron makers are paying, therefore, nearly four times as much for labor per ton as their English and Scotch competitors. The American says further the mills of that city average about 5,000 tons a year. The amount paid to labor in England for

the production of 5,000 tons is \$18,550, while in Pittsburgh is \$68,750. Taking the ten mills in Pittsburgh (there are twelve in all), which average 5,000 tons each annually, there is paid for labor \$687,500, while the same number of mills of equal production in England would pay for the labor \$185,500, showing an excess in the case of these ten mills alone, of over five hundred thousand dollars more being paid for labor annually, than the production of the same amount of iron would cost in England.

New York.

Watertown and Rome Railroad.—This road is to run from Rome to Cape Vincent, on the river St. Lawrence, opposite Kingston. It will effectually annex Canada to New York, commercially if not politically. Kingston is the centre of five hundred thousand inhabitants of Canada West—is the natural point of egress and ingress at all times, and in winter the only available one. To show what the trade of Canada West will be, it is only necessary to mention that the produce from that province which passed through Oswego during the last season, amounted to one hundred and ten thousand tons; and the exports through the same port to Canada, amounted in value to some \$2,500,000.—The above route will compete successfully with that of Oswego, in summer, and command the whole business in winter.

Business is rapidly increasing with Canada, under the drawback and warehousing laws, and as facilities are also increasing, her trade, already large, will soon be doubled. Aside from this, the road runs through one of the best portions of this State, with an enterprising and dense population of over 1200 to the mile. The road is quietly progressing and with great economy, and it is confidently believed the whole (97 miles) will be completed and put in operation for \$1,300,000. Five thousand tons of iron (T rail, 56 lbs. per yard) have been purchased at the lowest rate, somewhat below the estimate, and a portion of it is already delivered on the road. Engines and cars have also been contracted for, and it is expected the road will be put in operation from Rome to Piermont Manor, a distance of 53 miles, the present season. The reliable means of the road are already \$800,000, and increasing.—*Albany Journal.*

New Jersey.

Election of Officers.—A meeting of the Delaware and Raritan canal company was held on the 10th inst., at their office at Princeton basin, when an election for officers was held with the following result: President, R. F. Stockton; Treasurer, James Neilson; Secretary, John R. Thompson; Directors, Robert F. Stockton, Garritt D. Wall, James Parker, James Neilson, James S. Green, James Potter, John R. Thompson, John C. Stevens.

Missouri.

The Pacific Railway.

The city council of St. Louis is about to subscribe to this great enterprise, the \$500,000 authorized by a recent vote of the people. Private subscriptions have not yet reached that amount, but it is supposed that they soon will. When they do, the acting directors propose to go into the counties of Missouri that lie along the line, and in them they count upon getting very liberal subscriptions.

It is announced as the intention of the board to commence operations on the road in St. Louis, and proceed westwardly in its construction, as far and as fast as their means will permit. The Republican says that the first important point reached will

be the St. Louis coal field, about six miles out of the city, which will hardly fail to give a business to the road, that will make that much of it at least, pay. The next important point, perhaps, will be the Merrimac, where a valuable business in lumber, wood, farm produce, ores, metals, etc., will grow up. From this point westward to the Osage, the road will receive a large business from the products of farms, mines and forests.—*St. Louis Intelligencer*.

Maine.

Atlantic and St. Lawrence Railroad.

Two cargoes of iron have arrived in Portland for the use of this road, and the laying of the rails from Paris to Bethel will be commenced without delay. Both ends of this great work, in the States and in Canada, are progressing rapidly, and with the ample means at the command of the companies there can be no doubt of the completion of the road within the time agreed upon.

Massachusetts.

The annual report of the Stockbridge and Pittsfield railroad company has been published. This road, which is an extension of the Housatonic, northwardly, was completed in January, 1850, and has since been operated by the Housatonic railroad company, which has a lease of it at 7 per cent. on the cost, which is about \$450,000. Thus far it is understood that the business of the road has considerably exceeded the expectations of the Housatonic company, although many manufacturing establishments on the line of the road have not been in operation for some time past. The length of the whole road from Bridgeport to Pittsfield, including the Berkshire road to West Stockbridge, is about 120 miles. Of this distance the Stockbridge and Pittsfield and Berkshire roads make 44 miles. The whole cost of the line is about \$3,000,000. Of this cost the Housatonic and Berkshire make \$2,550,000. The net earnings of these roads in 1849 were \$153,900, or a little over 6 per cent.

Election of Railway Directors.

On the 8th inst., the stockholders of the Hillsborough and Cincinnati railroad company met in this place and re-elected their old directors. W. W. Sloan, Esq., was elected in the place of Mr. C. Jackson, deceased, and the board, as now constituted, is as follows:

W. O. Collins, J. Winston Price, W. H. Baldwin, S. J. Spees, N. W. Ayres, W. W. Sloan, John Barry.—*Hillsboro' Gaz.*

Virginia.

Manassas Gap Railroad.—A convention of the friends of the Manassas Gap railroad, from Alexandria to some point in the valley, was held at Front Royal a short time since. About sixty delegates were present. As evidence of the feeling on the subject in Shenandoah, it is stated that one gentleman, who was present at the convention, will give \$5,000. The citizens of Alexandria, by a vote of 501 to 7, have authorized a subscription of \$150,000 on the part of the corporation, to the stock of the railroad. The County Court of Rockingham have taken preliminary steps for submitting to the people the question of subscribing the same amount.

NEW YORK AND NEW HAVEN RAILROAD.

At the annual meeting of the New York and New Haven railroad company, last week, the following gentlemen were elected: Robert Schuyler, Morris Ketchum, Jonathan Sturgis, Anson G. Phelps, Elihu Townsend, of New York; Henry J. Sanford,

of Stamford, Conn.; William P. Burrall, of Bridgeport, Conn.; John E. Thayer, of Boston, Mass.; Wm. W. Boardman, of New Haven, Conn.

Kentucky.

At an election held in the Council Chamber, in the city of Maysville, for president and directors of the Maysville and Lexington railroad company, the following gentlemen were elected:

PRESIDENT, Richard Collins.

DIRECTORS—A. M. January, C. Schultz, F. T. Hord, W. S. Allen, H. Waller, and John Norton.—*Maysville Eagle*.

Pennsylvania.

The Pittsburgh American states that of the 122 furnaces recently in operation in the counties comprising the iron region of western Pennsylvania, but 59 are now in blast, producing 47,200 tons per annum. The whole number of furnaces make, when in operation, 97,600 tons. This shows a net loss in the industrial products of the country of 50,000 tons annually. That this cannot be attributed to there being no demand, is shown by the fact that in the years when the production is greatest, the prices were highest. In this view then the actual loss may be stated in money thus:

97,600 tons, at an average of \$30 per ton.	\$2,928,000
47,200 tons, at its present average, \$22 per ton.	1,034,400

We have an amount of loss to these counties of.....\$1,893,600

The American tells us that of the 59 furnaces now in operation, about two thirds are making their last blast; and that in 1851 not over 20, if as many, will be in operation.

Steamer Atlantic.

This great steamer did not fulfil the expectations of the public in her passage to Liverpool. It occupied thirteen, instead of ten days, as expected. A part of the machinery gave out, which caused much delay.

Great Tunnel of the Alps.

To complete a direct line of railroad communication between Boulogne and Venice and Ancona, and consequently, between London and the Adriatic, one only obstacle lies in the way. The chain of Mont Cenis and Mont Genevre, running nearly northeast and southwest, would cross such a line, and present, with their elevation of 11,000 feet, an insurmountable bar to any direct and continuous railway. From London, as far as Chambery, by the Lyons railroad, all is smooth enough; nay, that rail can and will, and indeed, is now about to push further, ascending to Mont Meiland, and Maurienne (names well known to old post travellers, who directed their steps along the valley of the Arc, towards Lanslebourg), and, by an ulterior effort, it will yet reach higher, as far as Modane, at the foot of the northern crest of the Graian and Cottain Alps. But once there, all progress is arrested, and no train can hope to reach the Italian side to Susa and Turin, and thence to the eastern coasts of the peninsula, unless a subterranean wayfare be pierced through the snow capped barrier. What a magnificent problem is here presented to the inventive genius of the age! What splendid results to be attained by its successful solution! Such a problem has been actually under the consideration of the Sardinian government since August, 1845. Its solution is no longer a matter of doubt. The possibility of boring through the heart of Mont Genevre, and of linking Chambery with Susa, north and south of that range, is a demonstrated truth. The great tunnel of the Alps is about to become a reality, under the auspices of Victor Emanuel and the Piedmontese Parliament. The author of this gigantic scheme is the Chevalier Henry Maus, honorary inspector of the *Genie Civil*, the same who advised and executed the great works on the Liege

railroad. After five years of incessant study of the question, and many practical experiments and calculations, including the invention of new machinery for boring the mountain, this officer made his final report to the government on the 8th February, 1849. A commission was thereupon named on the 13th July, 1849, consisting of several distinguished civil engineers, artillery officers, senators, members of the government, and a professor of geology, to examine and give their opinion on the nature and feasibility of Chevalier Maus' project.—That commission on the 1st November last, being then under the presidency of the Minister of Public works, the Chevalier Paleocapa, decided unanimously and entirely in favor of the project. Their report, together with that of Chevalier Maus, has recently been printed for private distribution, by order of the Sardinian government, illustrated by maps and plans, and all the various calculations, not only of expense, but of the mechanical difficulties also which this great and striking project presents. An application for a part of the funds required to begin the great tunnel will be made to the Chambers forthwith, and the work, which it is expected will occupy five years, will cost 14,000,000f.; while the entire railroad of the Alps, connecting the tunnel with the Chambery railway on the one side (in length together 36,565 metres, or 20½ English miles), will cost 21,000,000f. more, forming a total expense of 35,000,000f. The great tunnel itself will measure 12,209 metres, or nearly seven English miles in length; its greatest height will 19 feet, and its width 25, admitting of course, of a double line of rail. Its northern entrance is to be at Modane, and the southern entrance at Bardonneche, on the river Mardovine. This latter entrance, being the highest point of the intended line of rail, will be 4,032 feet above the level of the sea, and yet 2,400 feet below the highest or culminating point of the great road or pass, over the Mont Cenis. It is intended to divide the connecting lines of rail leading to either entrance of the tunnel into eight inclined planes of 5,000 metres, or 2½ English miles each, worked like those at Liege, by endless cables and stationary engines, but in the present case moved by water power derived from the torrents. The most remarkable part of the project, however, is the newly devised machinery and motive power by which the Chevalier Maus proposes to bore the great tunnel. It is as ingenious as it is new, presenting some extraordinary facts in mechanics which could hardly have been anticipated, but the truth of which has been tested and verified by practical essays made with working models of the natural size, before the government commission already mentioned. But these, and the consideration of the immense results, social, commercial, and political, that may be expected to flow from such a gigantic undertaking, in comparison with which the Thames tunnel and the Britannia bridge becomes secondary objects, may form the subject of another article.—*Irish Railway Gaz.*

An Essay on Pen and Pocket Cutlery,

Embracing a Detailed Description of the Mechanical, Chemical, and Manual Operations Performed on Certain Raw Materials, to Convert them into the Means, Implements, and Materials, for Manufacturing Pen and Pocket Knives.

BY A. L. HOLLEY.

CHAPTER I.—A GENERAL VIEW OF CUTLERY, AND OF THE MODE OF MANUFACTURING PEN AND POCKET KNIVES.

Cutlery has been in use from the earliest ages of the world, and in its different forms, it is, and ever has been among the chief implements in war, manufactures, agriculture and architecture. It is indispensable everywhere, and in almost every kind of business, and pocket knives may be found in the possession of almost every man, woman and child in christendom. Cutlery was probably among the earliest articles ever manufactured, and was first made in England in the year 1563. Here, the first specimens were of the coarser and larger kind, unwieldy and imperfect, though made expensively and with much labor. These, and the means and processes of making them, have met with great

changes and improvements, and long experience in the business has produced many other varieties, which convenience and necessity have demanded, so that, at the present time, we have cutlery instruments in every desirable shape and form, each perfectly adapted to its particular work. The chief point, and requisite in any piece of cutlery, is a *good blade*, one that will cut fast and easily, that has and will retain a fine edge. The excellence or imperfection of the other parts, however, are not usually in proportion to the quality of the blade, as some endeavor to make knives that will cut, whether finished expensively, or roughly, and others enclose cast iron blades, in a profusion of polished silver and pearl. In regard to the other parts of pocket knives, there are as many different tastes as there are varieties. Within the last century at least, the manufacture of cutlery has been confined almost exclusively to London and Sheffield in England, the former city having produced chiefly fine, and the latter larger and coarser kinds, though at present the best pocket knives originate there, and owing to its local advantages and division of labor, all varieties are made there cheaper, and in greater quantities than in London. The cutlery of England has long been held in justly high estimation, and considered superior to any in the world, but the fact that the English have made, and exported, great quantities of mere trash, and passed off iron blades for steel, together with the enterprise, thoroughness and honesty of cutlers on the western continent, has given great celebrity to American cutlery, and its reputation is constantly improving. Blades are generally bought for, expected to be, and usually are, steel, but several Sheffield cutlers have tarnished their fame, and their blades, and imposed upon the community, by obtaining a patent for, and producing large quantities of blades, cast directly from a certain kind of iron. If those were distinctly marked, and sold for *cast iron*, no fault could be found, as the purchaser would then know what he was buying; but they are warranted to be, and placed in market for, the *best steel*, and are not only introduced among coarse, but fine knives, holding a good edge for a short time, and being susceptible of so high a polish, that the most experienced judges can with difficulty detect the cheat at sight. This iron is, from the superabundance of its carbon, highly susceptible of liquidity, and readily cast into the required form. In this state the blades are very hard and brittle as glass, but are softened by decomposition, being subjected to a strong and long continued fire, in close vessels, and in contact with iron ore, or any substance containing oxygen, with which this extra carbon combines. This indeed saves all the trouble and expense of forging blades and purchasing steel, but on the other hand it is a system of robbery, carried on to the imminent detriment of the science of "Whittleology," in all its numerous branches. As aforesaid, the manufacture of cutlery has been confined almost wholly to Great Britain, but recently English operatives have immigrated to this country, and of these Americans have learned the fundamental principles of the trades, and leaving the beaten track of exclusive manual labor, are introducing their various improvements, and substituting machinery to perform quicker and more perfectly many of those operations formerly accomplished wholly by hand. Although many and important improvements are yet to be made, the work, as we shall show, is not capable of being wholly executed by machines. The manufacture of pocket knives in London has been divided into two separate

trades, the blade maker's and the handle maker's. In Sheffield it now is, and at first was in the United States, carried on in four separate trades, viz: the blade, and the spring forger's, the grinders, and the cutlers. In addition to forging the blades, it is the business of the blade forger to mark, harden and temper them. They are ground, glazed and polished by the grinder, and the cutler makes the handle and finishes the knife. To carry on the business, at least 42 different kinds of materials must be constantly on hand, and from 75 to 80 different tools used. A well-made, shell handle, four blade knife, passes through 387 different operations, before it is ready for market, exclusive of those performed on materials before they are prepared for knife making, which, if taken into account, would at least double the number. The forger's business is easily accomplished, being much lighter than common blacksmithing, pleasant and lucrative. The grinder's is not hard, though unhealthy in some cases, but better in a pecuniary point of view than either of the others. The cutler's is pleasanter than either trade, and not unhealthy. The manipulations are easy, and must be skillfully performed. The spring forger's labor is now entirely dispensed with in America, machinery having been put into operation which executes his work much more rapidly and perfectly. American cutlers are now adopting a plan which bids fair greatly to facilitate the manufacture of knives, viz: to subdivide the cutler's trade. For instance, instead of obliging each man of twelve cutlers to make *wholly* a dozen knives, to have each man become master of one particular *branch* of the cutler's trade, and perform certain operations on every knife of the twelve dozen. Thus the operatives each doing a certain part, can expedite and perfect the performance of the various operations. By such a division of labor, the business is divided into many different trades, each dependent on the others. The use of machinery will of course be favorable to this place, and to all who wish to purchase cheap knives, as a boy, for a quarter of a dollar per day, can with a machine accomplish the work of half a dozen men at two dollars each. We have reason to believe, that after this business has been a few years longer in the hands of skilful and scientific Americans, the aforesaid improvements will be enlarged, and perfected, and new and easily wrought substances and compositions will be introduced, which shall make good the places of materials now expensive, and imperfectly answering the purpose. The consequences of this will be excellent cutlery, perfectly adapted to its work, at a very low price.

To be continued.

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98 Broadway, opposite Trinity Church.
New York, October, 1849.

Notice to Contractors.

PROPOSALS will be received at the Office of the Morris Canal and Banking Co., Jersey City, till the 1st day of June next, for the Grading Masonry and Timber work for ten inclined planes on the western division of said canal, to be constructed on the same plan as Plane 6, west. Plans and specifications will be ready at the said Office and at the Office of the Assistant Engineer at Mansfield, Warr n Co., on and after the 25th inst. Contracts to be entered into, and the work commenced immediately after the letting.

On the 30th instant the water will be drawn out of the canal at the head and foot of Plane 6 west, from 10 o'clock A.M. till 3 P.M., to give contractors an opportunity to examine the work to be constructed in the bottom of the canal.

The most satisfactory testimonials of character and responsibility must accompany the bids, and bidders are requested to state what other work, if any, they are engaged in, and the time when such work will be finished. W. H. TALCOTT, Supt. and Eng.
Jersey City, May 14, 1850.

Hudson River Railroad.

NOTICE FOR PROPOSALS.

SEALED Proposals will be received by the Directors of the Hudson River Railroad Company, at their Office, 54 Wall st., New York, until Monday noon, the 27th day of May inst., for the grading, masonry, bridging and pile bridging, to be done on the 5th Division, embracing sections No. 54 to 71 inclusive, extending from Poughkeepsie 18 miles, to Garretson's Point, two miles above Rhinebeck.

This line may be examined with plans and specifications of the work, at the office of H. A. GARDNER, Resident Engineer, in Poughkeepsie, from the present time.

Also, there will be let at the same time, Division No. 8, embracing Sections No. 86 to 100 inclusive, extending 18 miles from Stuyvesant to the Northern termination of the road at East Albany. This line and plans of work may be examined by reference to EDMUND FRENCH, Resident Engineer of this Division, at his office in Albany, after Sunday, the 19th day of this month. Proposals may be made by Sections or by Divisions. The work on the 8th Division to be finished on or before the 1st day of February next, and that on the 5th Division on or before the 1st day of July, 1851. The remaining and intermediate Divisions and Sections will be ready to be let after a short period, when due notice will be given. The Directors reserve to themselves the right to accept or reject proposals that may be offered, as they may consider the interest of the company to require.

The party to any proposition which may be accepted, will be required to enter into contract immediately after acceptance of the same.

The names, in full, of all parties proposing to be interested in contracts, must be given in the propositions and no assignment or transfer of the bid, or contract, will be permitted.

A reserve of 20 per cent. on the monthly estimate will be retained by the company, until the contract is completed, as security for performance.

WM. C. YOUNG, Chief Engineer.
Office Hudson River Railroad Co.,
54 Wall st., May 14, 1850.

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This book has been compiled somewhat on the plan of Bradshaw's Guide, with such improvements in size, form and arrangement as have seemed desirable; and the publisher confidently hopes it will not be found liable to the objections of incompleteness and incorrectness, which have been made, and justly too, against various other similar works heretofore issued.

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February 9, 1850.

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TRENTON, N. J.

Samuel D. Willmott,
MERCHANT, AND MANUFACTURER OF
CAST STEEL WARRANTED SAWS,
—AND FILES—
IMPORTER OF THE
GENUINE WICKERSLY GRINDSTONES
NO. 8 LIBERTY STREET,
NEW YORK.

Doremus & Harris,
ANALYTICAL & CONSULTING CHEMISTS,
179 BROADWAY, NEW YORK.
SCHOOL OF CHEMISTRY.

IRON.

Railroad Iron.
3,000 TONS C. L. MAKE 63½ lbs. per yard,
now landing and to arrive.
Also contracts made for future delivery of above su-
perior make English Iron.
300 Tons Banks Best Iron, Round, Square and Flat.
200 " English Bar " " " "
10 " 9-16 Square Iron for Railroad Spikes.
For sale in lots to suit purchasers by
DAVID W. WETMORE.
New York, March 26, 1850. 3m

**SPRING STEEL FOR LOCOMOTIVES, TEN-
DERS AND CARS.**—The subscriber is engaged
in manufacturing spring steel from 1½ to 6 inches in
width, and of any thickness required: large quantities
are yearly furnished for railroad purposes, and where-
ever used its quality has been approved of. The estab-
lishment being large, can execute orders with great
promptitude, at reasonable prices, and the quality war-
ranted. Address J. F. WINSLOW, Agent,
Albany Iron and Nail Works.

Railroad Iron.
THE Undersigned, Agents for Manufacturers, are
prepared to contract to deliver Rails of superior
quality, and of any size or pattern, to any ports of dis-
charge in the United States.
COLLINS, VOSE & CO.,
156 South St.
New York, November 17, 1849.

Railroad Iron.
1,500 Tons weighing 58 lbs. per lineal yard.
500 " " 57 " " "
500 " " 56 " " "
500 " " 60 & 61 lbs. "
Also 2½x½ flat rails. All the above being of approv-
ed patterns. For sale by
DAVIS, BROOKS, & CO.,
68 Broad street.

N.B.—Rails imported on commission, or at a fixed
price.

Iron.
Pig Iron, Anthracite and Charcoal; Boiler and Flue
Iron, Spring and Blistered Steel, Nail Rods, Best Re-
fined Bar Iron, Railroad Iron, Car Axles, Nails, Stove
Castings, Cast Iron Pipes of all sizes, Railway Chairs
of approved patterns for sale by
COLEMAN, KELTON & CAMBELL,
109 N. Water St., Philadelphia.

IRONDALE PIG METAL, MANUFACTURED
for sale by the Bloomsburg Railroad Iron Co.
DUDLEY FISHER, Treasurer.
75 N. Water St., Philadelphia.

Railroad Iron.
500 Tons, afloat, weighing 57 pounds per lineal
yard, for sale by
COLLINS, VOSE & CO.,
156 South St.
New York, November 17, 1849. 1m46

Railroad Iron.
1675 Tons, weighing about 61 lbs. per yard, 90
tons, weighing about 52 lbs. per yard, and
825 tons, weighing about 53½ lbs. per yard, of the lat-
est and most approved patterns of T rail, for sale by
BOORMAN, JOHNSTON & CO.,
119 Greenwich street.
New York, Feb. 25, 1850.

N.B.—B. J. & Co are also prepared to take con-
tracts for English rails, delivered in any of the Atlan-
tic ports of the United States.

Railroad Iron.
THE UNDERSIGNED, HAVING made arrange-
ments abroad, are prepared to contract for the deliv-
ery of Foreign rails, of approved brands upon the
most favorable terms.
They will also make contracts for American rails,
made at their Trenton works, from Andover Iron, in
whole or in part, as may be agreed upon.
They are prepared to furnish Telegraph, Spring and
Market Wire; Braziers and Wire Rods; Rivets and
Merchant Bars to order, all made exclusively from An-
dover Iron. The attention of parties who require iron
of the very best quality for special purposes, is respect-
fully invited.
COOPER & HEWITT,
17 Burling Slip, New York.

February 15, 1850.

Glendon Refined Iron.

Round Iron, Band Iron, Hoop Iron,
Square " Flat " Scroll "
Axles, Locomotive Tyres,
Manufactured at the Glendon Mills, East Boston, for
sale by GEORGE GARDNER & CO.,
5 Liberty Square, Boston, Mass.
Sept. 15, 1849. 3m37

**PATENT HAMMERED RAILROAD, SHIP &
BOAT SPIKES.**—The Albany Iron Works
have always on hand, of their own manufacture, a
large assortment of Railroad, Ship and Boat Spikes
from 2 to 12 inches in length, and of any form of head.
From the excellence of the material always used in
their manufacture, and their very general use for rail-
roads and other purposes in this country, the manu-
facturers have no hesitation in warranting them fully
equal to the best spikes in market, both as to quality
and appearance. All orders addressed to the subscrib-
ers at the works will be promptly executed.

JOHN F. WINSLOW, Agent.
Albany Iron and Nail Works, Troy, N. Y.
The above Spikes may be had at fact prices,
Erastus Corning & Co Albany; Merrill & Co., New
York; E. Pratt & Br. 1st, Eastmore Md

**LAP—WELDED
WROUGHT IRON TUBES**
FOR
TUBULAR BOILERS,
FROM ONE AND A QUARTER TO SEVEN
INCHES IN DIAMETER.

THE ONLY Tubes of the same quality and man-
ufacture as those so extensively used in England,
Scotland, France and Germany, for Locomotive, Ma-
rine and other Steam Engine Boilers.
THOMAS PROSSER & SON, Patentees,
28 Platt street, New York.

Railroad Iron.
THE UNDERSIGNED ARE PREPARED TO
contract for the delivery of English Railroad Iron
of favorite brands, during the Spring. They also re-
ceive orders for the importation of Pig, Bar, Sheet, etc.
Iron.
THOMAS B. SANDS & CO.,
22 South William street,
New York.
February 3, 1849.

Iron Store.
THE Subscribers, having the selling agency of the
following named Rolling Mills, viz: Norristown,
Rough and Ready, Kensington, Triadelphia, Potts-
grove and Thorndale, can supply Railroad Companies,
Merchants and others, at the wholesale mill prices for
bars of all sizes, sheets cut to order as large as 58 in.
diameter; Railroad Iron, domestic and foreign; Locomo-
tive tire welded to given size; Chairs and Spikes;
Iron for shafting, locomotive and general machine;
purposes; Cast, Shear, Blister and Spring Steel; Boil-
er rivets; Copper; Pig iron, etc., etc.
MORRIS, JONES & CO.,
Iron Merchants,
Schuylkill 7th and Market Sts., Philadelphia.
August 16, 1849. 1y33

Railroad Iron.
THE MOUNT SAVAGE IRON WORKS, AL-
legany county, Maryland, having recently pass-
ed into the hands of new proprietors, are now prepar-
ed, with increased facilities, to execute orders for any
of the various patterns of Railroad Iron. Communi-
cations addressed to either of the subscribers will have
prompt attention. J. F. WINSLOW, President
Troy, N. Y.

ERASTUS CORNING, Albany
WARREN DELANO, Jr., N. Y.
JOHN M. FORBES, Boston.
ENOCH PRATT, Baltimore, Md.
November 6, 1848.

Railroad Iron.
THE SUBSCRIBERS ARE PREPARED TO
take orders for Railroad Iron to be made at their
Phoenix Iron Works, situated on the Schuylkill River,
near this city, and at their Safe Harbor Iron Works,
situated in Lancaster County, on the Susquehanna
river; which two establishments are now turning out
upwards of 1800 tons of finished rails per month.
Companies desirous of contracting will be promptly
supplied with rails of any required pattern, and of the
very best quality.

REEVES, BUCK & CO.,
45 North Water St., Philadelphia,
March 15, 1849.

Monument Foundry.

A. & W. DENMEAD & SON,
Corner of North and Monument Sts.,—Baltimore,
HAVING THEIR

IRON FOUNDRY AND MACHINE SHOP

In complete operation, are prepared to execute faithfully and promptly, orders for Locomotive or Stationary Steam Engines, Woolen, Cotton, Flour, Rice, Sugar Grist, or Saw Mills, Slide, Hand or Chuck Lathes, Machinery for cutting all kinds of Gearing, Hydraulic, Tobacco and other Presses, Car and Locomotive patent Ring Wheels, warranted, Bridge and Mill Castings of every description, Gas and Water Pipes of all sizes, warranted, Railroad Wheels with best faggotted axle, furnished and fitted up for use, complete

Being provided with Heavy Lathes for Boring and Turning Screws, Cylinders, etc., we can furnish them of any pitch, length or pattern.

Old Machinery Renewed or Repaired—and Estimates for Work in any part of the United States furnished at short notice.

June 8, 1849.

Iron Wire.

REFINED IRON WIRE OF ALL KINDS, Card, Reed, Cotton-flyer, Annealed, Broom, Buckle, and Spring Wire. Also all kinds of Round, Flat or Oval Wire, best adapted to various machine purposes, annealed and tempered, straightened and cut any length, manufactured and sold by

ICHABOD WASHBURN.

Worcester, Mass., May 25, 1849.

American and Foreign Iron.

FOR SALE,

300 Tons A 1, Iron Dale Foundry Iron.

100 " 1, " " " "

100 " 2, " " " "

100 " " Forge " "

400 " Wilkesbarre " "

100 " "Roaring Run" Foundry Iron.

300 " Fort " " "

50 " Catoctin " " "

250 " Chikiswalungo " " "

50 " "Columbia" "chilling" iron, a very superior article for car wheels.

75 " "Columbia" refined boiler blooms.

30 " 1 x 1/2 Slit iron.

50 " Best Penna. boiler iron.

50 " "Puddled" " "

50 " Bagnall & Sons refined bar iron.

50 " Common bar iron.

Locomotive and other boiler iron furnished to order.

GOODHUE & CO.,

New York.

64 South street

American Pig, Bloom and Boiler Iron.

HENRY THOMPSON & SON,

No 57 South Gay St., Baltimore, Md.,

Offer for sale Hot Blast Charcoal Pig Iron made at the Catoctin (Maryland), and Taylor (Virginia), Furnaces; Cold Blast Charcoal Pig Iron from the Cloverdale and Catawba, Va., Furnaces, suitable for Wheels or Machinery requiring extra strength; also Boiler and Flue Iron from the mills of Edge & Hilles in Delaware, and best quality Boiler Blooms made from Cold Blast Pig Iron at the Shenandoah Works, Va. The productions of the above establishments can always be had at the lowest market price, for approved paper.

American Pig Iron of other brands, and Rolled and Hammered Bar Iron furnished at lowest prices. Agents for Watson's Perth Amboy Fire Bricks, and Rich & Co's New York Salamander Iron Chests. Baltimore, June 14, 1849. 6 mos

Wheel, Forge and Foundry Iron.

LOCUST GROVE Wheel Iron of great strength and superior chilling property. Balt. Charcoal Forge Iron, from Patuxent, Curtis Creek and Gunpowder furnaces.

Elkridge Foundry Iron, of superior strength and softness. Anthracite and Charcoal Iron from Pennsylvania and Virginia. Gas and Water Pipes, Lamp Posts from Elkridge furnace.

LEMMON & GLENN,

6m9

62 Buchanan's Wharf, Baltimore.

Iron.

THE SUBSCRIBERS having resumed the agency of the New-Jersey Iron Company, are prepared to execute orders for the different kinds and sizes of iron usually made at the works of the company, and offer for sale on advantageous terms.—

150 tons No. 1 Boonton Foundry Pig Iron.

100 " No. 2 do. do. do.

300 " Nos. 2 & 3 Forge do. do.

100 " No. 2 Glendon do. do.

140 " Nos. 2 & 3 Lehigh Crane do do.

100 " No. 1 Pompton Charcoal do.

100 " New-Jersey Blooms

50 " New-Jersey Faggoting Iron, for shafts

Best Bars, 1/2 to 4 inch by 1/2 to 1 inch thick.

Do do Rounds and Squares, 1/2 to 3 inch.

Rounds and Squares, 3-16 to 1 inch.

Half Rounds, 1/2 to 1 in. Ovals & Half Ovals 1/2 to 1 1/2 in.

Bands, 1/2 to 4 inch. Hoops, 1/2 to 2 inch.

Trunk Hoops, 1/2 to 1 1/2 in. Horse Shoe & Nut Iron.

Nail Plates. Railroad Spikes.

DUDLEY B. FULLER & Co., 139 Greenwich-

st. and 85 Broad-st.

WILLIAM JESSOP & SONS' CELEBRATED CAST-STEEL.

The subscribers have on hand, and are constantly receiving from their manufactory,

PARK WORKS, SHEFFIELD,

Double Refined Cast Steel—square, flat and octagon.

Best warranted Cast Steel—square, flat and octagon.

Best double and single Shear Steel—warranted.

Machinery Steel—round.

Best and 2d gy. Sheet Steel—for saws and other purposes.

German Steel—flat and square, "W. I. & S." "Eagle" and "Goat" stamps.

Genuine "Sykes," L Blister Steel.

Best English Blister Steel, etc., etc., etc.

All of which are offered for sale on the most favorable terms by

WM. JESSOP & SONS,

91 John street, New York.

Also by their Agents—

Curtis & Hand, 47 Commerce street, Philadelphia.

Alex'r Fullerton & Co., 119 Milk street, Boston.

Stickney & Beatty, South Charles street, Baltimore.

May 6, 1848.

JOHNSON, CAMMELL & Co's Celebrated Cast Steel,

AND

ENGINEERING AND MACHINE FILES, which for quality and adaptation to mechanical uses, have been proved superior to any in the United States. Every description of square, octagon, flat and round cast steel, sheet, shovel and railway spring steel, best double and single shear steel, German steel, flat and square, goat stamps, etc. Saw and file steel, and steel to order for any purposes, manufactured at their Cyclops Steel Works Sheffield.

JOHNSON, CAMMELL & CO.,

100 William St., New York.

November 23 1849.

Railroad Iron.

OF ANY PATTERN AND WEIGHT,

Of a Favorite Brand,

And deliverable in Bond, or Duty paid, at any Port of the U. S., contracted for on favorable terms, by

CHARLES ILLIUS,

20 Beaver St., New York.

Pig and other Iron also contracted for. Sole Agent for "Baxter's Machine and Burning Oil"—particularly adapted for "Railroads" and other Machinery—Preferred to Sperr by the many now using it, and 25 per cent. cheaper.

CUT NAILS OF BEST QUALITY, BAR IRON (including Flat Rails) manufactured and for sale by

FISHER, MORGAN & CO.,

75 N. Water St., Philadelphia.

Ogden & Martin's ROSENDALE CEMENT.

WE are prepared to enter into arrangements for supplying our Cement for public works or other purposes. We warrant the cement equal in every respect to any manufactured in this country. It attains a great degree of hardness, sets immediately under water, and is a superior article for masonry coming in contact with water, or requiring great strength.

For sale in tight barrels, well papered, at their office by

OGDEN & MARTIN, 104 Wall st.

February 16, 1850. 1y*

The above cement is used in most of the fortifications building by government.

To Steam Engine Builders.

THE Undersigned offer for sale, at less than half its cost, the following new machinery, calculated for an engine of 62 inches cylinder and 10 feet stroke, viz.

2 Wrought Iron Cranks, 60 inches from centre to centre.

1 Do. do. Connecting Rod Strap.

2 Do. do. Crank Pins.

1 Eccentric Strap.

1 Diagonal Link with Brasses.

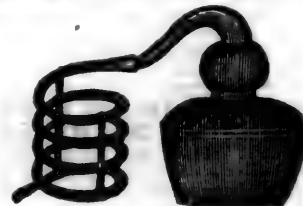
1 Cast Iron Lever Beam (forked).

The above machinery was made at the West Point Foundry for the U. S. Steamer Missouri, without regard to expense, is all finished complete for putting together, and has never been used. Drawings of the cranks can be seen on application to

HENRY THOMPSON & SON,

No. 57 South Gay St., Baltimore, Md.

Sept. 12, 1849.

**P. H. Griffin,**

Corner of Steuben and James Sts. Albany, N.Y.

CONTINUES to manufacture copper flues for locomotive boilers, brewers' coppers, stills, tanner heaters, etc. Copper work in general, at the shortest notice. He has constantly on hand brass cocks, brass valves, copper pumps of every variety.

Orders promptly attended to.

1y14

To Railroad Companies.

FOR SALE—A Second-hand Locomotive Engine and Tender, of about 10 tons weight, in good order, and warranted to perform well. Any company wanting a cheap engine for a passenger or light burden train, will rarely meet with an opportunity so favorable as the present. The engine and tender are in perfect running order, and will be tested to the satisfaction of any one wishing to purchase. Price \$1,500.

Address **J. B. MOORHEAD,**

Frazer P.O., Chester county, Pa.

P.S.—The Engine can be seen by calling on H. Osmond & Co., Car-builders, Broad st., Philadelphia.

September 6, 1849.

India-rubber for Railroad Cos.

RUBBER SPRINGS—Bearing and Buffer—Fuller's Patent—Hose from 1 to 12 inches diameter. Suction Hose. Steam Packing—from 1-16 to 2 in. thick. Rubber and Gutta Percha Bands. These articles are all warranted to give satisfaction, made under Tyer & Helm's patent, issued January, 1849.—No lead used in the composition. Will stand much higher heat than that called "Goodyear's," and is in all respects better than any in use. Proprietors of railroads do not be overcharged by pretenders.

HORACE H. DAY,

Warehouse 23 Courtlandt street.

New York, May 21, 1849.

To Railroad Companies and Contractors.

FOR SALE—Two Locomotive Engines and Tenders, at present in use on the Beaver Meadow Railroad, being too light for their coal trains, but well calculated for either gravel or light passenger trains.

They weigh, in running order, about 8 tons each—having one pair of driving wheels 4 feet diameter, 4 truck wheels 30 inches diameter, with cylinders 10 in. diameter, and 18 inches stroke of piston. Tenders on 4 wheels. Address **JAMES ROWLAND,**

Prest. Beaver Meadow Railroad & Coal Co.,

Philadelphia.

or, **L. CHAMBERLAIN,** Sec'y,

at Beaver Meadow, Pa.

May 19, 1849. 20tf

Rosendale Cement.

THE NEWARK AND ROSENDALE LIME AND CEMENT CO. are now manufacturing at their works in NEWARK, N. J., and Ulster county, N.Y., a very superior article of *Hydraulic Cement*—also Lime Calcine Plaster, etc. Contractors and dealers will find it to their advantage to call or make application before purchasing elsewhere. All communications addressed to the subscriber, at Newark, N.J., will be punctually attended to.

1y*15

HENRY WILDE, Secretary.

NORRIS' LOCOMOTIVE WORKS, SCHENECTADY, N. Y.

THESE Works are in full operation in Manufacturing to order, Locomotive Steam Engines & Tenders, of the best principle and construction of material, using wrought iron heavy frames with pedestals welded thereto, and all parts of the engine made of the best wrought iron, except cylinders, pumps and boxes—obtaining greater durability, and carrying less weight over the road, than engines constructed of cast iron.

Wrought Iron Tires made any required size, and Tire Bars bent and welded with dispatch.

Chilled Wheels for Cars, Trucks and Tenders, made from the toughest iron.

Driving and Tender and Car Wheels fitted to Axles with Brass Boxes and Springs, and Railroad Machinery generally. Manufactured and for sale by

April 11, 1849. E. S. NORRIS.

To the Proprietors of Rolling Mills and Iron Works.

THE Undersigned—Proprietors of Townsend's Furnace and Machine Shop, Albany—are extensively engaged in the manufacture of Machinery and fixtures for Iron, and Copper Rolling Mills, and Iron Works. Having paid particular attention to the manufacture of *Rolls* (Rollers), both *chilled* and *dry-sand*, they feel confident that they can execute orders for such castings in a satisfactory manner. And to give assurance of this, they beg leave to refer to the following named persons, proprietors and managers of some of the most extensive rolling mills in the country, viz: Jno. F. Winslow, J. Tuckerman, H. Burden, W. Burt, J. & J. Rogers, Salsus & Co., J. B. Bailey, L. G. B. Cannon, Hawkins & Atwater, etc., etc.

F. & T. TOWNSEND.

Albany, August 18, 1849.

Passenger Car Linings.

THE Advertiser continues to make to order the Enamelled Car Linings which have been so highly approved the last three years, and are now exclusively used by all the Northern Railroads. No pains are spared to get out new styles, and adapt them to the tastes of every consumer.

Orders addressed to CHARLES STODDER, No. 75 Kilby street, Boston, will have prompt attention. March 23, 1850. 2m

CAUTION.

RAILROAD COMPANIES and others are hereby cautioned against using or vending our improvement for easing the lateral motion as applied on Railroad Cars. Letters Patent having been granted to us in 1841, any party or parties so making or using said improvement without license from us will be proceeded against according to law.

DAVENPORT & BRIDGES.

FOWLER M. RAY'S Patent India-rubber Railroad CAR SPRING.

New York and Erie Railroad Shops,
Piermont, March 28, 1850.

This will certify that from practical experience in the use of Fowler M. Ray's India rubber Car Springs, I believe them to be far superior to any others now in use.

I have never known them to be affected by any change of temperature, as other Rubber Springs have been affected on this road.

I am at the present time repairing a Passenger Car that Mr. Ray and myself mounted with his springs about two years and eight months since.

The springs are at the present time as perfect, to all appearances, as when first applied to the car.

Respectfully yours,

HORACE B. GARDNER,
Foreman of the Car Shops.

Supt. Office N.Y. & H. R.R.,
New York, March 8, 1850.

This is to certify that we have used the Rubber Springs manufactured by Mr. F. M. Ray for the past twenty months, "both for Passenger and Freight Car Springs and Bumpers, and of different sizes," and have in every case given entire satisfaction, and I consider them the best spring now in use.

M. SLOAT, Supt.

Harlem R.R. Depot,
New York, March 7, 1850.

This is to certify that we have used Mr. F. M. Ray's India-rubber Springs for over eight months, and find them to be easy and durable, and recommend them to railroad companies as being superior to anything we have tried.

J. M. SMART,
Foreman at 42d St. Depot.

Office New Jersey Railroad Co.,
Jersey City, March 8, 1850.

FOWLER M. RAY, Esq.,

Dear Sir: In answer to your enquiries respecting the operation of the Vulcanised Rubber Springs, purchased by our company from you some two years since, I reply that they are superior to any spring in use, (that I have either seen or heard of).

The improved form of your spring, consisting of a solid piece of vulcanised rubber with bands on the outside, is far superior to your first form, consisting of disks of rubber with metallic plates interposed.

The last named form was tried, if you recollect, at a much earlier period; and then was replaced by your last form.

I have no hesitation in saying that your springs have given entire satisfaction, and most cheerfully recommend them to railroad companies throughout the country for the following reasons:

1st. The cost is 30 per cent. less.
2d. Saving of weight on each car of 8 wheels from 700 to 800 lbs.

3d. Less care and attention is required, as they are not liable to get out of repair.

4th. A great saving is secured in the wear and tear of the cars and rails from their great elasticity.

5th. The freedom from noise.

6th. There is greater safety in case of accident, as they cannot be broken.

7th. The comfort of passengers is enhanced sufficiently to pay the expense, waiving all the other reasons that I have given.

Should this fail to satisfy any person enquiring, you are at liberty to refer to me, No. 150 Washington St., Jersey City. Yours respectfully,

T. L. SMITH, Supt.

New York, March 11, 1850.

I have used the Patent India-rubber Spring purchased of Mr. Ray, upon the cars of the New York and New Haven Railroad, and have found them efficient and economical; and when applied to the axles and draw springs, believe them to be quite equal to any in use. I have found a combination of these springs with a steel spring under the transom beam a very satisfactory arrangement, and am now using this plan in all new cars.

Yours respectfully,
ROBERT SCHUYLER.

February 25, 1850.

From practical observation of the use of the India-rubber Car Springs, manufactured and sold by your company, we are entirely satisfied in their application, and do not hesitate to recommend them as elastic, durable, requiring no repairs for years, and retaining their consistency during all extremes of weather. We have applied them for the past two years, and consider them superior for all railroad purposes.

Yours truly,

OSGOOD BRADLEY, Car Builder, Worcester.
T. & C. WASON, do. Springfield.
DEAN, PACKARD & MILLS, do. do.
DAVENPORT & BRIDGES, do. Cambridgeport.

Office of the New Jersey Railroad Co.,
Jersey City, March 7, 1850.

This is to certify that we have had Mr. F. M. Ray's India-rubber Springs in constant use under our cars, and as Bumper Springs for upwards of two years, and they have in every way given perfect satisfaction.

The present form of spring we deem far superior to the form of Disk, having used both forms, although we have none of those made in Disks at present in use.

We take pleasure in recommending these springs to all railroad companies.

J. P. JACKSON, Vice Pres.
New Jersey Railroad and Trans. Co.

Roxbury, February 28, 1850.

In compliance with your request, I take great pleasure in stating the result of my experience in the use of "Ray's Patented Vulcanised India-rubber Car and Engine Springs." We have used them nearly two years, and never had one fail in any way. The cold weather does not affect them, as it has other rubber springs we have used.

With sixteen years' experience as superintendent of machinery on the Boston and Providence railroad, I take pleasure in saying that your springs are the best we ever used, or I ever saw used elsewhere. We have 20 cars rigged with them, of which I can say that the springs are as good now as when first applied. I put 24 lbs. of the rubber under the fore and end of one of our heaviest engines, taking off 250 lbs. of steel springs—it has been in use 13 months, and is in as good condition now as when first put under the engine.

Very respectfully yours,

GEO. S. GRIGGS,
Supt. of Machinery, Boston and Prov. R.R.

Fall River, February 2, 1850.

In answer to yours of the 20th ult. I would say that this company has for some 10 or 12 months past been using "Ray's India-rubber Springs." We have applied them to both passenger and freight cars with uniform success. They have invariably preserved their elasticity and consistency through all the extremes of weather; and we are now applying them whenever the steel spring fails. I am well satisfied that they are particularly adapted for railroad purposes.

Very respectfully yours,

GEO. HAVEN,
Supt. Fall River Railroad.

Jersey City, March 9, 1850.

This is to certify that the present form of Mr. F. M. Ray's India-rubber Car Spring I consider far superior to the form of Disk, having used both forms.

I take pleasure in recommending these springs to all railroad companies. DAVID H. BAKER,
Foreman of Car Shop of N.J. R.R. & Trans. Co.

Boston, March 5, 1850.

In answer to your enquiry about India-rubber Springs, I have to say that we have used them to a considerable extent on both freight and passenger cars, and also on several of our tenders; and I am very well satisfied that they answer all the purposes for which they are intended. I believe the India-rubber will soon supersede all other springs for cars and tenders.

Yours truly,
S. M. FELTON,
Supt. Fitchburg Railroad.

Old Colony Railroad Office,
Boston, March 6, 1850.

EDWARD CRANE, Esq.,

President New England Car Co.,

Dear Sir: In compliance with your request I would state that the Old Colony Railroad Company have had in use upon their road, India-rubber Springs furnished by your company, for more than eighteen months past, during which time they have been extensively used under Passenger and Freight Cars, Locomotive Tenders, and for Drawer and Buffing Springs, with the most perfect success. The elasticity and consistency of the Rubber has never been unfavorably affected by either extremes of heat or cold—and from the experience which we have had in the use of Rubber Springs, I think them well adapted for railroad purposes—and therefore we have for some months past used Rubber almost exclusively, in all places where springs are required.

Respectfully yours, etc.,

JAS. H. MOORE,
Supt. O. C. Road.

Troy, February 27, 1850.

We have been using your India-rubber Car Springs for nearly two years—and we take pleasure in saying that in our opinion the rubber has to a certain extent already, and may eventually entirely supersede all other Springs for Railroad Car purposes. We now use it entirely for Draw Springs and Bumpers, considering it better and lighter than steel.

During our two years' experience in the use of it, we have not known any to lose their elasticity, or fail in any way; and we cheerfully recommend the rubber for railroad car springs. Very respectfully,
EATON, GILBERT & CO.

To Practical Machinists.

AN excellent opportunity now occurs to a practical Machinist, of WELL ESTABLISHED REPUTATION, and some capital, to engage extensively in the STEAM ENGINE, BOILER and FOUNDRY BUSINESS.

An establishment is now ready for business, ample in all its details, including extensive wharf room, for any sized steamboats, and from its position, if properly conducted, will doubtless command a large share of business.

A practical Machinist, as a partner is required, to conduct the whole establishment; and only those FULLY COMPETENT need apply. Address (post paid) "MACHINE CO.," Box No. 741, Philadelphia, Pa. 1m14

Etna Safety Fuse.

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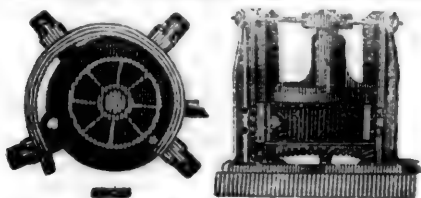
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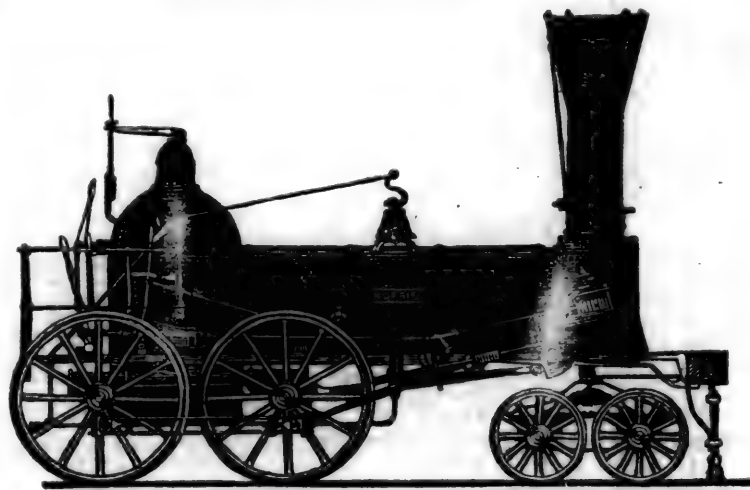
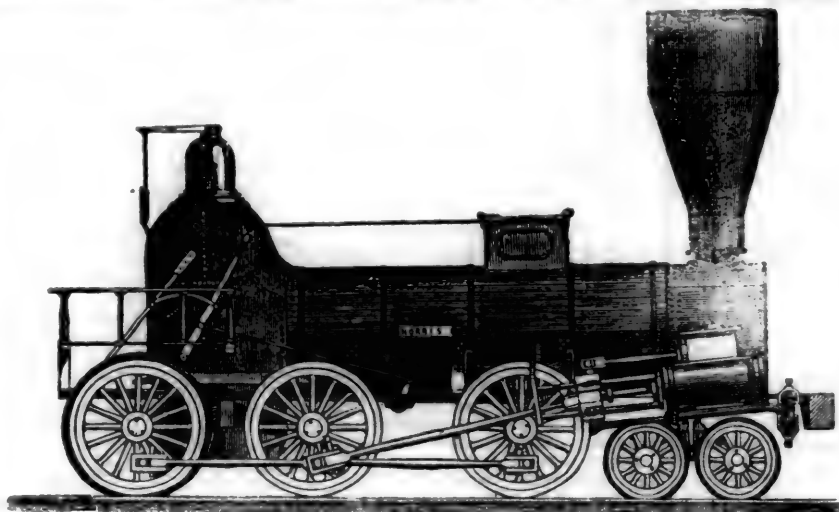
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AMERICAN RAILROAD JOURNAL.

STEAM NAVIGATION, COMMERCE, MINING, MANUFACTURES.

HENRY V. POOR, Editor.

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ASSISTANT EDITORS,

J. T. HODGE, *For Mining and Metallurgy.*

GEN. CHAS. T. JAMES, *For Manufactures and the Mechanic Arts.*

M. BUTT HEWSON, C. E., *For Civil Engineering.*

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American Railroad Journal.

PUBLISHED BY J. H. SCHULTZ & Co., 136 NASSAU ST.

Saturday, June 1, 1850.

An Essay on Pen and Pocket Cutlery,

Embracing a Detailed Description of the Mechanical, Chemical, and Manual Operations Performed on Certain Raw Materials, to Convert them into the Means, Implements, and Materials, for Manufacturing Pen and Pocket Knives.

BY A. L. HOLLEY.

Continued from page 330.

CHAPTER II.—IRON, STEEL, PROCESS OF MANUFACTURING, WOOTZ, ALLOYS, DAMASCUS BLADES, SUPPOSED METHODS OF MAKING, ANECDOTES, VARIETIES OF STEEL.

The combining volume of iron is 28, and its specific gravity when hammered 7.843. It is the most useful of all metals, and found in abundance in all parts of the world, both in the animal, vegetable and mineral kingdoms. Though not as highly malleable as silver and gold, it is exceedingly ductile, and may be drawn into wire the thousandth part of an inch in diameter. It is attracted by the

magnet, and may be made permanently magnetic in a much greater degree than any other metal.—Iron has in few instances been found in its native state mixed with some earthy substance, copper and lead. *Meteoric iron*, so called because it was supposed to have fallen from the moon or some heavenly body, has also been obtained alloyed with other metals. Native iron is usually soft, malleable and ductile, not materially differing from that reduced from ores, though it is not as liable to oxidation. Iron is reduced from ores by depriving it of its oxygen by fire. The ores, together with carbon in some form, are subjected to great heat, and the latter having a greater affinity for oxygen, the iron is reduced while the charcoal or the carbon becomes an acid or an oxide, and passes off, or as is commonly said is burned up. This operation is performed in vast furnaces, the size and working of which is probably familiar to the reader, and therefore need not be described here. The ore and coal, together with a portion of fine lime stone, which acts as a flux by combining with the clay and forming a fusible compound which runs away below in the form of cinder, are together put in the fire in "charges," and from two to six or more tons of pig iron made at a casting. Ores, in England, usually contain from 18 to 55 per cent. of iron, before calcined, or roasted. Carbonic acid and clay, and usually water, sulphur, silic, and perhaps a little arsenic, are ingredients in the composition. The ores are roasted, or as it is generally termed in this country *burned*, in kilns to free them from impurities, and lose from 20 to 30 per cent. in weight by this operation. In this country and in England from 2½ to 3 tons of ore, smelted with the charcoal of 3½ cords of wood, or nearly 3 tons 15 cwt. of bituminous coal, will make one ton of pig iron. Bituminous coal is *coked* before it is used, which will afterwards be described. A ton of raw coal will produce about 13 or 14 cwt. of coke. Iron smelted by charcoal is particularly adapted to the making of steel, but on account of the expense it is not generally manufactured in England. The texture of iron is fibrous, and is very difficult of fusion, melting at 2754° Fahrenheit, and requiring the greatest heat of a wind furnace. The two principal varieties of cast iron are *white* and *gray* iron, the former hard and brittle, the latter soft and used for making steel and such castings as require turning, drilling and planeing. Some varieties of cast iron are purer than others, some containing traces of

sulphur, phosphorus, silicium, calcium, manganese, and always carbon and oxide of iron. It is chiefly refined by a process called puddling, which consists in subjecting it to the intense heat of a reverberatory furnace, where as it melts it is gradually worked about, till it becomes less and less susceptible of fusion, and at length grows tenacious and pulverulent. The mass while stirred emits a bright blue flame, caused by the burning up of some of its impurities. The fire at length agglutinates the metal, which is immediately transferred to rolling mills, or hammered or rolled by machines into balls, and then passed through the rolling mills, where they are still further purified and formed into bars of different sizes. Both wrought and cast iron are used in the manufacture of cutlery, the former in the shape of nail rods and wire, and the latter for the making of steel and occasionally handles.—Probably the most valuable of all compounds of iron is *STEEL*, as it possesses the quality of being hardened and tempered, and is thus particularly adapted to the making of cutlery. Steel is a composition of iron and a small portion of carbon, with a slight admixture of oxide of iron, it is therefore a carburet of iron. The principal varieties of steel the art of manufacturing which is known, are blistered and cast steel. The first mentioned kind is made by the process called cementation. A furnace of conical form, with two fire brick cases, capable of containing several tons of iron, is constructed, beneath which is a long grate on which the fuel is placed. On the bottom of the case is placed a layer of pulverised hardwood charcoal, then a layer of wrought bars of pure soft iron, and thus the bars and charcoal dust alternate to the top of the furnace. Flues are also carried through, which are covered with clay to keep the furnace air tight. The whole is kept at a high temperature, usually a red heat, for eight or ten days. The carbon or charcoal is thus gradually absorbed by the iron, probably in a gaseous state. It has not been certainly ascertained whether the union of the carbon with the iron is chemical or mechanical, but it is supposed by some to be both, for the reason that the *damasked surface* of some celebrated sword blades is owing partly to a chemical and partly to a mechanical union. But this appearance may be caused by chemical changes alone, acting partially on the original carburet and depositing carbon unequally. This steel is blistered by the escape of the air and gas from the interior, and hence its

name. Towards the end of the process constant and careful watching is necessary, for by the absorption of too much carbon the bars may be suddenly fused. The progress of cementation is discovered by withdrawing and breaking a bar, called the "test bar," which must be colored alike in the centre and at the surface. When the steel is completely made the fire is extinguished and the furnace left to cool, which takes from six to eight days. These bars are repeatedly broken, welded and drawn out, till the specific gravity and fineness are increased, and great care is taken during the operation, to preserve the surface from oxidation.—Steel to be benefited by hammering should be heated to a temperature neither too hot nor too cold, for in the first instance only the shape is changed, and in the last the particles are dislocated and scaled off, but at a low cherry red the metal is condensed and thus made better. There are two methods of making cast steel. The following is the receipt of an old English steel manufacturer, viz: "Re-melt blistered steel of a proper hardness in crucibles, together with a handful of fine charcoal and 2ozs. of manganese to every 23 lbs. of metal; cast into ingots and weld and draw out until it is sufficiently fine." The other method is by melting soft iron (Swedish and Russian are the best in use) with powdered charcoal, and a flux of vitreous and carbonaceous substances in a large crucible placed in a wind furnace. When the fusion is complete, it is cast into small bars or ingots, which are subjected to the same process of repeated welding through which are passed the bundles of blistered steel.—Cast steel is harder and more elastic, it receives a higher polish, and has a much closer texture than common blistered steel.

Another mode of applying carbon is by a stream of gas, but this is not in general use. The most skilful manipulation is requisite as the point of sufficient fusion is reached, and it must be performed under severe exposure to the most intense heat.—Wootz, a cast steel from India, has been very successfully employed in the manufacture of cutlery in England, which the experiments of Messrs. Stodart and Faraday have shown to be an alloy of steel with small quantities of silicium and aluminum. Wootz is made by placing alternate layers of wood and malleable iron in a furnace somewhat resembling our furnaces for cementation, and converted into steel in the same manner that common blistered steel is made. It is then fused, and crystallises in the crucibles, in which state it is imported.—When remelted and passed through the same operations to which our steel is subjected, it is superior to all known steel. Some have attributed its peculiar virtue to its cementation being performed with wood, but it is evidently made from iron reduced from very superior ores, or owes its excellence to its being alloyed with other metals. Great care is necessary, or it is easily ruined when fused a second time. Numerous alloys of steel have been made, among the most useful of which is a compound of 500 parts steel to one of silver. If a larger proportion of silver is used it does not smoothly and evenly combine with the steel. The alloy of steel with 100 parts of platinum, though less hard, is more tough than the above compound, therefore very valuable, combining tenacity and hardness.—Steel alloyed with rhodium exceeds the two former in hardness, and compounded with osmium, palladium and iridium, is also excessively hard, but on account of the rarity and expense of these metals, it cannot be successfully applied to practical purposes.

A compound of gold and steel, is also of great utility in some cases.

As before mentioned, iron produced from meteors is less susceptible of oxidation than any other, probably owing to its combination with nickel. Perhaps an alloy made by combining these two metals might be highly valuable. The art of making steel equal or similar to the Damascus sword blades, is now lost, and was perhaps never thoroughly understood in Europe, though various explanations have been given in regard to the character and structure of these celebrated weapons. They were never known to break in battle, and always retained an edge sufficiently hard and powerful to cut through helmets, armor, and all impediments. It has been supposed, on account of their striated appearance, that they were formed by extremely thin sheets of iron and steel wound with fine soft iron wire, and welded firmly together. Some believe that they were made by winding ingots of hard steel alone with tenacious iron fiber and cementing them at a great heat, while it is thought by others that they were the product of fine iron converted into steel by the carbonic acid gas, into which diamonds turn when burned up, these being the purest carbon known. But this theory is incorrect, from the fact that diamonds were first burned by Florentine Academicians in the year 1649, and the products of this burning were first examined by Lavoisier in 1773, long after the Crusades, when Damascus blades were in use. Many persons are confident that this metal was an alloy of gold and steel, and others that it was a compound of silver and steel, the chemical and mechanical unions together causing the damasked appearance, while others affirm that they were alloys of either platinum and steel, and thus both hard and tenacious, or of palladium, osmium, or some similar metal, with iron or silver and steel. Perhaps the most probable method of constructing these blades, was by the repeated and continued hammering of hard steel of a superior quality, and soft very tough iron fiber, running in all directions, at a cherry red, till the fineness and specific gravity were greatly increased, the steel holding the edge and doing the execution, and the fibers of iron, by virtue of their tenacity, binding the whole together, and preventing its breaking.

Many anecdotes are related in regard to the wonderful powers of these and other swords, which, though we cannot listen to them with unshaken credulity, are perhaps based on truth. One only will be mentioned. Two celebrated warriors were testing the virtues of their swords. The first commanded a thick bar of iron to be laid on the block, which he cut asunder by one tremendous blow of his double handed broad sword, without breaking, bending, or injuring its edge! The other one then called for a quantity of down which he blew upwards, and as it slowly fell it was cut in two by one stroke of his scimitar. Some one has added the following supplement to this story, which though highly interesting, is hardly credible. The first general not being satisfied, the latter ordered an attendant to come forward, across whose neck he drew the back of his sword, and asked, "Did you feel that?" The servant shook his head. He then drew the edge across his throat, asking the same question. As the victim attempted to reply by the former sign his head dropped into his hands!—Steel is used for the manufacture of an almost innumerable variety of blades, which are designed for numerous and entirely different operations, and therefore various degrees of tenacity and hardness are required. The steel of a lancet must necessarily

be hard and susceptible of a fine edge, being used for purposes that require the most exact and perfect operations, consequently very brittle, while the same metal in the form of a trowel must be exceeding tenacious, or it will break in trimming bricks, but the fine edge is not at all necessary.—Probably almost every cutting instrument has some quality peculiar to itself. Pen, and the smaller varieties of pocket blades, should be hard and very fine grained, while the larger kinds should be a little more tenacious, though their thickness will usually prevent their breaking by hard usage.—Both cast and blistered steel are in constant use in the manufacture of knives, the former for blades and tools, and often for backs, springs, and other fine work, and the latter almost wholly for springs, though occasionally for handles, implements and machinery.

To be continued.

English Railways.

The past week has been an eventful era in the history of the railway share market, as marked by a greater depression in price of the principal stocks than we have ever yet had the undesirable duty to record. The Great Western shares, on Tuesday last, changed hands at 46, the lowest price ever before quoted, which shares in August, 1845, were sold at 226; while the London and North Western, Eastern Counties, South Western, South Eastern, and, in fact, shares in all the principal companies, have been in an equally depressed condition. A most extraordinary circumstance in connection with this description of security is, that even the Indian lines, with 5 per cent. guaranteed by the East India Company, can scarcely find purchasers at a trifle above *par*; while India bonds, paying out 3½ per cent. are 4½ premium, the interest on which is at any time liable to be reduced. With a population increasing at the rate of nearly 500,000 a year, or 1300 a day, provisions cheap, a rapid increase in the development of trade and commerce, and with every element which we can imagine necessary for the progressive increase of traffic and improvement of railway property in full operation, for months the fall has gone steadily on, nor is it possible for the most foresighted to foretell whether the lowest ebb has yet been reached or not. In this spirit-depressing, and, in fact, extraordinary state of railway affairs, neither directors or shareholders appear to have the slightest idea where to seek a remedy. The former, by allowing the most unreserved inspection of accounts, and other acts, may endeavor to inspire confidence, and the latter may afford it; but there appears an incubus riding on the shoulders of railway property as an investment, the nature of which is beyond the power of either party to discover.

In such a period of despondency, when forced sales of railway property are carrying broken hearts and absolute ruin into many a home, we are glad to observe that a pamphlet has just appeared from the pen of Mr. Adams, of the Fairfield Iron Works, Bow, "On Road Progress, and Practical Economy in Fixed Plant and Rolling Stock," in which the author sums up the causes of railway decline under two heads—bad legislation and bad mechanism. Mr. Adams is known as an ingenious mechanical inventor, manufacturer, and patentee, and as the author of more than one work besides the present on railway affairs; and the volume before us comes most opportunely at the moment for public consideration. The great expenses and losses under the first head are comprised in legal and parliamentary expenses cost of land and compensation, and the choice of injudicious and non-paying routes; forming together large sums, which, on all the present lines will, at no very distant day, have to be written off the accounts as profitless, or wasted capital, never to be retrieved.

Under the second head—bad mechanism—he shows how the use of disproportionately heavy engines and heavy carriages have crushed and broken up the permanent way, destroying the rails in one-fifth of the time they otherwise would have lasted, breaking down bridges, and causing endless and inordinate expense. He demonstrates that the

only way to extricate railway property from the slough of despond into which it has fallen is to give up the absurdity of heavy engines and carriages, and adopt light engines and light trains. This, he states as his conviction, can be easily effected, ensuring greater speed and safety, at one-third the previous cost, with a reduction of 50 per cent. in the working expenses; and that, by such a system, railways are capable of indefinite extension, carrying them not only within reach of every village in the kingdom, but even making them profitable in uninhabited districts, by the encouragement which will be thus afforded for more extended land cultivation. It is stated that, under the present system, the dead weight to be moved in proportion to the live, or paying weight, is 26 to 1—an enormity by itself sufficient to account for the great depreciation in railway profits.

Mr. Adams states that under his proposed plan, it would not exceed $\frac{3}{4}$ to 1; and that new double line railways can be formed with rolling stock complete, for £7,000 per mile. This view of the case is not mere theory, the advantages of light engines and trains have been substantially proved on the Eastern Counties, North Kent, Bristol and Exeter, and Cork and Bandon lines, and are supported by many of the most eminent and experienced engineers of the day. However disheartening may appear the obligation to break up the old stock when replaced by new (for it cannot be sold), and however difficult the obtaining of funds for constructing the new stock, it is everywhere apparent that, until some fundamental change takes place in the entire principle of railway propulsion, profits must continually decrease, dividends diminish, and the whole system gradually descend the stream to an ocean of bankruptcy and ruin.—*Min. Jour.*

REPORT OF THE COMMISSIONERS APPOINTED TO
INQUIRE INTO THE APPLICATION OF IRON
TO RAILWAY STRUCTURES.

Continued from page 324.

The bars which were experimented upon by transverse pressure, were of sections varying from 1 inch square to 3 inches square, and of various other sections, and the actual breaking weights show that the strength of a bar 1 inch square should not be taken as the unit for calculating the strength of a larger casting of similar metal, although the practice of doing so has been a prevalent one, for it appears that the crystals in the portion of the bar which cools first are small and close, whilst the central portion of bars 2 inches square, and 3 inches square, is composed of comparatively large crystals, and bars of 3 inches square in section, planed down on all sides alike to $\frac{1}{4}$ of an inch square, are found to be very weak to resist both transverse and crushing pressure. Hence it appears desirable, in seeking for a unit for the strength of iron of which a large casting is to be made, that the bar used should equal in thickness the thickest part of the proposed casting.

The performance of these various experiments has been greatly facilitated by the permission which was liberally granted to us by the Lords Commissioners of the Admiralty, to make use of Portsmouth Dockyard in carrying on our investigations, in addition to which, however, we found it necessary to hire for several months some premises in Lambeth. This was found requisite for the performance of those portions of the experimental inquiry which had been undertaken by Eaton Hodgkinson, Esq. Although we are aware that, to point out the labors of individual members of the commission would be impossible, and that it may appear invidious to single one out for praise, we cannot resist the expression of our thanks to the above-named gentleman, for the zeal and intelligence with which he has carried out the remarkable series of experiments which are detailed in the Appendix to this Report, and which constitute a large proportion of those which have been already described.

In addition we have obtained, from many of the iron masters, information respecting the various processes employed by them in the manufacture of their irons, and the effect of such processes upon the strength and properties of the material produced; and we have also made careful inquiries of civil engineers with respect to the qualities and mixtures of iron preferred by them, for the large castings used in the construction of railway bridges,

and to the respective properties of hot-blast and cold-blast iron; this investigation has been greatly facilitated by the liberality and candor with which these gentlemen have communicated to us the results of their experience.

As no map of the kingdom had been constructed representing the districts in which iron is found and worked, we applied to the officers of the Museum of Practical Geology for their assistance, and they caused one to be prepared expressly to accompany this report, in which the principal furnaces now in blast are shown.

Great differences of opinion exist with respect to the best qualities and mixtures of iron; and after all, it appears that those employed for large castings depend practically so much upon the commercial question of relative cost, that engineers are rarely able to select the very best material. It is generally admitted that engineers have no guarantee that the mixture for which they have stipulated in a contract shall be that used by the founder, and no certain test by which to determine whether a given piece of iron has been manufactured by hot or cold blast. A very good protection appears to be contained in the recommendation of Mr. Fox, that engineers, in contracting for a number of girders, should stipulate that they should not break with less than a certain weight, (leaving the mixture to the founder,) and cause one more than the required number to be cast. The engineer may then select one to be broken, and if it break with less weight than that agreed upon, the whole may be rejected.

At the beginning of the railway system, the bridges were naturally constructed upon similar principles to those which had been already employed for common roads or aqueducts. Some of these ordinary constructions have proved inadequate to sustain the enormous loads and vibrations of railway trains. Some have been considered too expensive; others, as the suspension bridges, have been found wholly unfitted for railway purposes. Moreover, the necessity of preserving the level of a railway as much as possible, combined with that of passing under or over existing canals, rivers, or roads, has created a demand for those forms of bridges which admit of being kept as low as possible, consistently with the proper headway or passage below; or, in other words, of making the least possible difference of level between the road or stream which the bridge has to carry and that which it has to cross.

From these causes, combined with the innumerable opportunities of building new bridges which the railways have given occasion to, and a constant endeavor to reduce the expense of building them, a variety of new constructions have been proposed and essayed, most of them of great merit and value, while others appear to be of very doubtful stability.

On the whole, the art of railway bridge building cannot be said to be in that settled state which would enable an engineer to apply principles with confidence. We have, therefore, thought it our duty to inquire into the present methods of railway bridge building, to collect in evidence the opinions and practice of the leading members of the profession of civil engineers upon this branch of construction, and especially with respect to the form and proportions of simple cast iron girders, the practical limits to the employment of such girders, the methods of combining them with the rest of the structure, the various forms of compound girders, the expediency of several combinations of wrought iron with cast iron; and, finally, the comparative merits of plain girders, and of other forms in which the principles of the arch, or other methods of giving stiffness, are introduced.

The simplest bridge, and that which admits of the greatest amount of headway at a given elevation, is, undoubtedly, the straight girder bridge.

The length of a simple cast iron girder appears to be limited only by the power of making sound castings, and the difficulty of moving large masses. Thus the practical length has been variously stated to us as 40, 50, and 60 feet. The form resulting from Mr. Hodgkinson's former experiments on this subject, is universally admitted to be that which gives the greatest strength; but the requirements of construction compel many variations from it, especially in the ratio between the top and bottom

flanges. Moreover, the convenience and the necessity of keeping the roadway for rails as low as possible, has introduced a practice of supporting the beams which sustain the rails upon one side of the bottom flange. The pressure of the roadway, and of the passing loads, being thus thrown wholly on one side of the central vertical web of the girder, produces torsion (which is not always taken into account in determining the proportions of the girder.) The existence of this torsion is admitted on all hands, and various schemes are employed to counteract and diminish it; but the form of a girder that will effectually resist this disturbing force, without incurring other evils, still remains a desideratum.

The requisite length of girders is increased by the excessive use of skew bridges; and it is much to be regretted that difficulties should often be thrown in the way of altering the course of existing roads and canals when the line of a proposed railway happens to cross them at an acute angle. Partly from these causes, and partly from a little indulgence in the pride of construction, skew bridges may be found, of which, from the obliquity of the bridge, the girders are more than double the length that would be required by the direct span of the opening to be crossed.

When the span of the opening, or other circumstances render the use of single straight girders inadvisable, straight girders built up of several separate castings bolted together, and sometimes trussed with wrought iron tension rods, are largely employed, and necessarily with great varieties of construction. By these means the girders may be extended to spans of upwards of 120 feet.

When wrought iron is combined with cast iron in the manner of trussing, several difficulties arise from the different expansions of the two metals, and the difference of their masses, which causes the wrought iron rods to be more rapidly affected by a sudden change of temperature than the cast iron parts. The constant strain upon the wrought iron tends to produce a permanent elongation, and hence tension rods may require to be occasionally screwed up. We have sought for opinions and information upon all these questions, and these show that the greatest skill and caution are necessary to insure the safe employment of such combinations.—It is not admitted that the vibration of railway trains would loosen or injure the bolts or rivets of compound girders. Nevertheless, wood, felt, or other similar substances, have occasionally been introduced between surfaces to diminish the communication of vibration.

The general opinion of engineers appears to be, that the cast iron arch is the best form for an iron bridge, when it can be selected without regard to expense or to the height above the river or road which is to be crossed. For low bridges, the bow-string girder is recommended. Lattice bridges appear to be of doubtful merit.

The latest mode of construction that has been introduced consists of boiler plates, riveted together as in iron ship building, and combined in various ways with cast iron. Hollow girders are thus formed, which are either made so large as to admit of the road and carriages passing through them, as in the Conway and Britannia bridges, or else these tube girders are made on a smaller scale, and employed in the same manner as the ordinary cast iron girders, to sustain transverse joists which carry the road. The first kind is applicable to enormous spans, those of the two bridges above mentioned being 400 and 462 feet respectively. The second kind are said to be cheaper and more elastic than other forms for spans that exceed 40 feet.

These methods appear to possess and to promise many advantages, but they are of such recent introduction that no experience has yet been acquired of their powers to resist the various actions of sudden changes of temperature, vibrations, and other causes of deterioration. We have thought it our duty to seek for information with respect to them, and we find engineers to be, for the most part, exceedingly favorable towards them, but, for the reasons above stated, we are unable to express any opinion upon them. At the same time, we desire to bear testimony to the patient care and scientific manner in which the forms and proportions of the great tubes of the Conway and Britannia bridges have been elaborated; and we must beg to refer to

the Minutes of Evidence for the details of the information which we have collected.

The investigation in which we have been concerned has made it evident that the novelty of the railway system has introduced a variety of new mechanical causes, the effects of which have not yet had time fully to develop themselves, on account of the extent and number of new railways, and the rapidity with which they were constructed—and in many cases scarcely giving breathing time to the engineers, by which to observe and profit by the experience of each successive new construction. Thus it has happened that some portions of mechanism and structure have been made too weak, or placed in unfavorable combinations; and hence some unavoidable, but most lamentable, and sometimes fatal, accidents have been occasioned. It also appears that there exists a great want of uniformity in practice in many most important matters relating to railway engineering, which shows how imperfect and deficient it yet is in leading principles.

But we have also observed throughout the present inquiry that the engineers have been already warned by experience of the necessity for increasing the strength of bridges employed in railways; and of watching more narrowly their construction, so as to render them as strong as possible. Accordingly we have found that the original structure of all those bridges which have shown the least signs of weakness, has been carefully altered and strengthened, so as to leave no apparent cause for apprehension; while in new bridges, better and stronger combinations are adopted.

And in conclusion, considering that the attention of engineers has been sufficiently awakened to the necessity of providing a superabundant strength in railway structures, and also considering the great importance of leaving the genius of scientific men unfettered for the development of a subject as yet so novel and so rapidly progressive as the construction of railways, we are of opinion that any legislative enactments with respect to the forms and proportions of the iron structures employed therein would be highly inexpedient.

We would, however, direct attention to the general conclusions we have arrived at from our own experiments, and from the information supplied to us, namely—

That it appears advisable for engineers, in contracting for castings, to stipulate for iron to bear a certain weight instead of endeavoring to procure a specified mixture.

That, to calculate the strength of a particular iron for large castings the bars used as a unit should be equal in thickness to the thickest part of the proposed casting.

That, as it has been shown that to resist the effects of reiterated flexure, iron should scarcely be allowed to suffer a deflexion equal to one-third of its ultimate deflexion, and since the deflexion produced by a given load is increased by the effects of percussion, it is advisable that the greatest load in railway bridges should, in no case, exceed one-sixth of the weight which would break the beam when laid on at rest in the centre.

That, as it has appeared that the effect of velocity communicated to a load is to increase the deflexion that it would produce if set at rest upon the bridge; also that the dynamical increase in bridges of less than 40 feet in length is of sufficient importance to demand attention, and may, even for lengths of 20 feet, become more than one-half of the static deflexion at high velocities, but can be diminished by increasing the stiffness of the bridge; it is advisable that, for short bridges especially, the increased deflexion should be calculated from the greatest load and highest velocity to which the bridge may be liable; and that a weight which would statically produce the same deflexion should, in estimating the strength of the structure, be considered as the greatest load to which the bridge is subject.

Lastly, the power of a beam to resist impact varies with the mass of the beam, the striking body being the same, and by increasing the inertia of the beam without adding to its strength, the power to resist impact is, within certain limits, also increased. Hence it follows that weight is an important consideration in structures exposed to concussions.

Whilst, however, we lament that the limited means which have been placed at our disposal, and the great time required for such investigations, have compelled us to leave in an imperfect state, or even to neglect altogether, many interesting and important branches of experimental inquiry, we trust that the facts and opinions which we have been enabled to collect will serve to illustrate the action which takes place under varying circumstances in iron railway bridges, and enable the engineer and mechanic to apply the metal with more confidence than heretofore.

WROLTESLEY.
ROBERT WILLIS.
HENRY JAMES.
GEORGE RENNIE.
W. CUBITT.
EATON HODGKINSON.
DOUGLAS GALTON, Lieut. Royal Eng'rs.,
Secretary.

Whitehall, 26th July, 1849.

From the N. O. Bulletin.

The Dimensions and Population of Cuba.

As the "inevitable destiny" of this noble island is, sooner or later, annexation to the United States, any information in regard to it is desirable, and at this time particularly opportune. The dimensions of the island have been variously estimated by different geographers, at different periods. This variance is of little moment, and is undeserving of consideration at present, particularly as we have official estimates of a late date, sufficiently accurate for our purpose.

The last statistics published by the government (in 1847) give the main island 34,233 square geographical miles, or 45,530 square English miles; to the Island of Pines, 810 square geographical miles, or 1077 square English miles; and to the other islets and keys, 970 square geographical miles, or 1290 square English miles. Total of the Island of Cuba and its dependencies, 47,897 square English miles.

To De Bow's Review, from which we derive the above statistical information, we are indebted for some additional facts. The length of the island, in the shortest line, from east to west, 680 miles. In its narrowest part, the island is 26 miles broad. In its broadest part, it is 135 miles wide. At this particular time, it is desirable to know the relative position of Cuba and its distances from other points. From the southern part of Florida to the most northern part of Cuba, the distance is 113 miles. The distance from the extreme southwest point of Cuba to the nearest point of Yucatan, is 132 miles; the eastern point of Cuba is 49 miles from the nearest point of Hayti, and the nearest distance between Cuba and Jamaica is 87 miles.

In regard to the population, the statistical information is likewise defective, but not as much so now as formerly. The returns of the white class may be relied upon, for the government has ample means to insure the correctness of this portion of the census, and its registration system, as applied to the whites, is well organized. Not so with the class of slaves—the returns are doubtless incorrect, for the interest of the planters and their fears of taxation, tempt them to conceal the real number of their slaves. With the other class enumerated in the census, there is likewise incertitude, owing to the fact that many are in the habit of enrolling themselves as white, who had previously been classed as colored.

We take the following table from an article by Mr. J. C. Reynolds, in De Bow's Review; it is constructed from official and other estimates, and may be considered authentic:

	White.	Free col'd.	Slave.	Total.
1774.....	95,419	30,615	44,336	170,370
1792.....	133,559	54,152	84,590	272,301
1811 [est].	274,000	114,000	212,000	600,000
1817.....	238,796	114,057	199,145	551,998
1825 [est].	325,000	130,000	260,000	715,000
1827.....	311,051	106,494	286,942	704,487
1841.....	418,291	152,838	426,495	1,007,624
1846.....	425,767	149,226	323,759	898,752

It will thus be seen, that while the class of whites has slightly increased, [7536 in five years] the aggregate population of Cuba has decreased. This increase of white population has been in the coun-

try, the towns and villages; while in the larger cities it has decreased. In 1841 the white population of Havana, within and without the walls, excluding the garrison, inmates of the prisons and hospitals, and transient persons, was 60,784; in 1846 it had fallen to 53,044. The total population within the same boundaries—excluding the garrison, etc., as above—in 1841, was 135,740; in 1846, only 105,751. The suburbs contained 25,010 inhabitants in 1841, and in 1846 only 23,026. The entire population thus fell from 160,750 to 128,597, or twenty per cent. In Matanzas, during the same period of five years, the white population had fallen from 10,304 to 10,039, the free colored from 3041 to 2788, the slave from 5779 to 4159, and the total population from 19,124 to 16,986.

The fluctuations in the numbers of the free population are ascribable to the cause before stated, viz: the practice of indiscriminate enrollment in one case or the other—the colored or white.

The diminution in the number of slaves, the reviewer ascribes, in part to the almost entire cessation of the African slave trade, and to the partial returns made by the planters. Making due allowances for these concessions on the part of the planters, it is estimated that 343,752 would be about the correct figures for the slaves in Cuba in 1846.

Connected with this subject, we give a brief summary of commercial statistics:

AGRICULTURE AND OTHER PRODUCTIONS OF CUBA IN 1849.

Agriculture.

Garden fruit.....	\$14,839,050
Sugar.....	13,699,924
Esculent vegetables and fodder.....	6,097,080
Tobacco.....	5,042,829
Coffee.....	2,206,131
Indian corn.....	1,884,982
Charcoal.....	1,750,110
Cedar, mahogany and other woods....	1,711,193
Molasses.....	1,462,728
Other agricultural productions.....	3,278,175

Total value agricultural productions.....\$51,972,202

Dairy and Domestic Animals.

Beef.....	\$3,605,780
Pork.....	1,346,055
Eggs.....	1,166,880
Birds.....	1,074,216
Milk.....	326,040
Hides.....	180,289
Mutton.....	120,000

Total value of the dairy and domestic animals.....\$7,819,260

Agricultural productions.....\$51,972,202

Grand total.....\$59,791,462

Exports of Produce from Havana for 1849.

	Sugar. Boxes.	Coffee. Arrobas.	Molasses. Hhds.
1847.....	644,853	326,061	32,482
1848.....	680,989	118,262	27,515
1849.....	612,801	316,246	36,256

	Cigars. Lbs.	Tobacco. Lbs.
1847.....	1,982,267	1,936,829
1848.....	150,729	1,350,815
1849.....	111,572	1,158,265

Exports of Produce from Matanzas for 1849.

	Sugar. Boxes.	Coffee. Hhds.	Molasses. Hhds.
1847.....	361,913	101,557	51,975
1848.....	313,352	8,431	58,219
1849.....	237,547	55,648	61,117

Working Railways in Belgium by Government.—

The official return of the State, which, in Belgium, construct and work the railways, has just been published, of the financial state of these undertakings up to 1st January, 1849. These returns show a sad falling off in the profits as interest on the capital expended; and notwithstanding the numerous advantages which have attended the formation of railways in Belgium, they have ever been a heavy burden on her treasury, and show a tendency at no distant day, to be a dead weight on her resources. In 1847 the gross receipts were 14,649,093*fr.*; work-

ing charges 9,318,860t.; leaving a profit of 5,030,132t.; giving an interest of 3f. 39c. per cent. on a capital of 160,181,878t.; while on the 1st of January, 1849, the gross receipts were 12,107,744f., and the working charges 8,766,241f.: leaving a net profit of 3,341,502f., or 2f. 8c. per cent. on a capital of 160,570,268f. This is a specimen of the result of working by government, in a country where, from its almost perfect level, with plenty of cheap coal and iron, railways only cost about £12,182 per mile. Our English lines, with heavy outlay, and extravagant management, have paid somewhat better than this.—*Mining Journal*.

Commerce of New Orleans.

We give below a table prepared by the Deputy Collector, showing the arrivals and clearances at the port of New Orleans for the six months ending on the 31st of March, with a statement of the arrivals and clearances of the corresponding 6 months of the previous year:

Entrances and Clearances for the port of New Orleans.

Entrances from October 1, 1848, to March 31, '49.		
No ves.	To what nation belonging.	Tonnage.
371	American from foreign ports	117,595.75
224	Foreign	146,618.28
843	America coastwise	254,654.67

Entrances from October 1, 1849, to March 31, '50.		
356	American, from foreign ports	117,719.27
264	Foreign,	133,583.80
807	American, coastwise	276,142.49

Clearances from October 1, 1848, to March 31, '49.		
355	American, to foreign ports	141,587.00
177	Foreign,	124,090.00
1030	American, coastwise	284,389.27

Clearances from October 1, 1849, to March 31, '50.		
1571	American, to foreign ports	117,637.07
268	Foreign,	71,248.73
183	American, coastwise	286,361.01

Of these, the trade to California direct and to Chagres shows the following comparative results, furnished us by the same authority:

Statement of the Clearances for California and Chagres.

From October 1, 1848, to March 31, 1849.

Chagres		California	
No.	Tonnage.	No.	Tonnage.
Schooners.. 5	660.05	5	741.56
Steamers.. 6	3,400.67	1	326.77
Barks..... 1	199.88	2	472.74
Brigs..... 4	652.08		

From October 1, 1849, to March 31, 1850.

Chagres		California	
No.	Tonnage.	No.	Tonnage.
Schooners.. 12	1,234.17	5	426.72
Steamers.. 12	10,150.39	1	136.53
Barks.... 1	199.88	11	2,717.11
Brigs..... 15	2,576.58	6	1,079.88
Ships..... 5		7	3,119.51

These tables show an increase of entrances this year, amounting to 8,587 tons; and a decrease of clearances to the amount of 74,821 tons.

The increase of Clearances to Chagres and California is 18,087 tons, leaving a deficiency for all other ports of 80,908 tons, nearly equivalent to 200 ships at 450 tons each.

By reference to the Prices Current it will be seen that the exports of cotton up to date this year has fallen off from last year's 227,953 bales, which is equivalent to an amount of tonnage about equal to the gross falling off of clearances [74,821] already expressed.

The number of vessels now in port and disengaged was stated on Thursday morning to be 143, their tonnage 68,608, capable of carrying 236,022 bales of cotton.

The stock of cotton on hand at the same day amounted to 170,092 bales.

Alabama.

Alabama and Tennessee Railroad.

We have received from Lewis Troost, Esq., Chief Engineer of the above railroad, a pamphlet containing a copy of a letter by him to the President of the above road, illustrated by a map, giving the results of a reconnaissance of the proposed route, together with various statistics, showing the resources of the country penetrated by it, together with estimates of business which the road will command, not only from the country along its line, but also from its connection with other lines of intercommunication.

In relation to the route we quote as follows:

"The proposed route of the Alabama and Tennessee river railroad, is as follows: commencing at Selma, the route passes through portions of the counties of Dallas, Perry and Bibb, to Montevallo, in Shelby county; thence it diverges north-eastwardly through Shelby and Talladega counties, to Talladega town; thence it continues through the counties of Talladega and Benton to Gadsden, in Cherokee county. Here it is proposed to connect with the Tennessee and Coosa railroad, chartered to extend from Gadsden to Gunter's Landing, on the Tennessee river.

About 26 miles of the line, commencing at Selma, and running through the valley of Beach creek, thence across the dividing ridge between Beach and Mulberry creeks, into Mulberry creek valley, were graded in 1837, and will require but little additional work to place them in condition to receive the superstructure. From the termination of the graded part of the line on to Montevallo, Talladega and Gadsden, the country presents several practicable lines through a series of well directed valleys, affording excellent routes for your railroad. At this date, we have traced two lines through from Selma to Gadsden, and I have the pleasure of informing you, that we will be able to make a cheap and effective railway, with a maximum grade of 40 feet to the mile, ascending south, the direction in which the the greatest amount of freight is to be transported.

From Gadsden to Gunter's Landing, a survey for a railroad was made in 1846, by Spencer Brown, Esq., Civil Engineer. The results of this survey are known.*

The valleys intervening between the mountain ranges of North Alabama, offer several very practicable routes for connecting your railroad with the Georgia and South Carolina railroads, and with the Middle, East Tennessee, and Virginia railroads. The two most obvious connections are,

1st. By Jacksonville to Rome in Georgia, the western terminus of the Georgia railroads.

2d. From a point near Gadsden, up the valley of Wills creek to Chattanooga, at the junction of the Georgia railroads, with the Nashville and Chattanooga railroad.

Both these connections are easy of construction, and their relative merits can only be ascertained by a thorough examination of the different routes, and a proper consideration of the relative advantages to be derived by your railroad and by the country interested in it. One or the other, or both of these connections must inevitably follow the construction of your railroad, thus completing the union of the Gulf of Mexico with the great railway improvements of Georgia, South Carolina and Tennessee."

The distance from Selma to the principal points on the line of the road are as follows:

* The Tennessee and Coosa railroad company will be organized shortly, and by virtue of an act passed at the last session of the Legislature, it will be incorporated with the Alabama and Tennessee river railroad. Thus the entire route from the Alabama to the Tennessee river, will be under one company and under one direction.

Selma to Montevallo.....	57 miles
" Coosa river.....	85 "
" Gadsden.....	160 "
" Gunter's Landing.....	200 "

From Galena to Gunter's Landing the route is not as favorable as it is below the former place, though the obstacles are not of a very formidable character. The maximum grade over this portion of the line is 80 feet to the mile.

It is well known that this road will traverse one of the richest sections of the country in natural resources. It traverses the coal, iron and limestone districts of the State. A country, the geological characteristics of which indicate it to be the deposit of the most valuable of the minerals, in addition to those above named. In relation to the coal fields of Alabama we copy the following:

The carboniferous and sillurian beds in Alabama are exceedingly rich in their useful rocks and metals.

There are four extensive coal fields in Alabama in striking distance of your railroad. They may be designated as follows: The "Tuscaloosa coal field," which is the greatest in area, lies in the valleys of the Warrior and its tributaries. The "Cahawba coal field," the southern boundary of which is at Centerville and Montevallo, occupies the valley of the Cahawba and its tributaries. The "Coosa coal field" is on the west side of the Coosa river in the vicinity of Broken Arrow creek—and the fourth coal field is in DeKalb and Marshall counties, between the Tennessee and the Coosa rivers. The coal strata on the Warrior and its tributaries, 10 of which have been discovered, are from 10 to 48 inches thick, and are slightly inclined towards the valley of the river; those on the Cahawba, are from 2 to 8 feet thick and are highly inclined, while those on Broken Arrow creek, and in DeKalb and Marshall counties, are said to be from 4 to 10 feet thick.

The coal, all of which is bituminous, of the three first mentioned fields, has proved to be of an excellent quality, having been tested in steamships, gas works, foundries, factories, &c., and from the examinations which have been made there can be no doubt of its abundance.

Each and all of these coal fields are convenient and accessible to your railroad, particularly those on the Cahawba river, and Broken Arrow creek, and in DeKalb and Marshall counties. The coal measures of the Cahawba will be in from 60 to 75 miles; of the Broken Arrow of from 120 to 130 miles; and of DeKalb and Marshall counties of from 170 to 195 miles of Selma by your railroad, with branch lines of from 5 to 15 miles long. The Warrior beds may be reached by a branch of 30 to 40 miles long, making their total distance to Selma from 80 to 90 miles.

In close proximity to the coal measures are inexhaustible and extensive beds of iron ore of the finest quality. In fact the counties of Bibb, Shelby, Talladega, Benton, Cherokee, St. Clair, Jefferson and Tuscaloosa, abound in deposits of iron ore, not excelled in richness and extent. The ore has been tested and yields an excellent quality of iron. Notwithstanding the difficulties experienced for the want of suitable means of transportation to market [the cost of transportation to a navigable river being from \$9 to \$12 per ton] the ore is manufactured into iron in several localities with profit.

Another highly important material, which abounds in localities convenient to your railroad, throughout the carboniferous and sillurian rocks, is the limestone. Some of the limestone of these beds furnish marble of excellent quality, and of beautifully variegated colors. Several varieties of blue and gray marble occur in Shelby county; in Talladega county a jet black marble; in Cherokee a buff colored marble; and in Benton county a dove colored marble, have been found. These varieties of marble take a very fine polish, dress well, and will become very useful for building and ornamental purposes. A large portion of this limestone when burned, yields quick lime, equal in strength and whiteness to the Thomaston lime.

Large beds of gypsum have likewise been found.

This article so useful in agriculture, will also swell the freight. There are other productions of these formations deserving notice, such as hydraulic limestone, mill stones, whet stones, flag stones, lead and manganese.

In the metamorphic rocks in Talladega and Coosa counties, we find a beautiful and highly valuable white marble, and granite well adapted for building. The marble quarries of Dr. Gantt, situated in the southern part of Talladega county, convenient to the projected route of your road, are particularly worthy of being mentioned on account of the pure white saccharine marble which they yield in masses of great size.

A large quantity of iron is already produced in this portion of Alabama. The great cost of transportation at the present time, is a serious check upon this business.

The coal fields of Alabama must supply the Gulf of Mexico, which is soon to become the seat of a commerce vastly greater than what it now enjoys. Our recent acquisitions on the Gulf and on the Pacific will bring into that great inland sea the commerce of every part of the world.

The agricultural capacities of Alabama are well known. On reaching the Tennessee river, the road will find an important feeder in that great stream, and when it shall connect with the roads of North Alabama, Tennessee and Georgia, it will then give to Mobile the trade of all that portion of the country to which she can lay any claim. The following are the estimates of the business of the road for one year:

WAY BUSINESS.

Down Freight.

48,000 bales of cotton as follows:	
From Benton county	10,000
Talladega	12,000
Cherokee	6,000
St. Clair and Jefferson counties	2,000
Shelby county	8,000
Bibb	6,000
Perry, Autauga, & Dallas	4,000

48,000 at 60 cts per bale.....\$38,400

20,000 bbls. of flour, at 25 cts.	5,000
60,000 tons of coal, at \$1 50 per ton	90,000
10,000 tons of iron, at 3	30,000
5,000 tons of marble, 3	15,000
50,000 bbls. of lime at 25 cts.	12,500
20,000 hogs at 75 cts each	15,000
3,000 cattle at \$2 each	6,000
5,000 horses and mules at \$3 each	15,000
2,000 tierces of bacon and hams at \$1 50.	3,000
60,000 bushels of corn and other grain at 10 cts.	6,000
10,000 bbls. of pork, beef, and whiskey at 30 cts.	3,000
Bagging and rope	3,000
6,000 tons of lumber at \$2	12,000
5,000 cords of wood at \$1	5,000
7,000 tons of building stone, mill stones, Gypsum, brick, &c. at \$2	14,000
Miscellaneous freight, tar, turpentine, wool, manufactured goods, &c.	6,000

Down way freight.....\$278,900

Up Way Freight.

20,000 bbls. of sugar at 50 cents	10,000
15,000 sacks of coffee at 50 cts.	7,500
3,000 sacks of salt at 50 cents	1,500
3,000 bbls of Molasses at 60 cts.	1,800
Miscellaneous groceries	10,000
Light merchandise, foreign imports, &c.	15,000

Up way freight.....\$45,800

Way passengers 37,500 each way averaging \$2.....150,000

Total way business.....\$474,700

THROUGH BUSINESS.

Down Freight.

50,000 bales of cotton, from North Alabama and Tennessee, including the counties of Limestone, Marion, Jackson, Morgan, Marshall, DeKalb, and Blount, in Alabama. at \$1 25	\$62,500
7,000 bbls of flour at 50 cts.	35,000
1,000 tons of iron at \$5	20,000
50,000 hogs at \$1	50,000
6,000 cattle at \$3	18,000
1,000 horses and mules at \$4 50	27,000
12,000 bbls. of Pork, beef, and whiskey at 60 cts.	7,200
5,000 casks of bacon and hams at \$2	10,000
30,000 kegs of lard at 20 cts.	6,000
200,000 bushels of corn and other grain at 10 cts.	20,000

Down Freight.....\$255,700

Up Through Freight.

30,000 bbls of sugar at 60 cts.	\$18,000
10,000 sacks of coffee at 60 cts.	18,000
5,000 bbls of Molasses at 70 cts.	3,500
Miscellaneous groceries	13,500
Light merchandise, foreign imports, &c.	20,000

Up through freight.....\$73,000
Through passengers 15,000 each way, at \$6.....180,000

Total through business.....\$508,700

Transportation of the United States Mail.....38,000

Gross receipts.....\$1,021,400
Deduct expenses, 43 per cent. 439,202

Net income per annum.....\$582,198

Equivalent to an interest of 14-55 per cent on the cost of the road at \$20,000 per mile; of 17-12 per cent on the cost of the road at \$17,000 per mile; of 19-40 per cent on a cost of \$15,000 per mile; of 24-25 per cent on a cost of \$12,000 per mile; and of 29-10 per cent on the cost of the road at \$10,000 per mile, which last is \$763 per mile more than Col. Dexter's estimate in 1837, of the average cost per mile of the road, exclusive of machinery, by the Cahawba valley route.

New Hampshire.

Northern Railroad.—The annual meeting of this corporation was held at Concord last Wednesday. George W. Nesmith, Timothy Kendrick, Joseph B. Walker, J. B. French, Wm. J. Walker, John Brewer and George A. Kettell were elected directors for the ensuing year.

Concord and Claremont Railroad.—We have received the second annual report of the above railroad corporation. The road is expected to be finished to Bradford, nearly 27 miles from Concord, next month, which has been accomplished in a little more than a year and a half, notwithstanding the difficulties of the time. The whole amount of stock issued and contracted for is \$260,000; the total cost of the road has been \$398,075, and it is recommended that the capital stock be limited to 400,000, which will finish and equip the road to Bradford. The debt of the company will consequently be nearly \$140,000, which may be reduced to 100,000 by the sale of property and collection of dues. The stockholders are reminded of the necessity of providing for this debt, either by subscribing and paying for sufficient stock to make up the deficiency, by issuing preferred stock, or by issuing mortgage bonds, to the extinguishment of which all income of the road should be appropriated. The directors speak well of the prospects of the road, and

state that the net income from the running of the road eight months to Contoocokville, and seven to Warner, is \$12,035—more than six per cent. on what will be the cost of the road to Warner.—*Boston Courier.*

Ashtabula Railroad.—This corporation held their annual meeting at Winchester, N. H., on 14th ult. The engineer reported the grading of the entire line far advanced, that the road would be opened from Keene to West Winchester, 15 miles, in August—and the whole road from South Vernon to Keene may be finished as soon as the bridge over the Connecticut can be completed, probably in November. Messrs. Benjamin F. Adams and John H. Fuller of Keene, John Stratton of Swanzey, A. Hammond of Winchester, Wm. Haile of Hinsdale, Cephas Root of Greenfield, and Philip Ripley of Hartford, were elected the board of directors for the coming year.

Cheshire Railroad.—The fifth annual report of the Cheshire railroad company gives the annexed exhibit of the operations and affairs of the road up to and on the 1st of May, 1850:

Capital Stock.

The whole number of shares issued, on which assessments have been paid in full is.....16,195
The number issued in payment of dividend Jan. 1, 1850.....181
Number on which nothing, or part only, is paid, and which have been created and not disposed of.....624
17,000

Of these 11,009 shares paid in full, have been issued at \$100 per share, and 5,367 shares at \$75.

The total amount received on the above is.....\$1,510,344 50
Amount still due.....29,005 50

Construction Account.

The amount received into the treasury to May 1st, exclusive of earnings, was—
From stock.....\$1,510,344 50
From bonds.....630,700 00
From bills payable.....534,632 88
\$2,675,677 38

The disbursements for the same work were—
For construction of the road, masonry, grading, superstructure, land damages, etc., road furniture, salaries, and incidental expenses.....\$2,345,714 28
Interest, dividends, bond warrants and loss on bonds.....257,698 17
Fuel, transportation of merchandise, repairs, etc. prior to May 1, 1849.. 29,045 07
Advances made to contractors.....30,000 00
\$2,662,457 52

The length of the road is 54 miles, maximum grade 59½ feet, and shortest radius of curvature 955 feet. The whole number of passengers carried over the road during the year was 99,510; whole number carried one mile 2,262,192.

Income.

From passengers during the year ending April 30th, 1850.....\$79,357 38
Freight.....91,138 03
Mails, express, etc.....8,295 22

Total expenditures for operating road. 73,844 43

Balance.....\$104,946 20

There have been paid during the year—
For interest on loans.....\$40,617 82
" bonds.....22,818 50
For dividend, Jan. 1, 1850, in stock.... 40,462 00

\$103,898 32

The comparative receipts for the four months in 1849 and 1850 were as follows—

	1849.	1850.	Increase.
January.....	8,592 84	12,774 45	4,191 61
February.....	9,193 72	12,374 37	3,180 65
March.....	10,881 74	14,071 53	3,189 79
April.....	11,407 49	14,672 53	3,265 04

\$40,065 79 \$53,892 88 \$13,827 09

The report proceeds to give a detailed account of the persons employed and the salaries paid to each, together with a statement of the property of the company, all of which we omit as being of minor interest.

Indebtedness and Available Means.

The company owe in bonds.....	\$630,700 00
In bills payable.....	534,632 88
In cash payable at sight, and dividends uncalled for.....	9,955 30
	\$1,175,288 18

The means of the company in cash, notes, stock, rails, amounts due from other roads, real estate, etc., amount to..... 126,264 56

Balance\$1,049,023 62

In the aggregate the total amount of capital invested in the road is given as \$2,693,543 12.

Boston, Concord and Montreal Railroad.—A large meeting of the stockholders of this road was held at Meredith Bridge on Wednesday last. The Gazette of that place states that "there seemed to be but one opinion in regard to the extension of the road to Wells river, and that was, it must be done whenever new stock could be disposed of for that purpose, or money obtained on sufficient length of time and at a fair rate of interest. It was also thought that expenses might be considerably reduced, and that the earnings of the road should be divided among the stockholders." The following ticket for board of directors was agreed upon to be supported at the annual meeting to be held at Plymouth on the 28th: Josiah Quincy of Rumney, Ira Goodall of Bath, James M. Whiton and Peter Clark of Boston, Dr. Farley of Manchester, John Eastman of Concord, Woodbury Melcher of Gilford was also nominated but declined. Messrs. Clement, Lyford and J. L. Clark, of the present board declined serving another year.

Massachusetts.

Boston and Worcester Railroad.—The annual reports of the Boston and Worcester railroad Co. show that from 1842 to 1849, the length of the road and branches increased from 45 miles to 60 miles, and the cost from \$2,764,396, to \$4,908,332. The receipts, in the meanwhile, increased in the same ratio. The comparative growth of the passenger and freight expenses and receipts will be seen by the annexed table:

Year.	RECEIPTS.		Mails, rents, &c.	Total.
	Passengers.	Freight.		
1842.....	\$186,610	\$148,188	\$14,408	\$349,206
1843.....	207,267	162,656	13,444	383,367
1844.....	234,633	175,996	10,783	426,413
1845.....	241,219	233,535	12,732	487,486
1846.....	279,793	960,165	14,754	554,712
1847.....	304,580	374,663	42,927	722,170
1848.....	332,886	859,073	24,325	716,284
1849.....	330,606	331,338	41,417	703,361
	Expenses & repairs.		Net income.	Net income per ct. cost.
1842.....	\$178,510		\$170,696	6.20
1843.....	190,549		192,818	6.80
1844.....	231,249		195,464	6.73
1845.....	243,729		237,727	7.40
1846.....	286,876		267,836	7.68
1847.....	381,986		340,184	8.27
1848.....	381,918		334,366	7.88
1849.....	405,551		397,810	6.07

The number of miles run has increased from 241,319, to 460,988. The number of passengers from 470,319, in 1846, to 959,537 in 1849; the tons of freight from 179,325 to 248,768.

Finances of Maine.

The report of the State Treasurer of Maine exhibits the operations of the Treasury for the year, and its present fiscal condition, as follows:

Amount of receipts from May 1, 1849, to April 30, 1850, inclusive.....	\$525,688 26
Balance of cash in the Treasury, May 1, 1850.....	70,638 26
Total.....	\$604,726 52
Amount of expenditures from May 1, 1849, to April 30, 1850, inclusive.....	\$478,802 40
Leaving a balance in the Treasury April 30, 1850, of.....	125,924 07
Total.....	\$604,726 52

The liabilities of the State are \$1,032,962, of which \$854,750 is funded debt. The resources of the State are \$819,267.

U. S. Mint.

The following table shows the amount of California gold received at the Mint up to the given dates:

Total receipts up to May 1, 1850, at the Philadelphia & New Orleans Mints.....	\$13,875,452
Receipts at the Philadelphia Mint from May 1 to May 14, 1850.....	1,550,000
Total.....	\$15,425,452
Estimated receipts at the New Orleans Mint.....	250,000

Grand total.....\$15,675,452
It would appear by the amount received in May at the Mint, that the quantity of gold reported as received by the last three steamers was exaggerated.

North Alabama and Savannah.

We had yesterday the pleasure of conversing with Mr. Patterson, a merchant of Decatur, North Alabama. Mr. P. is almost the pioneer of business relations between this place and that region. He brings for himself and friends nearly 500 bales of cotton to this market, taking back supplies. This cotton was received at Decatur, (which town is 200 miles below Chattanooga, just above the "Muscle Shoals,") principally from the counties of Morgan and Lawrence. A small part of it came from Elk river. Heretofore this cotton went to Florence, below the Muscle Shoals, and thence to New Orleans. Now, since the State road is opened to Chattanooga, the tide is turned the other way, and the trade of Decatur is increased two fold beyond the last season. Of the 200,000 bales made in N. Alabama, Mr. Patterson estimates that one half will henceforth come to the Atlantic markets.

From Decatur to Knoxville is 400 miles of navigation. Nine steamboats are now engaged between these two points, and three new ones are being made at Pittsburg. One boat, the James Jackson, of the capacity of 1,000 bales of cotton, 185 feet long, passes through "the suck" and other obstructions between Decatur and Chattanooga without the aid of tow lines. They go from Memphis to Washington City, via Decatur, in seven days.—When the Memphis road is done, the time will be reduced to five days.

We might have added to those details, that since the opening of the Tunnel on the State road, the travel has received a sudden and remarkable impulse. The revelations already made both with reference to trade and travel, show that our great

State work is going to have enough to do; and that, as we have always insisted, it will pay a large profit to the State. A friend of ours, just from Chattanooga, states that the shores there were lined with cotton. He estimates that there were 1,500 bales on hand there a few days since, and he conversed with two planters on their way to Savannah with their crops. The stores at Chattanooga, he adds, were full to repletion with Tennessee flour, corn and bacon, awaiting transportation; and among other articles he counted one hundred boxes of window glass, made in Tennessee, and destined for Georgia markets. While he was there, boats were arriving daily from Knoxville and Decatur, and bringing on an average twenty passengers each. Forty passengers left Chattanooga to come down in the same train with him.—*Savannah Republican*.

STEAM ABOVE THE FALLS.

The new steamer intended for the trade above the Falls of St. Anthony, is rapidly progressing. The keel is now being laid, and she will be launched as soon as the river is clear of ice. The master ship carpenter, having charge of her construction, arrived at the Falls last week, and entered upon the discharge of his duties. He hails from Bangor, Me., and is said to be a highly skilful workman.

The dimensions of the craft are 108 feet keel, 120 feet deck, 25 feet beam, and will draw 12 inches light. The machinery is in course of construction at Bangor, and will be here by the opening of navigation.—*Minnesota Chronicle*.

We know of nothing calculated to give a better idea of the magnitude of this country and of the ease with which the most distant parts communicate with each other, than the fact stated above.—Maine and Minnesota occupy the extremes of the Union, and by way of the Mississippi river are distant about 5000 miles, yet the machinery for the first steamer we believe ever built above St. Anthony's Falls is manufactured in Bangor, in the former State.

Rhode Island.

Providence and Worcester Railroad.—The fifth yearly meeting of the stockholders of this road was held at Providence on Monday, the 20th ult., to receive the report of the directors; by which it appears that the construction and equipment account up to the 1st of May, 1850, amounted to \$1,954,390 14, the capital stock \$1,457,500, bonds \$424,000. The balance outstanding against the company on the 1st of May was \$36,799 19, which is now due by the corporation in bills payable. The meeting resolved that the construction account shall be closed on it reaching the sum of \$2,000,000; that the directors be empowered to apply to the State for leave to issue bonds of the company, payable in five years or less, for \$500,000 at 7 per cent. to be secured on mortgage; and that a committee of seven stockholders, not being directors, be appointed to investigate and report on the cause of the original estimate of \$1,000,000 for the construction of the road having been exceeded. The committee was appointed to consist of Messrs. C. Robinson, Wm. Sheldon, D. Hill, Isaac Davis, L. P. Child and G. L. Dwight, who are to report to an adjourned meeting. The President, Orray Taft, Esq., was re-elected.

Value of American Gold in London.—American gold in England is equal to sterling exchange at 11½ per cent., 10,000 eagles, costing in New York on ship board \$100,510, 50 are worth in London £20,352 15s. 7d., which amount drawn at 60 days to produce the \$100,510 50, equals an exchange of

one of the leading States in the Union in every respect.

Wisconsin possesses great commercial facilities. Her western boundary is washed by the Mississippi river, and her eastern by Lake Michigan; while her interior is penetrated by the Wisconsin and Fox rivers, which with some improvement can be made navigable to a very considerable extent.—The two rivers are now being connected by a canal, so that steamboats can pass from one to another—thus forming a direct line of steamboat communication between the lakes and the Mississippi. The length of this canal is to be only about two miles.

But the great want felt in Wisconsin are good roads; in other words, of *railroads*. The soil of that State, like that of all of the Western States, is poorly adapted to the formation of a good road bed. McAdamized roads are very expensive from the absence of suitable rock formations, while railroads can be built at the lowest cost, from the level nature of the country, and the abundance of all the necessary material but iron. A good railroad penetrating any section of it, would at once double its exportable products. And if railroads in N. York and New England, costing \$50,000 per mile, pay a fair income upon their cost, what would a Wisconsin road pay which would not cost a quarter as much, and at the same time, running through a country of vastly greater resources. In addition to the superiority of Wisconsin in these respects, it must be borne in mind that the pursuits of her people at present are entirely agricultural; and that consequently they must export over their roads all their surplus, and import over them all they consume, that their own farms do not produce.

The New York end of the Troy and Greenfield railroad, from Troy to Pownal, Vt., a distance of thirty six miles, has been put under contract, for \$720,000, to be paid \$400,000 in cash, \$200,000 in stock, and \$120,000 in bonds. This contract includes land damages, and everything but the furniture of the road. The latter is estimated at \$130,000, making the entire cost of the road in running order, \$850,000. The road is to be finished by the first of July, 1851. Measures will be taken, we presume, to complete the road at the same time, as far as North Adams.

South Carolina.

Kings's Mountain Railroad Company.—The object of this company is to build a railroad from Yorkville in York district, to Chesterville, a distance of about 25 miles, there to connect with the Charlotte and South Carolina railroad. The company was organized on the 13th ult. by the choice of the following officers, viz:

President,

WILLIAM WRIGHT.

Directors.

John H. Adams,	W. C. Beatty,
S. E. Bratton,	John B. Hunter,
Wm. A. Latta,	John McGill,
John S. Moore,	John M. Ross,
C. P. Sandifer,	George Steele,
Wm. J. Wilson,	Samuel Wright.

York district lies upon the north line of the State far removed from the good navigable water courses, and a railroad will prove to it a great desideratum in opening a cheap communication with the seacoast and a market. The whole amount of subscriptions is now \$115,000, but the work will not, we understand, be commenced until a sufficient amount to complete it is secured.

We presume that, from the nature of the country, the road can be cheaply built, and that the sec-

tion interested in its construction is well able to complete it without aid from abroad. When completed it will form a valuable auxiliary to the road below, and it will be very likely in time to find its way into North Carolina, and open an outlet to that secluded part of the State.

Blake's Patent Fire-Proof Paint.

It is now more than six years since this singular substance was discovered by the patentee, William Blake, Esq., since which time it has been used extensively throughout the United States in covering all descriptions of buildings, either brick or wood; and for roofs, either shingle or tin, there is nothing equal to it. So well does it protect everything covered with it from the action of fire and weather—time and the elements tending only to harden it—that in Akron, Ohio, where it is best known, and where its fire-proof qualities are appreciated, the insurance companies, as we have been informed, have given notice that they will insure buildings covered with it at a much less premium than those covered with tin or zinc, as it has been tried in several fires there and stood much longer than either. After it has been applied a few months it acquires the hardness of slate or stone—thus forming a complete “coat of mail.” It will be found useful for railroad depots, bridges, steamboat and car decks, and for all kinds of iron, as it forms a coating nearly as hard as the iron itself, and never *cleaves off*. There is said to be an amount of worthless counterfeit stuff in the market, but as it does not answer the purpose intended, besides being an infringement of Mr. Blake's patent, we would advise all who wish to purchase to go directly to the General Depot, No. 84 Pearl St., New York, where all orders are received and promptly executed.

Commerce of New York.

The following is a comparative statement of the imports at this port, for the first quarter of the years designated:

	1848.	1849.	1850.
Dutiable.....	25,360,729	24,785,563	23,999,503
Free.....	3,318,492	2,817,728	4,387,328
Total.....	\$28,679,221	\$26,603,291	\$29,386,836
Duties received	6,214,484	5,991,816	6,996,656

Pennsylvania.

Lehigh Navigation Co.

The annual report of this company states that 801,246 tons of coal were shipped during the year, of which 379,285 tons were from the company's mines. The aggregate shipment exhibits an increase of 120,500 tons over the previous year. Of the above aggregate, 116,830 tons were disposed of on the line of the company's canal; 103,482 tons entered the Morris canal, and 580,934 tons went into the Delaware division. Of this last quantity, 105,000 tons passed into the feeder of the Delaware and Raritan canal, by the outlet lock near New Hope. From the company's Tamaqua mines, the yield for the year was 14,522 tons. The lumber shipped on the canal amounted to 33,868,816 feet, being an increase of 1,792,635 feet over the shipment for the year 1848. The company's business for the past year has proved much more productive than it did in the year 1848. The toll account for 1849 shows an improvement of \$44,407; the profits on coal exceed those of the year 1848 by \$59,998; and the profit and loss account for 1849 is better than that for 1848, by \$121,922. The indebtedness of the company on the 1st of January, 1850, was less by \$259,425 than it was on the 1st of Jan. 1849. The production of coal the present season the re-

port estimates at not less than 900,000 tons, and may considerably exceed this estimate.

Memphis and Charleston R. R. Co.

This company was organized on the 29th of April by the choice of the following gentlemen as directors, viz: James C. Jones, R. C. Rinkley and Daniel Looney of Tennessee; Judge Clayton of Mississippi; George P. Beirne and Robert Fearn of Madison county; Wm. A. Austin of Jackson co., R. M. Patton of Lauderdale co., and J. C. Goodloe of Franklin co., Alabama.

The report of the commissioners to receive subscriptions of stock was presented; from which it appeared that about \$1,200,000 had been subscribed, and upon the greater portion of which fifty cents per share, or two per cent. had been paid.

C. F. M. Garnett Esq., now Chief Engineer of the Virginia and Tennessee Railroad, has been chosen Chief Engineer of the above work. We have not learned whether he has not accepted the office.

Gov. James C. Jones has been chosen President of the company. This position was assigned to him not only by the unanimous voice of the directors but of the whole community interested in the work, and is justly due to his eminent services in its behalf.

From the liberal means provided with which to commence the work, the wealth of the country to be traversed by it, and from the character of those interested in its direction, we confidently expect to see it energetically prosecuted and completed at an early day. It is a work of the first magnitude, of great importance to every part of the country, and its completion will form a new era in the progress of the South.

United States Railroad Guide for May, 1850.

We have frequently had occasion to examine this “guide,” and find it to be very accurate—embracing all the roads in the country, and containing official tables, with hours of departure of trains, stations, miles, fares, time, etc., on all the railroad and principal steamboat lines in the United States; and other valuable matter for the travelling public. It is published in a neat and convenient form, and the number for May contains a map of the railroads in New England, and also of New York city. It is published monthly by Geo. R. Holbrook, and is for sale at 114 Nassau Street, New York.

Pennsylvania Railroad.

The subscriptions to the stock of this important work, have been increased during the last two weeks, two hundred and fifty thousand dollars. It only requires additional subscriptions to the amount of \$375,000 to complete the road between this city and Pittsburgh. This sum will no doubt be raised in a short time, as the earnings on the road, which will be completed next week to Huntingdon, a distance of 204 miles from this city is about five per cent on the total cost of construction. In all September next the road will be completed to Hollidaysburg, where it will connect with the Portage road, 36 miles, over the Allegheny mountains, leaving a distance of only 76 miles from Johnstown, the western termination of the road to Pittsburgh, to be completed. Of this distance 15 miles eastward from Pittsburgh is now partially completed.

Thus far the work has progressed with great rapidity and has been completed in the best and most substantial manner within the estimates of the Chief Engineer, J. E. Thomson. Next fall it

benefits expected to be derived from this road even in its incomplete state will begin to be felt in the vastly increased amount of business done upon the road.—*Phil. Com. List.*

New York Ocean Steam Marine.

The following names and figures will enable the public to form some idea of the number of ocean steamships now building in this city and its suburbs, or in process of completion, together with their cost and tonnage. It will be found tolerably accurate:

Names.	Agents or Owners.	Ton.	Cost.	Desti- nation.
Pacific,	E. K. Collins,	3500	\$650,000	Liver [pool.
Arctic,	do.	3500	650,000	"
Baltic,	do.	2500	650,000	"
Franklin, Fox & Livingston		2500	350,000	Havre
Havre,	do.	2500	450,000	"
Florida, Samuel Mitchell,		1200	200,000	Sav.
Louisiana,	do.	1200	200,000	"
S. Francisco, J. Howard & S.		2000	300,000	Pacific
(Not named) Morgan & Harris.		1200	150,000	Gulf [trade.
do.	do.	1200	150,000	"
Columbia, Howland & As-		800	120,000	[gon. Ore-
(Not named) Spofford & Ti-		1300	200,000	ton. Cha's-
do.	C. Vanderbilt,	1400	175,000	Pacific
New York, Wm. H. Brown.		700	100,000	Sacra- mento.
(Not named) do.		700	100,000	"
do.	Nor. & Wor. RR.	1200	150,000	L. I. [Sound.
do.	Davis & Brooks,	1400	225,000	Pacific

Number of steamships, 17; aggregate tonnage, 23,450 tons; cost, \$4,820,000. Eleven of the above vessels are on the stocks. The remaining six have been launched, and with the exception of the Pacific, are at the different iron works taking in their machinery. The whole number will be finished and despatched to their destination in the course of the present year.

The "San Francisco," alluded to above, was commenced a short time since by Messrs. Perrine, Patterson and Stack, for T. C. Larkin, Priest, &c. representatives of the California Mail Steam Ship Co., of whose line she will be the pioneer. It is intended that she shall be one of the best built and strongest fastened vessels constructed at this port. Her extreme length will be 242 feet, and she will register about 2,000 tons. She will be furnished with double engines, having 80 inch cylinders and 8 feet stroke. She is expected to be ready for sea in January next. Other vessels for this line will probably be contracted for soon.

Louisiana.

Levee Railroad.—The citizens of New Orleans are discussing the proposition of constructing a railroad upon the Levee for the purpose of removing merchandise from one part of it to the other—thus dispensing with drayage, which is at present so costly an item among the port charges of the city. There are now 5000 drays in use there, at an annual expense of \$1000 each, making an aggregate of \$5,000,000 for this item alone.

In relation to this work the Crescent City says: "The proposed road was to have a double track; it would cost \$100,000; 100 cars would cost \$12,000; 150 mules, harness, etc., \$30,000. The capital invested would be some \$150,000. About 150 men would be employed in loading and unloading at the depots, while gangs of eight or ten would be required at each of the principal streets. Besides this, quite a number would be employed as watchmen. The road would save a very large amount now expended on the Levee for paving. The increased facilities and diminished cost of transportation would add to the amount of produce brought here. It was a well known fact that the expense of loading and unloading ships here was twice as heavy as in London, which was the most expensive city in the world except New Orleans.

The result was that produce was seeking outlets in every direction, in preference to the natural one of the river.

Last year about 50,000 tons of produce had been taken by small boats up the Illinois river and canal to the lakes, and so to N. York. This year it was estimated that the quantity would be doubled. All lost to New Orleans by the heavy charges."

New Jersey.

We learn that the Camden and Amboy, and Delaware and Raritan Canal are about to make a dividend out of the additional value given to the works by the improvements they have received.

The directors report that they have, in the course of the last ten years, expended various sums, taken from the current receipts, in adding to, enlarging and improving the canal and railroad, and in enlarging their original stock of steamboats, cars, engines, etc., to the amount in the aggregate of about \$830,000. The stockholders have passed resolutions directing the board of directors to divide this amount in bonds among the stockholders. The directors will, therefore, soon divide these bonds among the stockholders. The dividend will amount to about \$20 on each share of the canal company, and the Camden and Amboy, and Philadelphia and Trenton railroad companies. The State of New Jersey holds 2,000 shares of the stock of these companies. Her dividend will, therefore amount to \$40,000. About ten years ago the companies made a similar dividend of about \$8 50 a share.

Stickney & Beatty, DEALERS IN IRON AND IRON MANUFACTURERS.

AGENTS for the Balt. City Rolling Mill, from which establishment they are prepared to furnish Ellicott's round, square, and flat bar iron, puddled and charcoal boiler plates and billet iron—also agents for the sale of the Laurel and Maryland (Balt.) charcoal forge pig irons, Balt. hard iron for chilling wheels, anti-Eaton nails, Catocoin foundry iron, boiler blooms from the Caledonian works, Wm. Jessop & Son's cast steel, Coleman's blister steel and nail rods, hoop, band, sheet, oval and common English iron.

Nos. 18 and 20 South Charles st., Baltimore.

A young man of experience in Surveying wishes a situation on a Railroad as an Assistant. Please apply at this office.

To Railroad Companies.

FOR SALE—A Second-hand Locomotive Engine and Tender, of about 10 tons weight, in good order, and warranted to perform well. Any company wanting a cheap engine for a passenger or light burden train, will rarely meet with an opportunity so favorable as the present. The engine and tender are in perfect running order, and will be tested to the satisfaction of any one wishing to purchase. Price \$1,500.

Address J. B. MOORHEAD,

Frazer P.O., Chester county, Pa.

P.S.—The Engine can be seen by calling on H. Omond & Co., Car-builders, Broad st., Philadelphia. September 6, 1849.

India-rubber for Railroad Cos.

RUBBER SPRINGS—Bearing and Buffer—Fuller's Patent—Hose from 1 to 12 inches diameter. Suction Hose. Steam Packing—from 1-16 to 2 in. thick. Rubber and Gutta Percha Bands. These articles are all warranted to give satisfaction, made under Tyer & Helm's patent, issued January, 1849.—No lead used in the composition. Will stand much higher heat than that called "Goodyear's," and is in all respects better than any in use. Proprietors of railroads do not be overcharged by pretenders.

HORACE H. DAY,

Warehouse 23 Courtlandt street.

New York, May 21, 1849.

Spikes, Spikes, Spikes.

ANY person wishing a simple and effective Spike Machine, or a number of them, may be supplied by addressing J. W. FLACK, Troy, N. Y. March 6, 1850.

Lovegrove's Patent Cast Iron Water and Gas Pipes.

THE Subscriber, the Inventor and Patentee of the Centrifugal mode of giving form to metallic substances while in a molten state, is preparing to make Cast Iron Water and Gas Pipes, of any dimensions, at prices much lower than they can be made in the old manner, and the pipes warranted to stand a pressure of three hundred pounds to the square inch, and to be soft enough to drill. Steam Engines and all kinds of machinery. Cast Iron Doors and Frames, and Mill Castings of every description, made to order.

THOMAS LOVEGROVE,

Machinist and Founder,

West Falls Avenue, below Pratt st., Baltimore.

Theodolite for Sale.

A FIRST RATE 5 INCH THEODOLITE for sale at a bargain. Enquire at the Railroad Journal Office. 2. 22*

American Railway Guide, AND POCKET COMPANION FOR THE UNITED STATES;

CONTAINING Correct Tables, showing the time for starting of trains from all stations, distances, fares, etc., on all the Railway lines in the U. States; also many of the principal Steamboat and Stage routes—accompanied by a complete RAILWAY MAP. Price, single copies 12 1/2 cts., or \$1 per annum. Published on the first of every month, corrected from returns furnished by the Railway Superintendents throughout the Union.

This book has been compiled somewhat on the plan of Bradshaw's Guide, with such improvements in size, form and arrangement as have seemed desirable; and the publisher confidently hopes it will not be found liable to the objections of incompleteness and incorrectness, which have been made, and justly too, against various other similar works heretofore issued.

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Notice to Contractors.

PROPOSALS will be received at the Office of the Morris Canal and Banking Co., Jersey City, till the 1st day of June next, for the Grading, Masonry and Timber work for ten inclined planes on the western division of said canal, to be constructed on the same plan as Plane 6, west. Plans and specifications will be ready at the said Office and at the Office of the Assistant Engineer at Mansfield, Warr'n Co., on and after the 25th inst. Contracts to be entered into, and the work commenced immediately after the letting.

On the 30th instant the water will be drawn out of the canal at the head and foot of Plane 6 west, from 10 o'clock A.M. till 3 P.M., to give contractors an opportunity to examine the work to be constructed in the bottom of the canal.

The most satisfactory testimonials of character and responsibility must accompany the bids, and bidders are requested to state what other work, if any, they are engaged on, and the time when such work will be finished. W. H. TALCOTT, Supt. and Eng. Jersey City, May 14, 1850.

Great American Engineering

AND MECHANICAL WORK, just published in a medium folio, 75 cts. to Subscribers, One Dollar to non-subscribers.

Part V of "Specimens of the Stone, Iron and Timber Bridges, Viaducts, Tunnels, &c. &c. of the United States Railroads." By George Duggan, Architect and Civil Engineer.

The present part contains beautifully executed plans, elevations and sections of the Timber Viaduct across the Canewacta Creek at Lanesboro', Pa., and the Details of the Starucca, (stone) Viaduct near Lanesboro', Pa., on the line of the N. Y. & Erie R. R.

N.B.—This work is published by subscription of the most eminent in the engineering profession of the U. States, and will be completed in 12 parts, at 75 cents each to those who remit their names and subscriptions before the 1st June next—when the first 6 parts or one half of the work will be published—after which the price will be raised to \$1 per part.

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In connection with this subject (Iron Railroad Structures) we take occasion to call attention again to Mr. Duggan's valuable and expensive publication, exhibiting drawings, with full descriptions of the various stone, iron and wooden bridges, viaducts, tunnels, culverts, etc., of all the Railroads in the United States. Mr. Duggan is an accomplished Architect and Civil Engineer, who came from Ireland to it is country to exercise his profession; but finding Railroad construction here, in many respects, different from that he had been accustomed to in Europe, he applied himself to the study of our system; and the fruits of his researches and investigations embodied in this work, are well calculated to meet the exigencies of engineers, and to assist draughtsmen, bridge builders, mechanics and students.—[N. Y. Journal of Commerce, Feb. 14, 1850.]

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CERTIFICATES.

Providence, March 22d, 1850.

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Gentlemen: We have given your machine oil a thorough trial, and find that it possesses all the qualities that we could wish, as it works better than any sperm oil we have ever used. Our shafts that required oiling four times a day with the best sperm oil that we could get, work equally as well by the application of your oil twice a day, and your oil stands cold weather much better than any oil we have ever used. Our engineer having had years' experience in running and making engines, we put great confidence in his judgment, and he gives it as his opinion that your oil is fully equal to if not better than any he ever used; and we shall soon give you an order for more, as we do not want any other kind of oil as long as we can get yours.

Very respectfully yours,

JACKSON, CLARK & CO.

Bridgeport, Nov. 7th, 1849.

Messrs. Robbins, Langdon & Co.,

Gentlemen: After about three months' trial of your oil, I have come to the conclusion to use it entirely on the engines on the New York and New Haven and the New Haven and Northampton Railroads for the following reasons:

1. It wears quite as long as sperm oil.
2. So far as I have tried it, it keeps the Journals equally cool as sperm oil.
3. I have no complaint from our men about cleaning the engines, and presume it is equally as easy to clean an engine by using your oil as it is in using sperm oil.
4. I can see no reason why it is not equal to the best of sperm oil for lubricating machinery.
5. There is in my opinion a very great saving to all parties in using your oil for lubricating machinery.
6. I believe it will stand cold weather better than any sperm oil.

Very respectfully yours,
R. B. MASON, Supt. N.Y. & N.H. Railway.

Steamer Bay State, Oct. 22d, 1849.

Messrs. Robbins, Langdon & Co.,

Gentlemen: In answer to your request for my testimony as to the machinery oil manufactured by you, I will say that I have used it for some time past on the Bay State, and am perfectly satisfied that your statement to me of its good qualities, is correct. As far as its lasting properties go, it wears equally long as sperm oil, runs perfectly free, and has no appearance of thickening. As seeing is better than hearing, I would recommend you to send your friends on board our boat, and they can then, by ocular demonstration, judge for themselves. Yours respectfully, **JOHN GRAY**,
Engineer of Steamer Bay State, Pier 3, N.R.

Steamboat Knickerbocker, Sept. 22, 1849.

Gentlemen: Mr. Hall, Agent of the Norwich and New London Steamboat Co., placed in my hands some of your machinery oil, which he desired me to use on the engine and other machinery, which I have done, and was so much pleased with the working, that I recommended the owner to give you their orders.

I have been using the article since August 19, and with perfect satisfaction, and I am well satisfied that your oil is as good as the best of sperm for lubricating machinery. I am yours very respectfully,

SAMUEL CARTER,

Engineer of Steamboat Knickerbocker, Pier 18, N.R.

To Messrs. Robbins, Langdon & Co.,
Oil Merchants, 133 Water street, New York.

Steamboat Worcester, N. York, Oct. 15, 1849.

Messrs. Robbins, Langdon & Co.,

Gentlemen: I beg to acknowledge the receipt of your letter requesting my opinion as to your oil for machinery, which I had not time to reply to previous to my return to Norwich. I have been using your oil on the engine and machinery of the Worcester with perfect success, and have much pleasure in testifying as to its good qualities. In my opinion, the journals keep cooler with your oil than with sperm, and it wears equally well. Should you at any time wish to refer to me as to your oil, I beg you will do so without hesitation. Yours respectfully, **JAS. CROOKER**,
Engineer Steamboat Worcester, Pier 18, N. R.

New York, August 3d, 1849.

Messrs. Robbins, Langdon & Co.,

Gentlemen: I received your letter in regard to your oil for machinery, which I handed to our engineer, and have much pleasure in sending you an extract from his letter to me on the subject: "I have applied the oil sent me upon our hot journals and cylinders, and find that they keep cooler with it than with sperm oil. I cannot find any fault with the oil, although I have watched it carefully. I have also tried it against an equal quantity of sperm oil, and find it wears quite as well." You are quite at liberty to show this extract to your friends, and shall be happy to give any further certificate you may require. **WM. RIDER**,
Treasurer Union India-rubber Co., 19 Nassau st. N.Y.

New York, March 22d, 1850.

Messrs. Robbins, Langdon & Co.,

Gentlemen: I have been using your machinery oil on the engine and other machinery of the Steamer Southern running from this to Charleston, and find it equal to sperm oil. I shall continue the use of the same, and you are at liberty to refer to me at any time.

Yours respectfully, **DAVID N. MAXON**,

Chief Engineer Steamer Southern.

Steamboat C. Vanderbilt, N. York, Oct. 11, 1849.

Messrs. Robbins, Langdon & Co.,

Gentlemen: In reply to your inquiries respecting the qualities of your machinery oil, I am happy to inform you that I have been using the article sent me for some time past, not only on the engine but on all other machinery connected with it: and from a careful and close examination, I am well satisfied that your oil is as good as the best of sperm oil for lubricating machinery. I have recommended Mr. Lockwood the agent of the company, to give you their orders.

Yours respectfully, **JAMES BAKER**,

Engineer Steamboat C. Vanderbilt, Pier 3, N.R.

Brooklyn, August 29, 1849.

Messrs. Robbins, Langdon & Co.,

Gentlemen: Your letter of the 29th was received, and I am happy to inform you that I have used your machinery oil throughout my establishment, and I am still of the opinion that it is as good as the best of sperm oil for lubricating machinery. I should be pleased at any time to have your friends witness the working, and I am sure, after once doing so, will give you their orders. Please send me another cask by the evening of the 3d, and by so doing you will much oblige.

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ENGINEERS.

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Bancks, C. W.,
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Berrien, John M.,
Michigan Central Railroad, Marshall, Mich.

Buckland, George,
Troy and Greenbush Railroad.

Clement, Wm. H.,
Little Miami Railroad, Cincinnati, Ohio.

Cozzens, W. H.,
Engineer and Surveyor, St. Louis, Mo.

Alfred W. Craven,
Chief Engineer Croton Aqueduct, New York.

Davidson, M. O.,
Eckhart Mines, Alleghany Co., Maryland.

Fisk, Charles B.,
Cumberland and Ohio Canal, Washington, D. C.

Felton, S. M.,
Fitchburgh Railroad, Boston, Mass.

Floyd-Jones, Charles,
South Oyster Bay, L. I.

Gzowski, Mr.,
St. Lawrence & Atlantic Railroad, Montreal, Canada.

Gilbert, Wm. B.,
Rutland and Burlington Railroad, Rutland, Vt.

Grant, James H.,
Nashville and Chattanooga R. R., Nashville, Tenn.

S. W. Hill,
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Lake Superior.

Holcomb, F. P.,
Southwestern Railroad, Macon, Ga.

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New York and Boston Railroad, Middletown Ct.

Latrobe, B. H.,
Baltimore and Ohio Railroad, Baltimore, Md.

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Worcester and Nashua Railroad, Worcester, Mass.

Morris, Elwood,
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Pritchard, M. B.,
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Bellefontaine and Indiana Railroad, Marion, Ohio.

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Ohio and Pennsylvania Railroad, Pittsburgh, Pa.

Sanford, C. O.,
South Side Railroad, Virginia.

Schlatter, Charles L.,
Northern Railroad (Ogdensburg), Malone, N. Y.

Sours, Peter,
Railway, New Jersey.

Stark, George.,
Bost., Con. and Mont. R. R., Meredith Bridge, N. H.

Steele, J. Dutton,
Pottstown, Pa.

Trimble, Isaac R.,
Philad., Wil. & Baltimore Railroad, Wilmington, Del.

Tinkham, A. W.,
United States Fort, Bucksport, Me.

Thomson, J. Edgar.,
Pennsylvania (Central) Railroad, Philadelphia.

Troost, Lewis,
Alabama and Tennessee Railroad, Selma, Ala.

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February 9, 1850. 6m*

United States Railroad Guide and Steamboat Journal.

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5 Liberty Square, Boston, Mass.

Sept. 15, 1849. 3m37

PATENT HAMMERED RAILROAD, SHIP & BOAT SPIKES.—The Albany Iron Works have always on hand, of their own manufacture, a large assortment of Railroad, Ship and Boat Spikes from 2 to 12 inches in length, and of any form of head. From the excellence of the material always used in their manufacture, and their very general use for railroads and other purposes in this country, the manufacturers have no hesitation in warranting them fully equal to the best spikes in market, both as to quality and appearance. All orders addressed to the subscribers at the works will be promptly executed.**JOHN F. WINSLOW, Agent.**Albany Iron and Nail Works, Troy, N. Y.
The above Spikes may be had at factory prices, of
Erastus Corning & Co Albany; Merrill & Co., New York; E. Pratt & Br. Inc. Baltimore Md**LAP—WELDED
WROUGHT IRON TUBES**

FOR

**TUBULAR BOILERS,
FROM ONE AND A QUARTER TO SEVEN
INCHES IN DIAMETER.****THE ONLY Tubes of the same quality and manufacture as those so extensively used in England, Scotland, France and Germany, for Locomotive, Marine and other Steam Engine Boilers.****THOMAS PROSSER & SON, Patentees,**
28 Platt street, New York.**Railroad Iron.****THE UNDERSIGNED ARE PREPARED TO contract for the delivery of English Railroad Iron of favorite brands, during the Spring. They also receive orders for the importation of Pig, Bar, Sheet, etc. Iron.**
THOMAS B. SANDS & CO.,
22 South William street,
New York.

February 3, 1849.

Iron Store.**THE Subscribers, having the selling agency of the following named Rolling Mills, viz: Norristown, Rough and Ready, Kensington, Trindellville, Pottsgrove and Thorndale, can supply Railroad Companies, Merchants and others, at the wholesale mill prices for bars of all sizes, sheets cut to order as large as 58 in. diameter; Railroad iron, domestic and foreign; Locomotive tire welded to given size; Chairs and Spikes; Iron for shafting, locomotive and general machinery purposes; Cast, Shear, Blister and Spring Steel; Boiler rivets; Copper; Pig iron, etc., etc.****MORRIS, JONES & CO.,**
Iron Merchants,
Schuylkill 7th and Market Sts., Philadelphia.

August 16, 1849. 1y33

Railroad Iron.**THE MOUNT SAVAGE IRON WORKS, Alleghany county, Maryland, having recently passed into the hands of new proprietors, are now prepared, with increased facilities, to execute orders for any of the various patterns of Railroad Iron. Communications addressed to either of the subscribers will have prompt attention.**
J. F. WINSLOW, President
Troy, N. Y.**ERASTUS CORNING, Albany
WARREN DELANO, Jr., N. Y.
JOHN M. FORBES, Boston.
ENOCH PRATT, Baltimore, Md.**

November 6, 1849.

Railroad Iron.**THE SUBSCRIBERS ARE PREPARED TO take orders for Railroad Iron to be made at their Phoenix Iron Works, situated on the Schuylkill River, near this city, and at their Safe Harbor Iron Works, situated in Lancaster County, on the Susquehanna river; which two establishments are now turning out upwards of 1800 tons of finished rails per month.**

Companies desirous of contracting will be promptly supplied with rails of any required pattern, and of the very best quality.

REEVES, BUCK & CO.
45 North Water St. Philadelphia.

March 15, 1849.

Monument Foundry.

A. & W. DENMEAD & SON,
Corner of North and Monument Sts.,—Baltimore,

HAVING THEIR

IRON FOUNDRY AND MACHINE SHOP

In complete operation, are prepared to execute faithfully and promptly, orders for Locomotive or Stationary Steam Engines, Woolen, Cotton, Flour, Rice, Sugar Grist, or Saw Mills, Slide, Hand or Chuck Lathes, Machinery for cutting all kinds of Gearing, Hydraulic, Tobacco and other Presses, Car and Locomotive patent Ring Wheels, warranted, Bridge and Mill Castings of every description, Gas and Water Pipes of all sizes, warranted, Railroad Wheels with best fagotted axle, furnished and fitted up for use, complete.

Being provided with Heavy Lathes for Boring and Turning Screws, Cylinders, etc., we can furnish them of any pitch, length or pattern.

Old Machinery Renewed or Repaired—and Estimates for Work in any part of the United States furnished at short notice.

June 8, 1849.

Iron Wire.

REFINED IRON WIRE OF ALL KINDS.
Card, Reed, Cotton-flyer, Annealed, Broom, Buckle, and Spring Wire. Also all kinds of Round, Flat or Oval Wire, best adapted to various machine purposes, annealed and tempered, straightened and cut any length, manufactured and sold by

ICHABOD WASHBURN.

Worcester, Mass., May 25, 1849.

American and Foreign Iron.

FOR SALE,

300 Tons A 1, Iron Dale Foundry Iron.
100 " 1, " " " "
100 " 2, " " " "
100 " " Forge " "
400 " Wilkesbarre " "
100 " "Roaring Run" Foundry Iron.
300 " Fort " "
50 " Catocin " "
250 " Chikiswalongo " "
50 " "Columbia" "chilling" iron, a very superior article for car wheels.
75 " "Columbia" refined boiler blooms.
30 " 1 x 1/2 Slit Iron.
50 " Best Penna. boiler iron.
50 " "Puddled" "
50 " Bagnall & Sons refined bar iron.
50 " Common bar iron.

Locomotive and other boiler iron furnished to order.

GOODHUE & CO.,

New York.

64 South street

American Pig, Bloom and Boiler Iron.

HENRY THOMPSON & SON,
No 57 South Gay St., Baltimore, Md.
Offer for sale Hot Blast Charcoal Pig Iron made at the Catocin (Maryland), and Taylor (Virginia), Furnaces; Cold Blast Charcoal Pig Iron from the Cloverdale and Catauba, Va., Furnaces, suitable for Wheels or Machinery requiring extra strength; also Boiler and Flue Iron from the mills of Edge & Hillies in Delaware, and best quality Boiler Blooms made from Cold Blast Pig Iron at the Shenandoah Works, Va. The productions of the above establishments can always be had at the lowest market prices for approved paper.
American Pig Iron of other brands, and Rolled and Hammered Bar Iron furnished at lowest prices. Agents for Watson's Perth Amboy Fire Bricks, and Rich & Cos. New York Salamander Iron Chests.
Baltimore, June 14, 1849. 6 mos

Wheel, Forge and Foundry Iron.

LOCUST GROVE Wheel Iron of great strength and superior chilling property.
Balt. Charcoal Forge Iron, from Patuxent, Curtis Creek and Gunpowder furnaces.
Elkridge Foundry Iron, of superior strength and softness. Anthracite and Charcoal Iron from Pennsylvania and Virginia. Gas and Water Pipes, Lamp Posts from Elkridge furnace.

LEMMON & GLENN,

6m9

62 Buchanan's Wharf, Baltimore.

Iron.

THE SUBSCRIBERS having resumed the agency of the New-Jersey Iron Company, are prepared to execute orders for the different kinds and sizes of iron usually made at the works of the company, and offer for sale on advantageous terms.—

150 tons No. 1 Boonton Foundry Pig Iron.
100 " No. 2 do. do. do.
300 " Nos. 2 & 3 Forge do. do.
100 " No. 2 Glendon do. do.
140 " Nos. 2 & 3 Lehigh Crane do do.
100 " No. 1 Pompton Charcoal do.
100 " New-Jersey Blooms
50 " New-Jersey Faggoting Iron, for shafts
Best Bars, 1/2 to 4 inch by 1/2 to 1 inch thick.
Do do Rounds and Squares, 1/2 to 3 inch.
Rounds and Squares, 3-16 to 1 inch.
Half Rounds, 1/2 to 1 in. Ovals & Half Ovals 1/2 to 1 1/2 in.
Bands, 1/2 to 4 inch. Hoops, 1/2 to 2 inch.
Trunk Hoops, 1/2 to 1 1/2 in. Horse Shoe & Nut Iron.
Nail Plates. Railroad Spikes.

DUDLEY B. FULLER & Co., 139 Greenwich-st. and 85 Broad-st.

WILLIAM JESSOP & SONS' CELEBRATED CAST-STEEL.

The subscribers have on hand, and are constantly receiving from their manufactory.

PARK WORKS, SHEFFIELD,
Double Refined Cast Steel—square, flat and octagon.
Best warranted Cast Steel—square, flat and octagon.
Best double and single Shear Steel—warranted.
Machinery Steel—round.
Best and 2d gy. Sheet Steel—for saws and other purposes.

German Steel—flat and square, "W. I. & S." "Eagle" and "Goat" stamps.
Genuine "Sykes" L Blister Steel.
Best English Blister Steel, etc., etc., etc.

All of which are offered for sale on the most favorable terms by

WM. JESSOP & SONS,

91 John street, New York.

Also by their Agents—

Curtis & Hand, 47 Commerce street, Philadelphia.
Alex'r Fullerton & Co., 119 Milk street, Boston.
Stickney & Beatty, South Charles street, Baltimore.
May 6, 1848.

JOHNSON, CAMMELL & Co's Celebrated Cast Steel,

AND
ENGINEERING AND MACHINE FILES,
which for quality and adaptation to mechanical uses, have been proved superior to any in the United States. Every description of square, octagon, flat and round cast steel, sheet, shovel and railway spring steel, best double and single shear steel, German steel, flat and square, goat stamps, etc. Saw and file steel, and steel to order for any purposes, manufactured at their Cyclops Steel Works Sheffield.

JOHNSON, CAMMELL & CO.,

100 William St., New York.

November 23 1849.

Railroad Iron.

OF ANY PATTERN AND WEIGHT,
Of a Favorite Brand,
And deliverable in Bond, or Duty paid, at any Port of the U. S., contracted for on favorable terms, by
CHARLES ILLIUS,
20 Beaver St., New York.

Pig and other Iron also contracted for. Sole Agent for "Baxter's Machine and Burning Oil"—particularly adapted for "Railroads" and other Machinery—Preferred to Sperm by the many now using it, and 25 per cent. cheaper.

CUT NAILS OF BEST QUALITY, BAR IRON
(including Flat Rails) manufactured and for sale by
FISHER, MORGAN & CO.,
75 N. Water St., Philadelphia.

Ogden & Martin's ROSENDALE CEMENT.

WE are prepared to enter into arrangements for supplying our Cement for public works or other purposes. We warrant the cement equal in every respect to any manufactured in this country. It attains a great degree of hardness, sets immediately under water, and is a superior article for masonry coming in contact with water, or requiring great strength.

For sale in tight barrels, well papered, at their office by
OGDEN & MARTIN, 104 Wall st.

February 16, 1850. 1y*

The above cement is used in most of the fortifications building by government.

To Steam Engine Builders.

THE Undersigned offer for sale, at less than half its cost, the following new machinery, calculated for an engine of 62 inches cylinder and 10 feet stroke, viz.

- 2 Wrought Iron Cranks, 60 inches from centre to centre.
- 1 Do. do. Connecting Rod Strap.
- 2 Do. do. Crank Pins.
- 1 Eccentric Strap.
- 1 Diagonal Link with Brasses.
- 1 Cast Iron Lever Beam (forked).

The above machinery was made at the West Point Foundry for the U. S. Steamer Missouri, without regard to expense, is all finished complete for putting together, and has never been used. Drawings of the cranks can be seen on application to

HENRY THOMPSON & SON,
No. 57 South Gay St., Baltimore, Md.

Sept. 12, 1849.

8,000 Tons Railroad Iron.

THE OHIO AND PENNSYLVANIA RAILROAD CO. wish to contract for eight thousand tons of Railroad Iron, for the eastern division of their road, extending westward from Pittsburgh. Three thousand tons to be delivered on the Ohio river at Pittsburgh and Beaver, before the close of canal navigation in the present year, 1850; and the remainder in the spring of next year. The rails are to be of the H pattern, in lengths of 20 feet, and are to weigh 60 lbs. per lineal yard. They are to be subject to the inspection of Solomon W. Roberts, Chief Engineer.—For further particulars address the President of the Company at Pittsburgh.

By order of the Board of Directors.

WM. ROBINSON, Jr., President.

S. S. Keyser & Co., IRON WAREHOUSE,

Corner of South and Pratt Streets,
BALTIMORE, MD.

Selling Agents for the Rough and Ready Bar Iron and Elk Boiler and Flue Iron Rolling Mills, Sarah and Taylor Furnaces, and Wrightsville Hollow Ware Foundry, and Dealers in Bar and Sheet Iron, and Cast, Sheer, German, Blister, Spring and Electrodes Steel, etc., etc.

Smith & Tyson,

GENERAL COMMISSION MERCHANTS,
No. 25 South Charles St., Baltimore, Md.

AGENTS for the Celebrated Columbia Pig Iron, suitable for Car Wheels and Chilled Rolls.
Columbia refined Charcoal Blooms; Refined Charcoal Juniata Billet Iron for Wire; Refined Iron for Bridging, of great strength; Cut Nails, Spikes, and Brads; Railroad Spikes and Wrought Chairs. 22tf

To Railroad Companies and Contractors.

FOR SALE.—Two Locomotive Engines and Tenders, at present in use on the Beaver Meadow Railroad, being too light for their coal trains, but well calculated for either gravel or light passenger trains.

They weigh, in running order, about 8 tons each—having one pair of driving wheels 4 feet diameter, 4 truck wheels 30 inches diameter, with cylinders 10 in. diameter, and 18 inches stroke of piston. Tenders on 4 wheels. Address **JAMES ROWLAND,**

Pres't. Beaver Meadow Railroad & Coal Co.,
Philadelphia.

or, **L. CHAMBERLAIN, Sec'y,**
at Beaver Meadow, Pa.

May 19, 1849. 20tf

Railroad Instruments.

THEODOLITES, TRANSIT COMPASSES, and Levels, with Fraunhoffer's Munich Glasses, Surveyor's Compasses, Chains, Drawing Instruments, Barometers, etc., all of the best quality and workmanship, for sale at unusually low prices, by
E. & G. W. BLUNT,

No. 179 Water St., cor. Burling Slip.
New York, May 19, 1849.

Rosendale Cement.

THE NEWARK AND ROSENDALE LIME AND CEMENT CO. are now manufacturing at their works in NEWARK, N. J., and Ulster county, N. Y., a very superior article of *Hydraulic Cement*—also Lime Calcine Plaster, etc. Contractors and dealers will find it to their advantage to call or make application before purchasing elsewhere. All communications addressed to the subscriber, at Newark, N. J., will be punctually attended to.

1y*15

HENRY WILDE, Secretary.

Patent India Rubber Steam Packing.

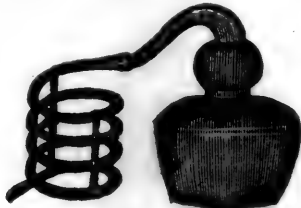
THIS article, made by the subscriber, who alone is authorised to make it, is warranted to stand as high a degree of heat as any that has been or can be made by any person—and is the article which has made the reputation of India Rubber Steam Packing and the demand therefor. A large assortment of all thick nesses requisite for any description of engines, steam pipes, valves, etc., constantly on hand and for sale by the manufacturer and patentee, who will give every information regarding its properties, mode of use, etc. at the warehouse. JOHN GREACHEN, JR., 98 Broadway, opposite Trinity Church. New York, October, 1849.

Passenger Car Linings.

THE Advertiser continues to make to order the Enamelled Car Linings which have been so highly approved the last three years, and are now exclusively used by all the Northern Railroads. No pains are spared to get out new styles, and adapt them to the tastes of every consumer. Orders addressed to CHARLES STODDER, No. 75 Kilby street, Boston, will have prompt attention. March 23, 1850. 2m

CAUTION.

RAILROAD COMPANIES and others are hereby cautioned against using or vending our improvement for easing the lateral motion as applied on Railroad Cars. Letters Patent having been granted to us in 1841, any party or parties so making or using said improvement without license from us will be proceeded against according to law. DAVENPORT & BRIDGES.



P. H. Griffin,

Corner of Steuben and James Sts. Albany, N.Y. CONTINUES to manufacture copper flues for locomotive boilers, brewers' coppers, stills, tanner heaters, etc. Copper work in general, at the shortest notice. He has constantly on hand brass cocks, brass valves, copper pumps of every variety. Orders promptly attended to. 1y14

FOWLER M. RAY'S Patent India-rubber Railroad CAR SPRING.

New York and Erie Railroad Shops. Piermont, March 26, 1850.

This will certify that from practical experience in the use of Fowler M. Ray's India rubber Car Springs, I believe them to be far superior to any others now in use.

I have never known them to be affected by any change of temperature, as other Rubber Springs have been affected on this road.

I am at the present time repairing a Passenger Car that Mr. Ray and myself mounted with his springs about two years and eight months since.

The springs are at the present time as perfect, to all appearances, as when first applied to the car.

Respectfully yours,

HORACE B. GARDNER,
Foreman of the Car Shops.

Supt. Office N.Y. & H. R.R.,
New York, March 8, 1850.

This is to certify that we have used the Rubber Springs manufactured by Mr. F. M. Ray for the past twenty months, "both for Passenger and Freight Car Springs and Bumpers, and of different sizes," and have in every case given entire satisfaction, and I consider them the best spring now in use.

M. SLOAT, Supt.

Harlem R.R. Depot,
New York, March 7, 1850.

This is to certify that we have used Mr. F. M. Ray's India-rubber Springs for over eighteen months, and find them to be easy and durable, and recommend them to railroad companies, as being superior to anything we have tried.

J. M. SMART,
Foreman at 42d St. Depot.

Office New Jersey Railroad Co.,
Jersey City, March 8, 1850.

FOWLER M. RAY, Esq.,

Dear Sir: In answer to your enquiries respecting the operation of the Vulcanised Rubber Springs, purchased by our company from you some two years since, I reply that they are superior to any spring in use, (that I have either seen or heard of).

The improved form of your spring, consisting of a solid piece of vulcanised rubber with bands on the outside, is far superior to your first form, consisting of disks of rubber with metallic plates interposed.

The last named form was tried, if you recollect, at a much earlier period; and then was replaced by your last form.

I have no hesitation in saying that your springs have given entire satisfaction, and most cheerfully recommend them to railroad companies throughout the country for the following reasons:

- 1st. The cost is 30 per cent. less.
- 2d. Saving of weight on each car of 8 wheels from 700 to 800 lbs.
- 3d. Less care and attention is required, as they are not liable to get out of repair.
- 4th. A great saving is secured in the wear and tear of the cars and rails from their great elasticity.
- 5th. The freedom from noise.
- 6th. There is greater safety in case of accident, as they cannot be broken.
- 7th. The comfort of passengers is enhanced sufficiently to pay the expense, waiving all the other reasons that I have given.

Should this fail to satisfy any person enquiring, you are at liberty to refer to me, No. 150 Washington St., Jersey City. Yours respectfully,

T. L. SMITH, Supt.

New York, March 11, 1850.

I have used the Patent India-rubber Spring purchased of Mr. Ray, upon the cars of the New York and New Haven Railroad, and have found them efficient and economical; and when applied to the axles and draw springs, believe them to be quite equal to any in use. I have found a combination of these springs with a steel spring under the transom beam a very satisfactory arrangement, and am now using this plan in all new cars.

Yours respectfully,
ROBERT SCHUYLER.

February 25, 1850.

From practical observation of the use of the India-rubber Car Springs, manufactured and sold by your company, we are entirely satisfied in their application, and do not hesitate to recommend them as elastic, durable, requiring no repairs for years, and retaining their consistency during all extremes of weather. We have applied them for the past two years, and consider them superior for all railroad purposes.

Yours truly,
OSGOOD BRADLEY, Car Builder, Worcester.
T. & C. WASON, do. Springfield.
DEAN, PACKARD & MILLS, do. do.
DAVENPORT & BRIDGES, do. Cambridgeport.

Office of the New Jersey Railroad Co.,
Jersey City, March 7, 1850.

This is to certify that we have had Mr. F. M. Ray's India-rubber Springs in constant use under our cars, and as Bumper Springs for upwards of two years, and they have in every way given perfect satisfaction.

The present form of spring we deem far superior to the form of Disk, having used both forms, although we have none of those made in Disks at present in use.

We take pleasure in recommending these springs to all railroad companies.

J. P. JACKSON, Vice Prest.
New Jersey Railroad and Trans. Co.

Roxbury, February 28, 1850.

In compliance with your request, I take great pleasure in stating the result of my experience in the use of "Ray's Patented Vulcanised India-rubber Car and Engine Springs." We have used them nearly two years, and never had one fail in any way. The cold weather does not affect them, as it has other rubber springs we have used.

With sixteen years' experience as superintendent of machinery on the Boston and Providence railroad, I take pleasure in saying that your springs are the best we ever used, or I ever saw used elsewhere. We have 20 cars rigged with them, of which I can say that the springs are as good now as when first applied. I put 24 lbs. of the rubber under the fore and end of one of our heaviest engines, taking off 250 lbs. of steel springs—it has been in use 18 months, and is in as good condition now as when first put under the engine.

Very respectfully yours,

GEO. S. GRIGGS,
Supt. of Machinery, Boston and Prov. R.R.

Fall River, February 2, 1850.

In answer to yours of the 20th ult. I would say that this company has for some 10 or 12 months past been using "Ray's India-rubber Springs." We have applied them to both passenger and freight cars with uniform success. They have invariably preserved their elasticity and consistency through all the extremes of weather; and we are now applying them whenever the steel spring fails. I am well satisfied that they are particularly adapted for railroad purposes.

Very respectfully yours,

GEO. HAVEN,
Supt. Fall River Railroad.

Jersey City, March 9, 1850.

This is to certify that the present form of Mr. F. M. Ray's India-rubber Car Spring I consider far superior to the form of Disk, having used both forms.

I take pleasure in recommending these springs to all railroad companies. DAVID H. BAKER,
Foreman of Car Shop of N.J. R.R. & Trans. Co.

Boston, March 5, 1850.

In answer to your enquiry about India-rubber Springs, I have to say that we have used them to a considerable extent on both freight and passenger cars, and also on several of our tenders; and I am very well satisfied that they answer all the purposes for which they are intended. I believe the India-rubber will soon supersede all other springs for cars and tenders.

Yours truly,
S. M. FELTON,
Supt. Fitchburg Railroad.

Old Colony Railroad Office,
Boston, March 6, 1850.

EDWARD CRANE, Esq.,

President New England Car Co.,

Dear Sir: In compliance with your request I would state that the Old Colony Railroad Company have had in use upon their road, India-rubber Springs furnished by your company, for more than eighteen months past, during which time they have been extensively used under Passenger and Freight Cars, Locomotive Tenders, and for Drawer and Buffing Springs, with the most perfect success. The elasticity and consistency of the Rubber has never been unfavorably affected by either extremes of heat or cold—and from the experience which we have had in the use of Rubber Springs, I think them well adapted for railroad purposes—and therefore we have for some months past used Rubber almost exclusively, in all places where springs are required.

Respectfully yours, etc.,

JAS. H. MOORE,
Supt. O. C. Road.

Troy, February 27, 1850.

We have been using your India-rubber Car Springs for nearly two years—and we take pleasure in saying that in our opinion the rubber has to a certain extent already, and may eventually entirely supersede all other Springs for Railroad Car purposes. We now use it entirely for Draw Springs and Bumpers, considering it better and lighter than steel.

During our two years' experience in the use of it, we have not known any to lose their elasticity, or fail in any way; and we cheerfully recommend the rubber for railroad car springs. Very respectfully,
EATON, GILBERT & CO.

To Practical Machinists.

AN excellent opportunity now occurs to a practical Machinist, of WELL ESTABLISHED REPUTATION, and some capital, to engage extensively in the STEAM ENGINE, BOILER and FOUNDRY BUSINESS.

An establishment is now ready for business, ample in all its details, including extensive wharf room, for any sized steamboats, and from its position, if properly conducted, will doubtless command a large share of business.

A practical Machinist, as a partner is required, to conduct the whole establishment: and only those FULLY COMPETENT need apply. Address (post paid) "MACHINE CO.," Box No. 741, Philadelphia, Pa. 1ml4

Etna Safety Fuse.

THIS superior article for igniting the charge in wet or dry blasting, made with DUPONT'S best powder, is kept for sale at the office and depot of

REYNOLDS & BROTHER,

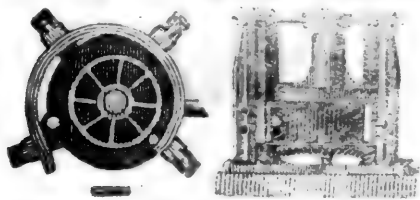
Sole Manufacturers,
No. 85 Liberty St.
NEW YORK.

And in the principal cities and towns in the U. States.

The Premium of the AMERICAN INSTITUTE was awarded to the Etna Safety Fuse at the late Fair held in this city.

November 3, 1849.

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MACHINERY.**Henry Burden's Patent Revolving Shingling Machine.**

THE Subscriber having recently purchased the right of this machine for the United States, now offers to make transfers of the right to run said machine, or sell to those who may be desirous to purchase the right for one or more of the States.

This machine is now in successful operation in ten or twelve iron works in and about the vicinity of Pittsburgh, also at Phoenixville and Reading, Pa., Covington Iron Works, Md., Troy Rolling Mills, and Troy Iron and Nail Factory, Troy, N. Y., where it has given universal satisfaction.

Its advantages over the ordinary Forge Hammer are numerous: considerable saving in first cost; saving in power; the entire saving of shingler's, or hammerman's wages, as no attendance whatever is necessary, it being entirely self-acting; saving in time from the quantity of work done, as one machine is capable of working the iron from sixty puddling furnaces; saving of waste, as nothing but the scoria is thrown off, and that most effectually; saving of staffs, as none are used or required. The time required to furnish a bloom being only about six seconds, the scoria has no time to set, consequently is got rid of much easier than when allowed to congeal as under the hammer. The iron being discharged from the machine so hot, rolls better and is much easier on the rollers and machinery. The bars roll sounder, and are much better finished. The subscriber feels confident that persons who will examine for themselves the machinery in operation, will find it possesses more advantages than have been enumerated. For further particulars address the subscriber at Troy, N. Y.

P. A. BURDEN.

Railroad Spikes and Wrought Iron Fastenings.

THE TROY IRON AND NAIL FACTORY, exclusive owner of all Henry Burden's Patented Machinery for making Spikes, have facilities for manufacturing large quantities upon short notice, and of a quality unsurpassed.

Wrought Iron Chairs, Clamps, Keys and Bolts for Railroad fastenings, also made to order. A full assortment of Ship and Boat Spikes always on hand.

All orders addressed to the Agent at the Factory will receive immediate attention.

P. A. BURDEN, Agent,
Troy Iron and Nail Factory, Troy, N. Y.

RAILROAD WHEELS.

CHILLED RAILROAD WHEELS.—THE UNDERSIGNED are now prepared to manufacture their Improved Corrugated Car Wheels, or Wheels with any form of spokes or discs, by a new process which prevents all strain on the metal, such as is produced in all other chilled wheels, by the manner of casting and cooling. By this new method of manufacture, the hubs of all kinds of wheels may be made whole—that is, without dividing them into sections—thus rendering the expense of banding unnecessary; and the wheels subjected to this process will be much stronger than those of the same size and weight, when made in the ordinary way.

A. WHITNEY & SON,
Willow St., below 13th,
Philadelphia, Pa.

CHILLED RAILROAD WHEELS.—THE UNDERSIGNED, the Original Inventor of the Plate Wheel with solid hub, is prepared to execute all orders for the same, promptly and faithfully, and solicits a share of the patronage for those kind of wheels which are now so much preferred, and which he originally produced after a large expenditure of time and money.

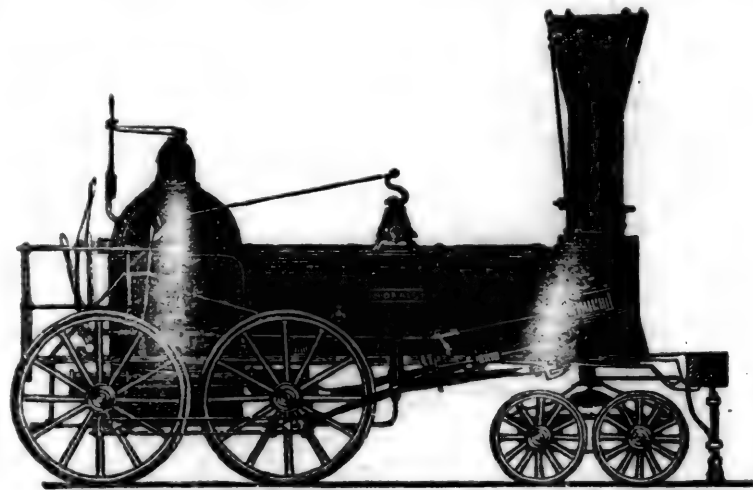
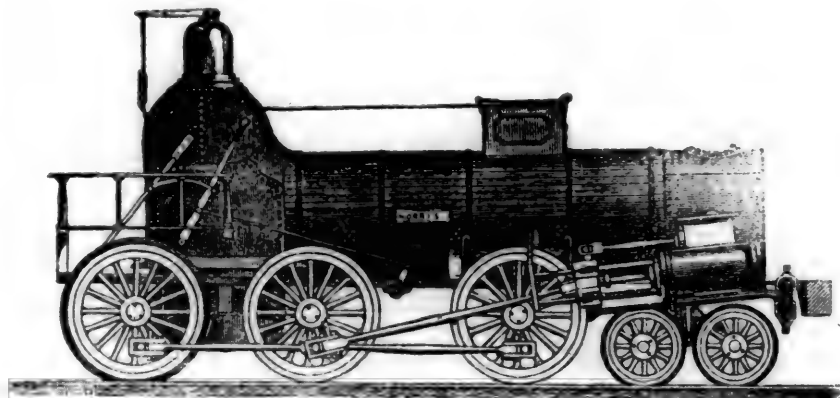
A. TIERS,
Point Pleasant Foundry.

He also offers to furnish Rolling Mill Castings, and other Mill Gearing, with promptness, having, he believes, the largest stock of such patterns to be found in the country.

Kensington, Philadelphia Co.,
March 12, 1848.

NORRIS' LOCOMOTIVE WORKS.

BUSHHILL, SCHUYLKILL SIXTH-ST., PHILADELPHIA,



THE UNDERSIGNED Manufacture to order Locomotive Steam Engines of any plan or size. Their shops being enlarged, and their arrangements considerably extended to facilitate the speedy execution of work in this branch, they can offer to Railway Companies unusual advantages for prompt delivery of Machinery of superior workmanship and finish.

Connected with the Locomotive business, they are also prepared to furnish, at short notice, Chilled Wheels for Cars of superior quality.

Wrought Iron Tyres made of any required size—the exact diameter of the Wheel Centre, being given, the Tyres are made to fit on same without the necessity of turning out inside.

Iron and Brass castings, Axles, etc., fitted up complete with Trucks or otherwise.

NORRIS, BROTHERS

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AMERICAN RAILROAD JOURNAL.

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HENRY V. POOR, Editor.

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American Railroad Journal.

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Saturday, June 8, 1850.

An Essay on Pen and Pocket Cutlery,

Embracing a Detailed Description of the Mechanical, Chemical, and Manual Operations Performed on Certain Raw Materials, to Convert them into the Means, Implements, and Materials, for Manufacturing Pen and Pocket Knives.

BY A. L. HOLLEY.

Continued from page 338.

CHAPTER III.—BLADES DESCRIBED AND CLASSIFIED. FORGER'S IMPLEMENTS AND APPARATUS. COKE, ITS NATURE AND MANUFACTURE. MARKING, HARDENING AND TEMPERING—DIFFERENT METHODS. TABLES OF COLORS, BATHS, TEMPERATURES, ETC. IMPROVEMENTS. FUEL. BITUMINOUS COAL. CHARCOAL.

The different parts of a knife blade are called the faces, back, edge, point, neck, swages, tang and nailmark. The *swages* form a blunt edge, upon the blade's back, the corners having been removed.—They are of two kinds, the "common swage" com-

mencing at or near the neck, increasing in width toward the centre, and ending at the point of the blade. They are comparatively easily formed, therefore confined wholly to the coarser varieties of knives. The "knicked" or "cut-in" swage commences with a shoulder, usually near the point, and tapering, ends at the point. This is usually considered more neat and handsome than the other, and the forger receives a greater price for making it. The *tang* is the part of the blade which reaches from the cutting part to the end opposite the point, on which is the manufactory stamp, and the joint. The "shoulder" of the tang on its back, by striking the spring end, keeps the blade open, and at any desired angle with the handle. The "kick" is the part of the tang on which the blade rests when shut, thus keeping it from striking the edge on the back of the knife.

Blades are divided into three great classes, viz: job, pen and pocket blades. The first class is indescribable, comprising all odd and uncommon blades, each of which is adapted to some particular work. The next class is subdivided into spear, square, forward and blunder joints, and nail blades. On spears the joint is in the centre of the face, the edge and back terminating there convexly. The edge of square points should never be convex, and the point is the diagonal of a parallelogram. The edge of forward points is either hooking, straight, or regularly concave, the back being convex near the point. Blunder points are always concave on the edge, till within one-eighth or one-half an inch of the point, (which is like the spear) and there very convex. These blades are usually considered "homely," except by cutters, but are fashionable, and well adapted to cutting. Nail blades usually terminate with a blunder point, the face being files. These are especially adapted to cutting and trimming the nails, though convenient for other purposes. Pocket blades are divided into six classes, viz: forward and spear points, corboe, cemetar, razor and dirk blades. The two first are like the same varieties of pen blades, only shorter in proportion to their width. Corboe blades are similar to forward points, except shorter in proportion to their thickness and length, and the convexity of the back commences nearer the tang. The name implies the shape of the razor, dirk and cemetar blades. The nailmark is of two kinds, the "common," or crescent shaped, and the "French," which is a long straight impression very near the

back, commencing at the knicked swage, (for they usually go together) and extending to the tang and over from one-half to three-fourths of the face of the blade. This is considered more neat and handsome than the common mark. The nailmark is always on the "mark side" of the blade, though the mark side, as it is termed, of the knife, is the one on which is the nail nick of largest pocket blade.

We will first describe the old English manner and means of forging blades, though at present those of making all pen and most pocket blades. The forgers occupy a room by themselves, furnished individually with a forge somewhat smaller than a blacksmith's, and a trough and bellows in proportion. The chimney is very large, in order to give free passage to the gas and smoke in coking. The anvil, which runs at right angles with the outside of the forge that the operator may turn but one-quarter round to strike, is about 15 inches in length 5½ wide and 12 deep, sunk about six inches, and wedged into a large post, which is set firmly into the earth. In front of this is a stationary table, called the bench, from three to four feet long, and from 12 to 18 inches wide, with sides two inches high, and all covered with sheet iron, and a little lower than the top of the anvil, extending to the forge on the left, (for the operator always turns to the right from the fire to the anvil,) and some 12 inches on the right. Before this table is the wall, and a window. The surface of the anvil is smooth for some three inches on the right, with a shoulder in front, and convex toward the table, then filled with mortices, into which the bosses, chisels and gauges are wedged. The bosses for forging are blocks of steel, from one-half to two inches broad, and from three-fourths to two inches long, with square shoulders in front, convex outer edges, and surfaces level lengthwise, and convex the other way. The "bits" of the tongs, which are of different sizes, are on one side of the "shanks," that the bar of steel may project beyond the rivet. The hammers are iron, faced with steel, weighing from 2½ to 5½ pounds, into which the handles are fastened near the top. A small but hot fire is made of Liverpool coke, which is bituminous coal freed from all hydrogen gas, water and tar, and a large portion of its sulphur, by fire. It is either of a dull jet black appearance, or when made in a blade forger's fire, it exhibits a vitreous or metallic lustre, with a porous texture, and is not as heavy as raw

coal—for 20 pounds of the latter will produce but from 14 to 16 pounds of coke. It is valuable in proportion to the amount of carbonaceous substance it contains, and that coal is preferable which exhibits a soft, dull appearance of carbonized vegetable matter. Small pieces of coke may be occasionally selected from large quantities, that can hardly be distinguished from charcoal. For blast furnaces it is but a substitute for charcoal, and is manufactured in hearths in great quantities. In a dark night, the appearance of these long hearths is exceedingly grand and beautiful. In front the dark figures of the operatives, and the lurid fires blazing like a burning crater, and emitting dense columns of black smoke which rise to the clouds in the rear, may well remind one of Vulcan's Etnean forges, and the fires of the Cyclops and the Broutes.

For some purposes, coke is made in ovens from six to eight feet broad, eight feet high, and eighteen inches diameter at the top. In this country, blade forgers make coke daily, and enough at once for a day, by placing on the fire about three shovels full of coal, which is no sooner subjected to a blast from the twyes, than it begins to emit a very light brown thick smoke, which in the evening, as it slowly and heavily curls up, is very beautiful and well worth seeing. This smoke, which is exceedingly dense, is hydrogen gas and tar, with some sulphur, which is highly inflammable, and as soon as the least blaze from the fire below comes in contact with it, it instantly vanishes and leaves the dark mass of coal sending forth streams of fire from every point. As the heat increases, by constant stirring and a strong blast of wind the coal gradually expands, and becomes coke as above described, when it is sprinkled with water to quench the fire, and is then ready for use. The bars of steel, which usually measure from 3-8 x 3-32 to 1 x 1-4 inches, are cut into convenient lengths, and two at once placed in the fire. The first process is called "mooding," and consists of partially shaping the blade and cutting it from the bar. In this operation only one side of the blade is made, and the other left level with the bar. The next process termed "tanging," is forging the tang with a second heat, which in pen blades requires from 20 to 24 light blows from a good workman's hammer.—At the next heat the blade is "smithed." By this operation, the other face and shoulder of the blade are forged, the nail mark cut on a curved stationary chisel, and the swages struck. The blade is also trimmed, straightened, and brought to an edge, and its shape and proportions perfected, which require but a few strokes of the hammer. The steel must not be heated to too high a temperature, as before mentioned, and the tang in particular should not be hammered when cool, for in that case it is liable to draw forth sundry unpleasant screams, etc., from the drill which bores it, and sarcastic observations from the cutler who files it. The blade is then "choiled" by another hand; which consists of simply running a three square file once or twice through the neck or that which joins the cutting part to the tang, to give shape to the blade, and to remove the "fash" or superfluous particles which the forger leaves, and which cannot be removed by the grinder. They are then passed through a process termed "laying on," which is levelling the mark side of the tang and other parts which are to receive the manufactory stamp, on grindstones, in order that the latter may not be eraced when again ground and polished. The forger then receives the blades again, and places them in a long row on a steel plate over a slow fire, and as fast as

they turn blue at the temperature of about 590° F. the words and characters are impressed with a stamp of steel types. The best of these stamps or marks are made in Sheffield, England, probably with very small chisels, though there the art of cutting them is a secret. The object of bluing the blades is to slightly soften them, and particularly to color the letters which are sunk below the level of the tang, and if bright might be illegible.

Hardening is the next operation, which shows one of the remarkable and invaluable qualities which steel alone is known to possess, though from recent experiments on swords and coins by Drs. Pearson and Dize, it is supposed that the ancient Greeks and Romans were unacquainted with a method of hardening either copper or an alloy of some eight or nine parts copper and one of tin. If steel at a great heat is suddenly plunged into cold water, it becomes extremely hard and brittle, though the lower the heat sufficient to produce this effect the better the quality of the metal, and the greater its compactness the less the heat required. It is necessary also, in order to ensure an equal degree of hardness in all parts of the instrument, to thoroughly cleanse the surface previous to heating, as any oxide of iron will produce a contrary effect.—Saline solutions have been tried for hardening, also a current of cold air and mercury, but nothing has proved so effectual as water, provided the steel is heated to a low temperature. Oil is often tried, particularly for large blades, being less liable to crack them than water.

To be continued.

From the Baltimore American. Baltimore and the West.

A number of the merchants of Baltimore were addressed on Thursday night by Mr. L. C. Haynes of Tennessee, at Union Hall, in respect to the advantages likely to result to the city of Baltimore from the completion of certain Tennessee improvements.

He stated the fact, and displayed the evidences on which it rested, that the commercial prosperity of the Atlantic cities depends on their commercial connection with the Mississippi valley.

Mr. H. said that a striking proof of this truth could be found in the examination and comparison of the commerce of Virginia and New York.—They are both Atlantic States—both started together in the race of independence, wealth, population and commerce—both possess harbors among the finest in the Union. Virginia had the advantage in the beginning. Her imports amounted in 1769, to \$4,255,800; the imports of New York to \$945,000. Thus they started together.

But New York, perceiving that her commercial prosperity depended upon her connection with the West, from which she might draw the materials for subsistence, manufactures and commerce, made haste to form that connection through her railways and canal. Virginia, self-satisfied with her natural advantages, did nothing to bring herself into commercial communication with the Mississippi valley. She slept at her post until a very recent date.

What, Mr. H. asked, had been the result? In 1832 the imports of Virginia had gone down from \$4,255,800 to \$1,213,000, while the imports of New York in the same period had gone up from \$945,000 to \$57,000,000. Why? Because New York was connected and Virginia unconnected with the rich, the fertile, the great and the growing West.

The tonnage of Virginia in 1791 was 33,330 tons, in 1838 it had gone down to 7,405 tons; while the

tonnage of the city of New York alone had gone up in 1838 to 400,971 tons.

Mr. H. said he repeated that it had become a primary truth, almost self-evident, which irresistibly commands the assent of all enlightened minds, that the commercial prosperity of the Atlantic cities depends on their commercial connection with the great valley of the Mississippi; and that Baltimore perceives and appreciates this truth, is made manifest through her noble and unceasing exertions to tap by the Baltimore and Ohio railroad the valley of the Ohio. And if Baltimore had come to the conclusion that one connection with the West would be good for her, it follows by irresistible deduction that two would be better.

It was under these impressions, Mr. H. said, he desired to direct the attention of the merchants of Baltimore to the advantages likely to result from contemplated lines of public works in Tennessee, by which this city is to have another connection by steam with the Mississippi valley.

Through a mixed route of railroads, river and canal, there is already an easy transit to Lynchburg. From Lynchburg to the Tennessee line, the Tennessee and Virginia railroad is in rapid and vigorous course of completion. At farthest, it will be finished in four years, the State of Virginia having taken three-fifths of the stock. If you start at Memphis East, you will find a company organized by the style of the Memphis and Charleston railroad company, with Gov. Jones at its head, and a subscription of stock to the amount of \$1,300,000. Running from Memphis, it will intersect the Nashville and Chattanooga railroad near the latter place. The Nashville and Chattanooga railroad was all, he believed, under contract. The actual subscription of stock to that work, together with the bonds to be guaranteed by the State of Tennessee, was \$2,588,450. It will be completed to Chattanooga by 1851.

The East Tennessee and Georgia railroad completes the line to the city of Knoxville. Funds have been subscribed by individuals and appropriated by the State, very nearly sufficient to complete this work in two years. Eighty miles are graded, on forty miles of which the timbers are down ready for the iron. An agent has been appointed by the Governor, under act of Assembly, to go to Europe to purchase iron for this work. The completion, then, in four years, of the entire line of works from Memphis on the one hand to the city of Knoxville, and from Lynchburg on the other to the Tennessee line, is as certain as any event depending on human agency.

From Knoxville to the Virginia line, a distance of 120 miles, it will be perceived, said Mr. H., is not as yet sufficiently provided for. It is true a company has been incorporated, engineers are in the field surveying the routes with a view to the location of the road, and a subscription made to the work of \$650,000. Shall this great line of public works about to stretch from the city of Memphis to the city of Baltimore be kept asunder by a failure to complete this central link from Knoxville to the Virginia line, but 120 miles in length? This is a question he came to put to the merchants of Baltimore interested in the trade of the West.

If you think this central link in this great chain from the father of waters to your beautiful city, would yield a fair dividend on the capital stock—if you think its completion would greatly enhance the trade of Baltimore with the Western merchants, we should be glad if you would aid its speedy construction by the subscription to its capital stock.

He said that the capacity of the merchants of Baltimore to trade with the merchants of the West is limited by their capacity to purchase of you.— Their ability to purchase of you is limited by the capacity of the people to purchase of them. The capacity of the people to purchase of them is limited, by the want of all adequate means of commercial intercourse, by which their surplus products can be carried to those points of demand where consumers lie under the necessity of purchasing them. If it should be your pleasure to give your aid to the construction of this line, you will greatly increase the capacity and ability of the people to purchase of the Western merchants, and them of you. Thus you might contribute powerfully to increase the trade of Baltimore with the merchants and people of the west.

Mr. H. said that a statistical view of the productions of Tennessee, unwooded by markets, and unstimulated by adequate prices, would indicate what would be the advantages of her trade were she and this city brought into cheaper and more rapid communication, by means of steam.

Mr. H. said Tennessee produces 13,000,000 of bushels of wheat. Deducting one half for consumption would leave 6,500,000 bushels for export. The highest average price in Tennessee, he said, was fifty cents. The total value of the sum which might be exported would be \$3,250,000. It brought to the Atlantic slope, it would pay railroad charges and yield 80 cents per bushel; or an aggregate sum of \$5,900,000, instead of \$2,250,000; and an increased profit to the wheat growers of Tennessee of \$1,950,000.

She produces, he said, 74,000,000 of bushels of Indian corn. Of this sum between two and three millions of bushels are exported, principally to N. Orleans, over a river transit of 1200 or 1500 miles. After deducting freight, insurance, commission and damage, it yields a very poor profit to the producer. To deduct one half for consumption would leave for export 32,000,000 of bushels. It is worth in Tennessee from 10, 15, to 20 cents per bushel. It would bear the cost of freight to the Atlantic cities and yield 35 cents. Here would be a gain to the corn growers in Tennessee over the highest market price at home of \$4,800,000.

The cotton crop of North Alabama, Middle Tennessee and North Mississippi, is about 400,000 bales. From Memphis, as the starting point, the cost of transporting a bale of cotton to the Eastern cities (compounded of freight, insurance, factorage, storage at New Orleans, re-shipment, with a new set of charges for freight and insurance coastwise, and the interest for thirty days incident to its transit to the Eastern cities) is about \$5.

It cannot be doubted that a large portion of this cotton would come to the Eastern cities over this line of Tennessee and Virginia works:

1. Because the freight would be as cheap.
2. Because over this line it would reach Liverpool some twenty days sooner than by N. Orleans.
3. Because it would, by this route, be 2500 miles nearer the foreign market.

The tobacco of Tennessee would come over this line; because, in the hot and damp climate of N. Orleans and the Gulf, it loses its flavor and incurs an estimated damage of ten per cent.

Flour and corn would also find their way to the Eastern cities by this route; because, in the climate of New Orleans, flour suffers a damage of 75 cents per barrel; and corn will average 25 per cent. less return than that shipped to foreign markets from the Eastern cities.

Bacon, pork, beef, butter and lard would also come upon this line from Tennessee, intended for foreign markets; because they suffer damage from 15 to 20 per cent. by way of New Orleans. Thus it may be seen that the damage on the articles named would very nearly cover the cost of freight from Tennessee to Baltimore.

This line, too, would be open for transportation from January to January; while it is only about three months in the year that the shipment of many of the articles specified would not be a total loss by way of New Orleans. It would also have advantage over the Northern routes by rivers and canals, because they are frozen up for several months in the year. These facts would certainly compel the larger portion of those articles specified, intended for distant markets, over this route.

Steam Explosions.

Within the last twenty years the use of steam has increased with almost incredible rapidity. By reducing the expense and saving time it has increased the amount of travelling a hundred fold, and for the transportation of merchandise, and for manufacturing and other mechanical purposes, it is rapidly taking the place of all other sources of power. Thus, either by travelling on steamboats and railroads, or in the industrial pursuits almost every person in the country exposes himself more or less to whatever of danger there is in the use of steam as a stationary or locomotive agent.

The proper management of this agent therefore becomes one of the most important questions which relate to the physical welfare of a people, and yet it has not hitherto been so managed as to prevent the recurrence of accidents of the most fatal character. The late Hague street explosion will long be remembered as one of the most terrible on record. There have been more recently on the Western lakes and rivers similar occurrences not much less disastrous. The explosion of the boiler of the steamer Wayne, on Lake Erie, is perhaps the most recent of the warnings of this kind. But they are frequent enough in all directions to call for the interference of the government by penal enactments, and especially by most thorough investigation of the causes of these accidents, and by ample inducements to the discovery of practical remedies.

There is no assignable limit to the power of steam, and yet it is always controllable. We do not doubt but that explosions sometimes occur as a result of gradually increased tension of steam. In such cases the common safety valve, if left free to act, is a perfect security. But with present knowledge and facilities, boilers are now generally so constructed that the danger from this cause is not great. The danger is of a different kind. It results from the recklessness, carelessness or ignorance of the engineer. If he is ignorant of the construction of the machinery, there may be a deficiency in the supply of water which he may not know how to remedy, or he may be inattentive and allow the water to get low, or for the purpose of temporarily generating steam more rapidly than would otherwise be possible, he may intentionally keep the water low. But whatever may be the cause of it, the fact is beyond doubt that, in the great majority of steam explosions, the water has been so reduced that a portion of the boiler, and often a large surface, becomes highly heated, in many cases to redness. It is probable that the explosion results from a slight relief of pressure for a moment within the boiler, so that the remaining water is by violent ebullition thrown upon the highly heated iron, and instantly converted into steam of such tension that no boiler could resist it. Whether this is the correct explanation or not, the facts remain, that the water is low in the boiler, and that the iron is highly heated immediately before an explosion in almost all cases, and these are therefore the circumstances to which attention should be directed. There should be some means of pointing out this condition of things, something which should act independently of the engineer, and in such a way that he cannot control it. If it requires any care on his part, then it furnishes no security against his inattention or incapacity. If

he can control it, then it furnishes no security against his recklessness, the uncontrollable impulse of rivalry, or the intimidations of steamboat captains.

It has been suggested that these conditions would be fulfilled by making an orifice in the iron plate directly above the fire arch, and filling it with some such metal as lead, which would not melt while covered with water, and would not therefore interfere with the progress of the boat, or with the propelling of the machinery, so long as the water is kept at the proper level in the boiler. If the water, by intention or accident, falls below the fire plate, so as to allow it to become highly heated, this metal will melt out, and the orifice will discharge steam into the fire arch.

There would, of course, be inconvenience arising from such an occurrence, because the necessary repairs cannot be made without access to the inner surface of the boiler. But to workmen and passengers this inconvenience is the price of safety, and in reference to the engineer it is the best pledge of his fidelity. The rank of an engineer has become such, that but few men of careless or dissolute habits are thus employed. They are generally sober, well informed and trustworthy, and therefore do not need to be thus watched. This class of engineers however do not object to being watched. But an ignoramus or a desperado will sometimes get employment in this capacity. It is therefore to be expected that some engineers will object to carrying such informers of their remissness as the fusible metal would be. But the public have interests of their own to which they ought to look.

We are informed that about two years since Massachusetts required by law, that all steam boilers should be supplied with a rivet of fusible metal in the fire plate, and we are not aware that any explosion has occurred since that time within her limits. In the Report of the Commissioner of Patents to the Senate, about a year since, it is stated that a similar law has existed in France for twenty five years, and that explosions scarcely ever occur there. There is an urgent necessity for a law of the kind in this country, and for such a supervision that the law cannot be evaded.—N. Y. Recorder.

Counsel to Inventors.

In the Mining Journal of February 23d, there appeared a notice of a work on *Copyright in Design in Art and Manufacture*, from the pen of Mr. T. Turner, of the Middle Temple, which we spoke of as a lucid work on the subject, and one which was likely to prove a useful companion to the lawyer, patentee and inventor. We have now before us another letter on a similar subject by the same author, who has evidently made himself master of its general principles, under the title of *Counsel to Inventors of Improvements in the Useful Arts*. Mr. Turner, in his preface, states that the volume is addressed to those who belong to, or connected with a class at once denoted and reproached by the term "projector," to whom we owe no small portion of our national prosperity; its aim being first—to off some suggestions as to the cultivation of the fields of useful invention, and the settlement of new tracts of its territory; and second, to exhibit the inventor's legal position in the general features of its privileges and conditions. The first of these is generally dealt with under the head of the value of invention, comprising inventors, inventions, the value of, and their natural and artificial limits, with the kind of remuneration which has generally been awarded them; and the second, under the head of property in invention, comprising the rights of inventors, a general and well classified consideration of patents, and what is patentable, with registration, specifications and proceedings. In speaking of the moral qualities of an inventor, necessary to insure success, the author says:

"Every object that occurs must be cross-examined, to learn something from it suited to the purpose in hand, every stone turned that may have knowledge under it. Glauber's rule, it is said, was to examine what every one else threw away; and it is obvious that the inventor must succeed by seeing deeper into, or farther off, or more widely, or from a new point of view, the same objects that are visible to all. Sir J. Herschel prettily describes the various parts which iron plays in the thoughts of different men. With the vulgar an incombustible.

The chemist not only burns it rapidly, but esteems it, from its affinity to oxygen, a decidedly inflammable element. It is the poet's emblem of rigidity, the engineer's most plastic material; the goaler values it as an obstruction, the electrician as the freest of communicators. He might have added the physician, who knows it as a means of invigoration, and the warrior, whom it enables to devastate and destroy, while the astronomer would find its highest interest in its presence in the meteoric stone, to him a sample of the mineralogy of distant worlds and systems. So Crompton witnessed a process of rolling iron; he saw in it a mode of spinning cotton filaments. Sir R. Seppings observed the framework of a Swiss bridge; he adopted the principle of it into the dockyard, and revolutionised shipbuilding by his diagonal framing, the substitution, viz: of systems of triangles, the strongest rectilinear combination, for the square, which, at every strain of the ship, racked itself to pieces.

There are, throughout the volume, some well-timed allusions to, and extracts from, some of our most popular writers on scientific subjects, such as Babbage, Baines, Ure, Whewell, Faraday, Bentham, and others, which apply most correctly to the subject. Among these, we cannot resist the opportunity of quoting the following from Mr. Babbage's work on manufactures, of which the author has availed himself; it shows, in a striking point of view, the facilities afforded by Nature for the production of all our mechanical results, and how necessary it is for an inventor or projector to make himself acquainted with the most minute details of the properties of matter to arrive at success:

"With reference to the kinds into which artificial processes are divisible, the most systematic treatment of the subject will be found in Mr. Babbage's work on manufactures. One main distinction separates. 1. The power-affording machines; and here one section must be set apart for animals, which (as horse power) often precede, and are used to measure forces substituted for them; and then the section of inorganic agents will consist of elements, wind and waterwheels, and of automata, such as those of steam, gunpowder, galvanism, in which we seem to make power, or rather we call it forth from a dormant state, and, unlike Hotspar's assistants, it comes when we call it. In the elemental section we find the force sweeping down the channel, or over the country, and merely arrest it and change its direction by the windmill, sail, or waterwheel. 2. Having from any of these sources an amount of power under control, we expend it on saving us time and trouble; thus, the copper wire supplies us electricity, but conveys it from place to place to write our letters for us. Having got the power into the waterwheel or axis of the sails, the millstones grind by it the corn. Mr. Babbage's third section, arts that economise natural properties, can hardly be co-ordinated with these. Glass making might be an example of it, in which the rubbish that strews the shore, the seaweed, Byron's emblem of worthlessness and neglect, aids us to rival Nature's choicest rarities, and with the abundant plenty of the furnace to outvie the crystal of the cave. We shall avail ourselves in part of the same author's more elaborate classification of machines (and tools, which admit of no definite line of demarcation from them), according to the services they render. The heads are, 1. Those that store up power, the fly wheel. 2. Those which regulate it, the steam governor. 3. Economists of material, the saw (at least, in comparison with the hatchet, for it is itself inferior to a blade, which, under machine power, slices off a veneer, without the loss of a grain of saw dust.) 4. Economists of time, as when hammers are arranged to strike a rapid succession of blows 'while the iron is hot.'—Another proverb is still open to verification by some future engineer, who may set steam power to turn all the hay 'while the sun shines'; science has already, by its barometer, gone far toward telling when it will shine. 5. Clocks, which take in power in the mass, and retail it out in small parcels. 6. Time savers in certain physical changes in bodies, as bleaching, tanning, seasoning timber, etc. It is worth notice, that Nature does not always like to be hurried, and the result exhibits an inferiority to that obtained by leaving to her own pace. Our shoes are not made now with the leather of the good old times; and the same chlorine which so

rapidly takes all the stains out of the linen takes out some of the strength. It is not certain that the long years spent on some of our old buildings had not, like the slow growth of a timber tree, a share in giving them durability. A result obtained too great for the mere muscular power of man. Mr. B. instances a Bramah's press, by which, on one occasion, a workman, exerting a pressure equal to 1500 atmospheres, burst a 3-inch thick iron cylinder. This is in reality only a variety of the first class, both being cases of accumulation. 7. As the human arm fails in power, so human sense, unassisted, fails in delicacy; hence means of filtering, singeing off the down of lace, and again, magnifying instruments for the eye. 8. Counting machines, inanimate bookkeepers and historians. The most splendid instance is the calculating engine, which, in its fullest development, is due to Mr. Babbage. There are many minor ones, as the gas meter, and the tell tale, which ensures the fulfilment of the watchman's rounds. 9. Means of identity in copies, and accuracy in all cases. We can only notice briefly the arts of reproduction; printing on surface; moulding on forms; copying with variation of size, as the pentagraph; of form, as the lathe, allied to which is the printing cylinder; and of reversed symmetry, as when a right handed shoe last guides the cutting of its fellow. All these are highly illustrative of the importance of repetition as a ground for employing machinery, and in most of them the cost of the original infinitely exceeds that of the copy. One engraved steel plate has yielded 80,000 impressions, and the last was perfectly interchangeable with any of its predecessors. If 80,000 copies be insufficient, Perkins' process, or the electrotype art, will copy the metal plate itself, and supply any multiple of 80,000; and where less minute delivery is needful, even this estimate is exceeded. It is said that in the Times office a type does not get its discharge, till it has gone through its exercise, 14,000,000 times."

We cannot further follow our author through his interesting volume, which will be read with interest by every lover of science, and while thousands of facts are collected, which bear immediately on the subject under notice, the whole is contained in only 100 pages—a task at which we think no reader can be wearied. The following is his concluding passage, and is from the Edinburgh Review:

"When a principle is fairly studied, inventions are simultaneously made in many places at once; the electric telegraph, screw propeller, and a host of others, are disputed by an hundred rival claimants; chance, we thus perceive, did not produce those discoveries, nor could it, therefore, have prevented their production; will directed education will make the creations of the human mind more abundant, as printing has already secured their indestructibility."—*Mining Journal*.

New Application of Steam Power in Navigation.

We have had an opportunity of examining the new application of steam power in navigation, for which the ingenious inventors, the Messrs. Ruthven, of New street, have secured patents both in this country and in the United States of America. The disadvantages of the paddle wheels in steam vessels are too well known to require enumeration. The attention of the Messrs. Ruthven, of Edinburgh, whose names rank high as engineers, has, it seems, for a long period been directed to this subject. The result has been the discovery or application of a new method of propelling and navigating steam vessels. The arrangement consists in the forcible expulsion of water from a nozzle or bent pipe at each side of the vessel, which is effected by the power of the steam engine. The form and properties of a sailing vessel are preserved, there being no projections on the hull in the form of paddle boxes or otherwise. Under the engine, which is placed in a horizontal position, is a round iron case, in which there is a wheel, having a shaft through what is termed a stuffing box, on the upper or outer side. The piston of the steam engine is attached to the shaft cranks, and the steam power is applied wholly to revolving the wheel in the iron case, which, being made something like a fan wheel, carries the water with it in its revolutions. The water, in obedience to the laws of centrifugal

motion, presses towards the outer rim of the case with a force proportionate to the speed, and escapes by an aperture and pipe at each side, whence it is discharged by the nozzle or bent pipe, into the sea. The water is supplied to the iron case by a large flat pipe, which has a free communication with the sea by means of apertures in the bottom of the vessel. The nozzle is above the water line, and can be turned by the seamen on deck with the greatest facility, so as to discharge the water either towards the bow or stern. Discharging the water a-stern, makes the vessel go a-head; when discharged towards the bow, the vessel goes a-stern; and when discharged downwards, the vessel remains stationary. These operations are effected without the engine being altered or stopped—a material improvement on the paddle wheel; and as the elevation of one nozzle is rapidly altered independently of the other, ample facilities are given for turning the vessel. The absence of obstruction on the hull enables the vessel to use sails with as much effect as a common sailing vessel; while the steam power may be perfectly combined with the action of the sails—an advantage denied to a steam vessel, except to a limited extent. It is difficult to convey an adequate idea of the improvements without an inspection of the mechanism—an inspection, however, for which Messrs. Ruthven are anxious to afford every facility, having constructed a model of a vessel, 12 feet in length, for the illustration of the improved method of propulsion.—*Edinburgh Evening Courant*.

Scotch Pig Iron Trade.

Having from time to time observed articles in your Journal, in reference to the production, cost, etc., of Scotch pig iron, which are calculated to mislead, and knowing that you wish to correct error and advance that which is correct, for the information of your subscribers, I am at length determined to address you on the subject, having hitherto refrained, hoping that some other parties might do so; but as several articles have also recently appeared in the local papers, having a tendency to depress the trade, and destroy the confidence of parties at a distance, I beg to make the following remarks:

At the close of the year, the stock of pig iron in Scotland, in makers' and storekeepers' hands, was variously estimated from 165,000 to 195,000 tons—the former quantity being the nearest correct; and as the present price of iron is not remunerating to the makers, it is not at all likely that any more furnaces will be put in blast; it may therefore be safely assumed that the make for the present year will not exceed 640,000 tons. The foundries in this neighborhood being much better employed this year than during the last, as also the Malleable Iron Works, it may confidently be expected that, should the export demand only keep pace with that of last year, though in all probability it will be considerably more, as Scotch pig iron is finding its way into almost every market in the world, there will be a reduction of stock at the close of the present year, instead of an increase. Our local newspapers insert from time to time the shipments from Glasgow, and draw comparisons therefrom; but owing to the large quantities of iron now shipped at the outports, conveyed there by railway from this, the exports from Glasgow are no criterion. Shipments direct from this have fallen off this year, owing to several reasons. The first, very boisterous and bad weather in the months of January and February, and great scarcity of vessels, which continues in some measure to the present time; and from foundries, etc., in Lancashire and the north of England having drawn their supplies from Runcorn and Fleetwood during the time of low charges by the railways and canals, so that the stocks at these places are reduced. They have at present through those districts been working on their supplies, and when they require to come into the market again, they must look in a great measure to Scotland.

From the foregoing, it will be seen that the prospects for Scotch pig iron are far from gloomy; and when the extraordinary enterprise of our engineers is considered, whether in the construction of tubular bridges, in shipbuilding, as also in housebuilding, it may reasonably be expected that the demand will fully keep pace with the increased production

and a fresh impulse will be given to the industry of the country.—*London Mining Journal*.

Production of the Precious Metals in Russia.

[The following are extracts from the report of the Austrian Commissioners on the Exhibition which took place last year in St. Petersburg.]

Precious Metals.—The wealth of Russia in precious metals is known to be very great. The mines are situated principally in the Ural and Altai mountains, and the lower range of hills which surround Nertschinsk, in Siberia.

Gold.—This is always an interesting topic, but doubly so at the present moment, and we shall, therefore, quote the report of the Austrian commissioners respecting it rather fully. The mines in which gold is found belong partly to the imperial domains, and partly to individuals; they are found in the largest numbers in the neighborhood of Katherinenburg, in the government of Perm, which is the seat of the superior administration of all the mines of Perm and Siberia. Gold washings exist in the district of Wertschourie, in the government of Perm. Large quantities of gold are also found in Eastern Siberia; the first discovery of its existence was made in 1829. The mines on the Ural were not worked until 1814, and those on the Altai not before 1830. The gold found in the sand is of various forms and weights—pieces weighing 16 and even 24 pounds have been discovered; but the shape in which it is chiefly found is a fine sand.—The mines in Siberia can only be worked during four months; and the gold hunters are compelled to obtain a license from the Minister of Finance.—The crown has a royalty of from 20 to 24 per cent. on all gold found, and every pound of gold pays four roubles for police and other purposes. The import and export of gold in all shapes is duty free. It cannot, however, be exported from the western frontier of the empire. The annual publication of the St Petersburg Academy, for the year 1849, contains the official returns of the amount of gold obtained in the year 1847. The following table refers only to the mines on the Ural, which, it will be seen, are by no means so productive as the mines in Siberia:

From the Crown Mines on the Ural.

Katherinenburg.....(poods)	35
Slatoust.....	48
Bogoslawsk.....	34
Gowblagodatksk.....	10—127

From Private Mines.

Werch Isetsk.....(poods)	48
Kactinsk Kaschtinsk.....	13
Nischne-Tagilsk.....	28
Sysert.....	27
Newiansk.....	10
Schaitansk.....	6
Bilimbajewsk.....	2
Krestowoswishensk.....	18
Weewoloshskisch.....	6
Werchne Ufaieisk.....	2
Itabansk.....	10
Other mines.....	18—196

Siberia produced in the same year the enormous quantity of 1456 poods. In the previous year the produce was 1677 poods.

Platina is found in the Ural Mountains; the mines being worked by the government and by private persons. The quantity produced annually has decreased very much of late years; in 1838 it averaged about 40 poods, while in 1847 it did not amount to 2, and in the following year only very little more. The present price is about 3600 silver roubles per pood. The exportation of this article is entirely free; manufactured platina is subject to an *ad valorem* duty of 25 per cent. France is the chief recipient of the platina exported from Russia.

Silver is found in the Altai and Nertschinski mountains. The latter produce on an average about 207 poods annually. Some silver mines exist also in the Ural Mountains, but were only discovered in 1834. It may be imported and exported duty free, with the exception of exportation on the western land frontier. The total quantity of silver produced in 1846 was 1191 poods.

The various articles manufactured from the precious metals are described as of high finish and great elegance. The silver articles were more par-

ticularly remarkable. This branch of industry is a very ancient one in Russia, and is principally distinguished for the remarkably fine silver chains that are manufactured in large quantities in Ustjug Welski, a town in the government of Wologda.—These chains are not thicker than an ordinary thread, and are worn by the lower orders to suspend their crosses on. They are principally made by women. Gold and silver articles pay an *ad valorem* import duty of 35 per cent. The plated articles exhibited were held by the Austrian commissioners to be a convincing proof that Russian industry has rendered Russia independent of the foreigner in this branch.—*Min. Jour.*

Providence Railroad.

The following report by the directors of this corporation is certainly a model for brevity. It is reported in the street that the July dividend will not be more than two and a half per cent upon the par of one hundred dollars per share, and this has caused the recent decline in the market value of the stock. The friends of the road, however, contend that there is little doubt that henceforth the regular half yearly dividends of three per cent. will be earned and paid to the stockholders.

Report to the Annual Meeting, June, 1850.

The directors present their annual report to the stockholders.

In the report made at the last annual meeting, a full statement was given of the operations of the corporation, in reference to the large expenditures which have been made on construction account, since April, 1846, and of the reasons which influenced the directors and stockholders in entering upon them; and it is deemed unnecessary to repeat here what was then said.

During the past year, no extraordinary expenditures have been made, and, in the opinion of the Directors, the interests of the corporation will, hereafter, require none on construction account. In their opinion everything has been done which it was necessary to do to complete the road, and everything which can be done to protect it from further injurious competition.

The competition from other lines of travel for a portion of our business, has been very severe, and we have felt the effects of it in our operations of the last year.

The receipts for the year ending July, 1850, (estimating the receipts for May and June, to be the same as in the corresponding months of 1849,) will be \$349,870 93; and the expenses, (estimating as before, and including all payments of interest,) \$179,870 93.

For the six months, ending July 1st the receipts will be \$166,950, and the expenses, \$87,626 29.

The receipts of the corporation, as compared with the preceding year, have fallen off \$15,555 85, and the expenses have been reduced \$7,682 77.

The capital stock has not been increased since the last annual report; but bonds of the corporation have been issued to the amount of \$207,000, payable in five years after date. The interest which has accrued upon these bonds, and which will accrue before July 1, is included in the statement of expenses made above.

The West Roxbury branch is now completed, but there are claims for land damages still unjust—some of them of considerable magnitude, which renders it impossible to say what will be the exact state of the affairs of the company when they are liquidated.

In the opinion of the directors—estimating as well as they are able to do, the amount of these damages—these debts of the corporation, after the payment of the July dividend, will be about \$300,000, including the amount of bonds already issued.

We have land in Roxbury, Canton, Pawtucket, of the estimated value of \$25,000, which is not needed for the purposes of the road, and which may be disposed of without injury to its interests.

We have also \$40,000 of the capital stock of the Stoughton branch railroad.

During the year, freight houses have been built at Mansfield and Attleboro'.

It has always been the policy of the managers of this corporation, to keep the roads and buildings in

perfect repair, and their present state is entirely satisfactory.

During the year, the trains upon the road have been run with great regularity, and with such a degree of safety, that no passenger has sustained the slightest injury.

At the late session of the Legislature a charter was granted, authorising the construction of a railroad from South Dedham to Boston. The completion of this road would, probably, affect the interests of this corporation to a very slight extent.

If the whole business of the Norfolk county road now brought upon our road, should be transferred to the new corporation, the loss to us, as appears by the experience of the past year, would be somewhat less than \$4,000. To this extent, the new road would be a competitor with ours. It would also be a competitor with the Norfolk County road—as all business carried to it from that road at South Dedham, would involve a loss to the Norfolk County road of the profits of transporting passengers and freight upon five miles of their road—the distance from Dedham to South Dedham.

Whether the managers of the Norfolk County road would transfer their business to the new corporation, at the sacrifice of their profits upon nearly one-fifth of their road, will be a matter for them to determine. Of course, they can have no inducement to do so, unless the new corporation can offer them so much better terms as will more than compensate them for the loss of one-fifth of all their through business. If such terms are to be offered, the experience of our corporation will enable the stockholders to judge of the probability of the construction of the newly chartered road, and the public to form an opinion as to its value, should it be built.

C. H. Warren, Wm. Appleton,
John Barstow, G. R. Russell
Wm. Amory, William Dwight.
May 25, 1850.

Indiana.

Wabash Navigation Co.

We copy from the Cincinnati Gazette the following account of the operations of this company, which has for its object the improvement of the Wabash river, by making slack water over the rapids at Vincennes:

The Wabash Navigation Company was chartered by Indiana and Illinois in the winter of 1846 and 1847; preparations for the work were made in the fall of 1847, and it was intended that it should be completed in the fall of 1848. The lock was completed, and the dam was nearly finished, when all work was stopped by the flood, and a part of the dam was washed away; in the fall of 1849 the work was resumed, and the dam was completed about the first day of November last. The lock is the largest in the world, being sufficient to pass a boat fifty feet in width and two hundred and thirty feet in length; a little wider and considerably longer than the Louisville lock. The stock of the company is mostly owned at Vincennes. In consequence of the partial destruction of the dam in 1849, at certain stages of the water, steamboats and flatboats could not safely pass through the dam. But the dam as it was, did increase the water on the rapids; and hence at certain other stages of the water the lock was used; and hence too, there was an increased steamboat navigation on the river in 1849. Steamboats passed the lock at the rapids of the Wabash in each month of the year 1849. The following statement is taken from the reports of the Collector of tolls, on file with John Ross, Esq., secretary of the company. The steamboat passages through the locks in each month of 1849, were as follows: January, 8; February, 11; March, 35; April, 35; May, 26; June, 4; July, 2; August, 4; September, 2; October, 4; November, 3; December, 36—total 152 passages, or 76 steamboat trips up and down, proved by the tolls paid. How many passed through the breach in the dam is not known—but probably as many more. The following is a continuation of the above statement to the last report: January, 1850, 51; February to the 23d, 45—total 96 passages. And the following is a statement of the whole business for the present season: November, 3; December, 36; January, 51; February to the 23d, 45; total 135 passages. The writer has himself seen lately the following boats in the

Wabash with full cargoes loaded for, or at, New Orleans; Tribune, Globe, Dove, North Carolina, and Warrior. On the evening of the 20th February, there were three boats at the Vincennes landing; one from New Orleans, one from Cincinnati, and one from Lafayette; at the stage of water at that time, but for the dam there would not have been more than three feet six inches on the rapids. It is well known here, that Vincennes packed pork, shipped by steamboat to New Orleans, was on sale at Boston on the 1st February—and from the reports above mentioned it appears that toll has been paid this season on 4,115,131 lbs. of bulk pork, and on 36,647 barrels of pork; less than half the quantity packed on the river."

A report made some time since the statement of our correspondent came into our possession, shows the business of the Wabash improvement for a period of five months—commencing on the first of December last, and ending on the first of May.—The total number of steamboats that passed the lock within this period, was 245; the total number of flatboats, 140. The number of passengers moving up and down during this time, is stated at 2,650.

Among the articles of freight passed through the lock during the period of 5 months above specified, were 50,735 bbls. of pork, 7,666,578 lbs. bulk pork and bacon, 1,994,645 lbs. lard, 1,483 live hogs, 129 cattle, 1,974 dozen poultry, 325,794 bushels corn, 1,000 bushels wheat, 55,092 bushels oats, 1,484 bushels rye, 82 bushels barley, 18,613 bbls. salt, 6,278 sacks salt, 1,290 bbls whiskey, 3,065 bbls. molasses, 7,339 bbls. flour, 161 bbls. apples, 2,652 bushels potatoes, 319 bbls. lime, 934 tons hay, 145,338 feet lumber, 20,000 staves, 21,185 hoop poles, 8,574,081 lbs. merchandise, groceries, etc.

The descent of the Wabash at Vincennes, is about 9 feet within a distance of three miles. The height of the dam raised is 13 feet, which gives the supply of $4\frac{1}{2}$ feet of water in the channel over the rapids, when the river is at its lowest stage. We wish to call to this fact, the particular attention of the "well enough but tardy" friends of a railroad communication between Cincinnati and the Wabash valley. By the excellent improvement at Vincennes, boats 50 feet wide, 230 feet long, and drawing $4\frac{1}{2}$ feet water, can navigate the Wabash at all seasons of the year when there is no obstruction by ice.

Jeffersonville and Columbus Railroad.—The annual election for directors of this company took place on Monday, and resulted in the choice of the following gentlemen: Jas. Guthrie, Wm. A. Richardson, and James Keigwin, of Louisville, Dr. Colum, Woods Mabury, A. Wathen Geo. Savitz, Henry French, Samuel Merriwether, and Wm. D. Beach, of Jeffersonville, Mr. Kester, of Jackson county, and Mr. Irvin of Bartholomew county, Indiana.

We learn that by Wednesday or Thursday of this week, the water will be let into another division of the Wabash and Erie Canal, between Terre Haute and Point Commerce, a distance of forty miles. Mr. Butler states that the section between Terre Haute and Point Commerce, now ready for navigation, is most substantially built, and such is the character of the soil through which it is built, he thinks the canal will as soon as the water is let in, be ready for navigation. The above addition will make the whole extent of the Erie and Wabash opened for business 350 miles.

Illinois.

The Alton (Ill.) Telegraph of the 7th ult. says:

We are much gratified to be able to inform our readers that J. B. Danforth, Esq., one of the eastern

directors, A. T. Cowman, Esq., principal contractor, and Isaac Gibbon, Esq., secretary of the Alton and Sangamon railroad company, arrived in this place a few days since, from New York, and are now, in connection with the local directors, engineers, and other officers, making the final preparations for the immediate commencement of the work. The line between this city and Brighton, we understand, is nearly or quite ready to be put under contract; and we trust operations will be commenced without delay.

Aurora Branch Railroad.—J. L. Hanchett, Chief Engineer, made a report on the 21st ult., relative to this road, from which we learn that the amount now under contract is \$16,086.

Every exertion has been made during the winter to procure timber for the superstructure. A great number of logs have been delivered at different mill yards along the line, of suitable lengths for rails, in case the flat iron should be adopted. The timber has been procured at different points for bridge purposes, and ties for the whole length of the road have been contracted for, which are rapidly being delivered on the line.

The contracts for grading the first $11\frac{1}{2}$ miles provide that the first six miles shall be completed by the 1st of June next, and the balance by the 1st of August following. Should the iron be procured in time to lay it down as soon as the grading is done to Batavia, 6 miles may be in readiness for business as early as the 4th of July next, and to Aurora about the 1st of October next.

The amount of furniture that this company will require for doing business in connection with the Union road, will vary not far from \$16,000. Temporary buildings and water stations at the Junction, Batavia, and Aurora, \$3,000.

The estimates for the whole, amount to \$92,608, as follows:

Grading, bridging, etc.....	\$34,054
$13\frac{1}{2}$ miles superstructure, (flat rail).....	33,054
Distributing materials, laying track, &c.....	6,500
Amount of furniture required.....	16,000
Temporary buildings and water stations..	3,000
Right of way and fencing.....	3,000

Total.....\$92,608

In case the T rail should be adopted, the cost of the road will be increased some \$40,000.—*Chicago Democrat.*

Ohio.

Railways around us.—Our neighbors at Louisville and Maysville are pushing forward with commendable energy their railway connection through Lexington and Frankfort, and the Alabamians and Tennesseans are engaged in the construction of a railroad to intersect this line, which will connect the south with the Ohio at Maysville and Louisville. There is, it is true, a preferable route for a railway connection of the Ohio with the heart of Kentucky and the south, from Covington opposite this city, to Lexington, though but little is effectually done to push on the work. The people of Kenton county by a large majority, determined to tax themselves to aid this road, but we understand that the County Court have refused to make the assessment necessary to carry out the vote of the people! If this road is delayed much longer, the other roads will be first completed, and have diverted much trade and travel, which it will be very difficult to regain.

The iron for the road from Dayton to Greenville will be ready and laid down in a short time.

The road from Dayton to Springfield is nearly ready for the cars.

One third of the grading on the road from Ham-

ilton to Eaton will be done by the middle of July.

The continuation of the road from this city to Hamilton is progressing very rapidly, and the iron is coming forward in time to be used, as soon as the road is ready.

The Little Miami road is being thoroughly repaired, and straightened, and the flat bar is giving place to the heavy T rail.

Strong efforts are making to push on the road from Pittsburgh to and through Bellefontaine to Indiana.

And our friends in the Scioto valley are busy in completing the arrangements to commence the Belpre road east of Hillsborough.—*Cincinnati Gazette.*

Central Railroad Lettings.—The directors of this road—including Mr. George M. Parsons and W. Dennison, Jr., both of Columbus, have been engaged for the last two or three days in examining the bids, and awarding the contracts on that portion of the line between Zanesville and Newark. The contracts are made at what we should think very fair prices. The bidders are men of character and sound experience in the business of road making.

At the same meeting of the board the following resolutions were adopted:

Resolved, That a committee consisting of the President and Geo. M. Parsons, Esq., be appointed, to proceed at once to Springfield and Dayton, for the purpose of enquiring into the propriety of extending the line of operations, westward from Columbus.

Resolved, That the board meet at the Neil House, in Columbus, on the 26th day of June next, and that the adoption of the line of our railroad into Columbus shall be made at that meeting; provided, however, that no location shall then be made unless one hundred thousand dollars of available subscription to the stock of the Central Ohio railroad company, be provided in Franklin county.

That portion of the directory residing in Columbus, have not heretofore been in the habit of attending the meetings of the board in Zanesville. We were pleased to meet them here on this occasion, and we were specially pleased at the deep interest they manifest in the prosecution of this great work. We hope it augurs well for our future success.—We now feel confident that two years will not elapse until Columbus and Zanesville will be bound together firmly, and to the advantage of both, by a band of iron.

We trust that that our friends between this and the Ohio river, will at once catch a little of the flame that is beginning to burn west of us.—*Zanesville Cour.*

Pennsylvania.

The Lebanon Valley railroad project is going ahead. It is a rich and beautiful valley, and considered merely as an outlet for its agricultural produce, we think the road would pay expenses. But there is an abundance of iron ore in the valley, as also limestone, which, added to the accessibility of coal at all seasons, give it important advantages for iron manufactures. If the iron trade ever revives, Lebanon valley must become widely known for its manufactures. We passed over the route the other day, and have made up our mind that the road will pay, and that it ought to be made. We learn from the Courier that the whole of the stock of the North Lebanon railroad company, was taken on Monday week, by the Messrs. Coleman, but that the work upon it will not be commenced until it is ascertained what will be the location of the Lebanon Valley railroad, with which it is designed to connect.—*Miner's Journal.*

New York.

Troy and Schenectady Railroad.—The following gentlemen were, at a recent meeting of the Common Council, designated as the directors of this road: Elias Plum, Russell Sage, Hiram Smith, T. Symonds, Griffith P. Griffith, Hiram Slocum, E. Carpenter, D. T. Vail, Thomas Bussey, Benjamin Hatch, Uri Gilbert, Wm. D. Haight and Harvey Davis.

Northern Railroad.—The Champlain and Ogdensburg railroad is completed to Chateaugay, 45 miles and the cars leave that place every evening at 6½ o'clock, and Rouse's Point every morning at 3¼ o'clock. Passengers by this route arrive at Ogdensburg in the evening by stages from Chateaugay.

Virginia.

Central Railroad.—The counties of Greenbrier and Monroe have each voted a subscription of \$50,000, for the purpose of aiding the construction of the above road from Augusta to Covington.

The State has authorised a subscription of \$420,000 to the above work. From the liberality with which the work is encouraged by the people along its line we see no difficulty in the way of its early construction.

Col. C. F. M. Garnett.

Since our last notice of this gentleman, we have learned more distinctly the nature of the appointment with which he has been honored by the Memphis and Charleston railroad company. He has been selected as the Engineer-in-Chief of that great work, and has accepted the appointment, with the understanding, that he will devote as much time to the duties of the office as he can consistently with his obligations to the Virginia and Tennessee railroad. The arrangement made is highly satisfactory to our board of directors. The board, and Col. Garnett also, rightly consider the Memphis and Charleston railroad as but a prolongation of our road, and that we are all deeply interested in its speedy construction. When finished, even if initiatory steps had not already been taken, the construction of a road, to connect it with the western terminus of our road, would be inevitable. Tho' constructed by different corporations, the line from Lynchburg to Memphis will be, in fact, one great work.

The appointment thus conferred by those who have had the most ample means of judging of the merit of Col. Garnett, with the knowledge that only a small portion of his personal supervision could be given to the work, is the highest testimonial which his friends could ask of his professional standing.—*Lynchburg Virginian.*

Origin of Coal.

The immense beds of bituminous coal found in the valley of the Ohio fill the mind with wonder.—Age after age, successive growths of plants, springing up in the same region, were entombed beneath thick strata of shale, to the depth of more than 1,000 feet; while beneath the whole lay the bed of an ocean, floored with fossil salt. Indications of coal are found at intervals, across the great valley, from the Allegheny to the Rocky Mountains. It is found near the surface in Ohio, Kentucky, Indiana, Illinois and Missouri, and without doubt may be found beneath the extensive territory deposits which form the substratum of the great prairies in the central and northern parts of the Western States. As low down as New Madrid, on the Mississippi, coal was thrown up from beneath the bed of the river, by the great earthquake of 1812—a sufficient proof of its continuation in the most depressed part of the great valley. That the coal is of vegetable origin, no one who has read much on the subject or personally examined the coal beds, will deny. Time was when it was considered a peculiar mineral product, formed in the same manner and at the same time, with the rocks that surround it. The product of its chemical analysis, being altogether vegetable, and the artificial formation of coal from wood by Sir James Hall, have silenced all doubts on the

subject. The only mystery now is, how such vast quantities of vegetable matter could be accumulated and grown on the spot where they were buried. That they grew in general on the surface now occupied by the coal appears certain from the perfect state in which the most delicate leaves and stems are preserved. Had they been transported by currents of water and especially from any distance, it is hardly possible that they should not have received more damage. The climate at that period must have been more humid than at present, as many of the plants are of those families which now grow only in tropical climates, and as the laws of nature never change, this may be deemed a correct inference.—*Silliman's Journal.*

Banking Capital of Massachusetts.

At the late session of the Legislature of Massachusetts, nine new banks were chartered, three of which are located in Boston, with capitals amounting to \$1,400,000, the other six are small ones, with an aggregate capital of \$600,000. This adds two millions to the banking capital of the State.—The annexed statement gives the amount of the banking capital employed in Massachusetts:

The bank capital of Massachusetts, paid in, as per last annual report, was, in October, 1849.....	\$34,630,011
Since which time the following additions have been made—	
Boston, Suffolk co. Cochituate bank...	150,000
" " Shoe and Leather Dealers'	2,505
Haverhill, Essex county, Haverhill bank	300
Haverhill, Essex county, Union bank	100,000
Lynn, Essex county, Loughton bank	9,250
Lawrence, Essex county, Bay State Bank	58,100
Fitchburg, Worcester county, Rollstone bank	100,000
Milford, Worcester county, Milford Bank	100,000
Greenfield, Franklin county, Franklin County Bank	40,884
Springfield, Hampden county, Western Bank	43,950

Actual bank capital of Massachusetts April, 1850	\$35,235,000
To which will be added the following during the year 1850—	

NEW BANKS CHARTERED, 1850.

Bank of Commerce, Boston.....	\$750,000
Bank of North America, Boston	500,000
Haymarket Square Bank, Boston	150,000
Rockport Bank, Rockport, Essex county	100,000
Prescott Bank, Lowell, Middlesex county	100,000
Abington Bank, Abington, Plymouth county	100,000
Tradesmen's Bank, Chelsea, Suffolk county	100,000
Mariners' Bank, Danvers, Essex county	100,000
John Hancock Bank, Springfield, Hampden county...	100,000
Total	2,000,000

Total

This shows an increase in the banking capital of the State, within a period of less than twelve months, of \$2,600,000.

Georgia Bituminous Coal.

We are informed that an inexhaustible bed of coal exists in Walker county, just beyond the tunnel and very near the railroad.—*Augusta Constitutional.*

The coal bed spoken of in the above paragraph is within a few miles of this place and is very rich. Another bed of coal has recently been discovered in our county, some eight or ten miles west of Ringgold. The coal taken from this last mentioned bed has been pronounced by competent judges

to be of the first quality. We have examined this coal, and have seen it tested, and are satisfied that it is as good as any of the Northern article. These beds are said to be inexhaustible. We have not ascertained who are the owners of this valuable property.—*Ringgold Republican.*

New York Custom House.**Imports for May.**

	1850.	1849.	1848.
Dutiable	7,492,958	5,779,628	5,087,279
Free	806,216	887,180	1,283,754
Specie, etc.	2,883,623	1,137,932	133,922
Total	\$11,184,797	7,804,740	6,504,955
Withdrawn from warehouse....	742,914		

\$11,927,711

Exports for May.

	1850.	1849.	1848.
Domestic merchandise.....	3,610,971	3,020,861	1,900,970
Foreign free	36,401	63,499	3,215
Foreign dutiable...	310,231	488,492	207,322
Specie, etc.	741,735	373,916	2,449,253
Total	\$4,699,344	3,946,769	4,560,760

The amount of revenue collected has been as follows:

	1850.	1849.	1848.
May	2,319,868	1,461,817	1,304,607
Total from Jan'y. 11, 575,728	8,996,058	9,237,631	

The imports in May were over four millions larger than in May last year, of which increase, however, over two and a half millions was in specie and bullion. The exports of domestic produce show an increase of six hundred thousand dollars, notwithstanding the holding back of cotton. They are nearly twice as much as in May, 1848. The fiscal year will close on the 30th of the present month, and the following table of the movements of the eleven months indicate very nearly what the result of the year will be:

Imports July to June.

	Dutiable.	Free.	Specie.	Total.
1850.	\$80,130,420	7,376,027	9,267,433	105,773,880
1849.	73,526,047	7,684,147	2,685,637	83,395,831
1848.	77,594,047	7,657,938	1,103,874	86,355,859

Exports July to June.

	Domestic.	Foreign.	Specie.	Total.
1850.	\$29,256,469	4,939,461	5,004,669	39,200,599
1849.	29,908,679	3,169,023	4,033,462	37,111,164
1848.	31,403,000	2,534,367	10,056,879	43,994,246

Prevention of Explosions in Steam Engines.

In the Journal of the Franklin Institute, for February, there is a suggestion by Mr. A. C. Jones, C. E., for preventing explosions in steam boilers. Having had long experience with the engines of the Mississippi boats, the writer is convinced that the majority of accidents happen through gross neglect or ignorance; he, therefore, repudiates all nostrums, such as fusible alloys, floats, balance-valves, &c., and merely lays down a few rules to be carefully followed, which, during 35 years' practice, have prevented any accident to the engines under his charge. He advises—1. To carry the water as high as the boiler will allow, without working over into the cylinder.—2. Never increase the pressure of steam to overcome the loss of power by leaks in the joints, disarrangement of the valve gear, etc.—3. If, by any unforeseen cause, the water gets too low in the boiler, avoid pumping in water, or raising the safety valve suddenly, or by any other means disturbing the surface of the water, kept smooth by pressure; but damp the fire at once, and allow the boilers to cool down below their working temperature; if time is an object, now throw in a very small quantity of water, and note its effect on the safety valve; if sufficient time has elapsed, the lever will get heavier; the pump may then be set at work, and a slow fire started, limiting the supply of water so as not to cool the boiler too soon. It is well known, by an experiment with an iron ladle heated to redness, by throwing in water, it is not converted into steam until

the iron has cooled down to 212°, when it instantly flashes into steam. If a boiler is in this condition, and sufficient water is suddenly thrown in, an explosion is inevitable.

AMERICAN RAILROAD JOURNAL.

Saturday, June 8, 1850.

The agency of man in production consists simply in supplying motion to matter. The farmer prepares the ground for seed by moving it, or by adding to it stimulating manures. He casts the seed into the soil, and aids the growth of the plant by moving the earth by which it is surrounded. Harvesting is the removal of the ripened grain to a place of shelter. Man's agency is similar in kind till the grain is prepared for food. The best he can do in the various stages of its growth, is to place it in a position and under circumstances where natural agents shall do their appropriate work.

The same is true of manufacturing. Take cotton for instance. The manufacturer communicates motion to the raw material, which after going through various processes, or in other words after it has been subjected to the action of various natural laws, it comes out in the shape of cloth, rude or perfect, just in proportion as the action of these natural laws have been allowed to exert full or only a partial influence. Man, in all, is but the servant of nature, and his reward is just in proportion to the faithfulness of his services. Our progress as a race, in the physical sciences, is exactly measured by the ease with which we communicate motion to matter; or, in other words, by the extent to which we make use of the forces in nature in our employments and pursuits. In the infancy of the race the power that man used resided in his own muscles and those of beasts of burden. As he gains in experience, he calls to his aid the forces which he finds in the wind and the water fall. Each step in his progress is marked by the discovery and application of some new force which he subjects to his own good. Each successive generation goes on in an accelerated ratio, as each possesses the accumulated experience of all preceding.

The progress of the present, measured by the above standard has vastly exceeded all former epochs in our history, in the discoveries and application of the laws of steam and electricity; while with the aid of these two mighty levers we are undoubtedly on the eve of more brilliant discoveries, and a more rapid progress than has ever yet rewarded the toil and industry of the race.

One of the most striking evidences of our growth from childhood to man's estate, is to be found in the different light with which the operations of nature are now viewed, compared with the ideas of a primitive state of society. Mankind then regarded natural laws as hostile, and their manifestations sent to punish and intimidate him. The heaving of volcanic mountains were caused by the throes of imprisoned giants. The lightning was the angry expression of an offended Deity. Man was the sport of the elements, and was filled with terror at any unusual manifestation of natural laws. How changed is he from this infantile state. Instead of being pursued by them, he has turned upon the chase, has seized hold upon the elements, and instead of being any longer their slave he has subjected them to his bondage. The principle in heat that rent the mountain, now carries him with the speed of the wind wherever he will. The lightning, the most awful of divine manifestations, has become the most docile and obedient servant, daily report-

ing to him the aggregate actions of mankind, and leading him into the very acme of natural mysteries. Viewed in this light, how vast the progress of mankind; and how easy to trace the race to its earliest infancy.

We can yet have but a faint idea of the influence of "motion applied to water" in the operations of railroads in the transportation of merchandise and produce for the interior portions of a country to navigable waters. Under the old system of wagoning, the value of produce depended entirely upon the cost of carriage, and beyond a certain extent it was worthless as an article of merchandise. In many parts of the west, with all their navigable waters, this is literally true. The cost of transportation is greater than the value of the article after it reaches a market. The most fertile lands are consequently worthless, or nearly so. A railroad opens every market in the world to every man whose door it passes, and gives him access to them at all times. No matter what his surplus, whether hay, wheat, sugar, iron, cattle or cloth, all can be taken up and cheaply and safely carried to their respective consumers; and as our means of buying are limited by our ability to sell, the producer has, as additional means, all that is saved over the old way of forwarding to a market. The railroad puts all parts of the country on nearly the same footing—gives to all a ready market, and by the freedom which it allows to travelling, gives to every part of it a great equality in respect to local advantages. A man who lives on the line of a railroad is in the world wherever he may be situated. The railroad obviates the evil of great centralisation, while it allows the utmost freedom of intercourse. A man may spend his days in a crowded city and his nights in a secluded forest.

Such are some of the advantages of railroads. In a mere pecuniary point of view they are the most potent agents in the production of wealth ever devised. Morally they are equally potent. They supply our material wants, which is a necessary condition of moral growth. They disarm the hostility of one part of a country to another by promoting an acquaintance, and diffusing a similarity of ideas. They stimulate to the utmost moral and intellectual progress, as they render the aggregate experience of the whole community, to a certain extent, the experience of each individual.

Kentucky.

This State thus far has done but little in the way of railroads, and might perhaps continued to have slept on some time longer, but for the "noise and confusion" that her sister States are making all around her. However, she seems determined to make up for lost time, and is now the busiest of the busy in the work of preparation, in raising and voting money, in forming companies, in surveying lines, etc.

Some of the most important lines in the country must run through Kentucky. The Mobile and Ohio must pass through its western border. The Nashville and Chattanooga will soon be extended to Louisville. The Maysville and Lexington, in connection with the Lexington and Louisville, will, by cutting off the great bend of the Ohio, be an important line for travel going west, and will ultimately be a link of a line of railroad from Louisville to Baltimore. It may be that the idea of the Charleston and Cincinnati railroad is to be realised by the continuation of the East Tennessee and Georgia railroad. Lexington will soon become the focus of a large number of roads, and must soon

become a much more important place than she is at present. There seems no reason to doubt the early construction of the Maysville and Lexington and the Covington and Lexington on the north, and that a road will also be immediately constructed, extending to Danville in the south; which will gradually work its way to the southern part of the State, if not connect itself with the roads of East Tennessee and Virginia. The people on the proposed lines for a road from Nashville to Louisville are actually engaged in laying their respective lines before the public, and are taking the necessary steps preliminary to commencing work. A railroad is also projected from Nashville to Henderson, Kentucky, opposite Evansville, Ia., for connecting with the great Indiana canal, which is soon to be completed to the latter point.

The above are some of the leading railroad projects in Kentucky. There are others of less importance now under consideration. There is a great deal of accumulated wealth in this State.—In natural resources she is hardly inferior to any State in the Union, and there is no reason why she should not commence and construct those avenues of communication so necessary to her great interests, and which all parts of the country are beginning to regard as among the indispensable luxuries and conveniences of life.

Steamboat Paddles.

In this age of locomotion, when the wits of men are taxed to the utmost to secure the greatest speed of steamers and locomotives, it is indeed marvellous that so faulty a construction and arrangement of paddles continues to prevail, and that an improvement upon the modes now in use attracts so little attention. In constructing the Atlantic and Pacific, for instance, Mr. Collins spared no pains nor expense to secure a perfect model for the hull, and the most approved machinery, but adopted apparently without inquiry, the form of the paddle wheel in use. We believe that with a proper arrangement of the paddle his steamers would cross the Atlantic in much less time than is now occupied in the passage, and that they will not realize his expectations till these improvements are made.

It can be very easily demonstrated that to obtain the greatest amount of power, only one paddle on each wheel shall be submerged at the same time. This will be readily understood from the fact that by the addition of a certain number of paddles, the whole may be converted into a solid cylinder. This cylinder displaces all the water within its reach, and leaves it none to act upon. The less the amt. of water displaced, the greater is the action of floats or paddles. Theoretically, therefore, they should be made as thin as possible, with the requisite strength, and should be so far apart as to displace the least possible amount of water, that is only one on each wheel should be in the water at once.

This is one objection to the use of a great number of paddles. There are others of an almost equally serious character. It is well understood that after the float has passed its vertical position and begins to rise, its movement retards, instead of propelling the vessel, on account of lifting the water, as it is termed. The rapid motion of the wheel does not allow time for the water to escape from the floats, but an immense volume of it is lifted up from the surface, and a portion of it is carried entirely over the wheels. Each float takes its load. Where there are ten floats submerged, the resistance from this source is ten times greater than

where only one float occupies the space of the ten.

The Atlantic ~~has~~, we believe, ten floats on each wheel submerged when she left this port. Her loss of speed from this cause alone can be very easily determined by ascertaining how much more water ten floats displaced and raised than one would have done. This may be made the subject of a mathematical calculation, the results of which cannot be disputed. We will admit there may be reason for not following implicitly the deduction from abstract premises, but we are satisfied that these abstract conditions may be complied with to a much greater extent than we find them to be in practice.

Pacific Railroad--Mr. Whitney's "Plan."

We had supposed that the decided hostility which Congress has recently expressed towards Mr. Whitney's Pacific railroad scheme, had given it its final quietus. Not so. We find that Mr. Whitney, nothing daunted by his defeat, is as active as ever; and that he has not yet even exhausted the whole dupility of the country. He has succeeded in imposing upon the credulity of a few weak members of Congress who compose the majority of the committee on canals and roads, of which Hon. J. D. Robinson, of Indiana, is chairman, who in their official capacity have revamped the old story, and have again presented it to the world in an entirely new dress. The great farce however is about played out, and it is only prolonged by the energy and activity of its author. Congress has a decided antipathy for it, and it is not supported by a single name in the country, which should be authority in such matters. If Mr. Whitney chooses to amuse himself with it we have no objections.—With such harmless amusements we do not wish to interfere.

The Railroad Interest.

There has been this year a decided improvement in the earnings of railroad companies over the last, and as a necessary consequence, an advance in price in this species of property. In all the roads running from this city the advance has been very great, and is based upon the large and constantly increasing receipts. From the abundance of capital in this city seeking investment, any real improvement in railroad property is sure to be seen in the increased price it commands.

The earnings of the Massachusetts roads show a decided increase over last year, notwithstanding the general depression of business in that State.—The prices of stocks gain but slowly, owing to the scarcity of money there. Massachusetts has over invested, and has hardly ready means enough to carry on her ordinary business transactions. Unfortunately all her leading interests are exceedingly depressed, and at the present time she can accomplish little to extricate herself from her embarrassments. An improvement however is constantly going on, and a favorable "turn of times" would soon restore her former prosperity.

All other parts of the country also show a great improvement. Railroads are beginning to recover the position which they once possessed in public estimation, and to be regarded as useful in themselves, and as offering a safe and profitable investment for money. The depression which this kind of property has suffered, has had the good effect to correct much unwise and unprovident management, and will be productive of great good in the end.

The increased confidence in railroads is very favorable to those coming into the market for money

to complete new works, and will enable such to negotiate their securities at a better rate than could be done a year since.

Missouri.

The Pacific Railway.

We are informed that the surveys of the Pacific railway commenced on the 24th of May, taking the city Directrix as the base of reference.

The Chief Engineer, we learn, is now on his way to Jefferson city, making his first general reconnaissance.

We are pleased to see this good work so promptly begun. We trust that our citizens will consider this as an auspicious time to give to the company their aid, and that those who have subscribed will go forward promptly and pay up the very small instalment that has been called for.

This great work will be like another Mississippi flowing into St. Louis and through our State. It will give new life and activity to all branches of business, and open a new career of prosperity to the vast interior.

We trust, also, that Congress, seeing the earnestness with which this enterprise is to be carried out by the people of this city and State, will at once grant the right of way as well as a liberal quantity of the public lands.—*St. Louis Int.*

Mineral and Agricultural Lands.

From the Lake Superior Journal, published at the Sault Ste Marie, we learn that up to December last, there had been sold in the Lake Superior district, and 14,702 acres of mineral land and 17,606 acres of agricultural land.

Throughout the Lake Superior region are large sections of good farming land, and capable of sustaining as large a population as that of New Hampshire, Vermont, or Maine. The mining interest has heretofore diverted the attention of the emigrant to this region, from the agricultural capacity and advantages of the country.

Albany and Rutland Railroad.

The friends of the work are making rapid progress in procuring the necessary means for its construction, and there can be no doubt of their success in this, the most important part of railroad making. The above is a work of much importance, both in its local and general influences, running through a very fine section of the country, and connecting the Vermont railroad and Albany, and the railroad system of this State.

The proposed road is to run through the towns of Danby, Dorset, and Bennington, Vermont; and thence by Cahoes to Albany. The whole length of line is 86 miles, made up as follows: from Rutland to Bennington 51 miles, and from Bennington to Albany 35 miles. The route is reported to be favorable, and we may count that Albany and Rutland will soon be added to the list of finished railroads in this State and Vermont.

Pennsylvania.

Reading Railroad.—The receipts of the Reading railroad for May have been very large, and should the earnings continue as favorable the company will be enabled to declare a good dividend on the old stock. The receipts for May have been as follows:

Passengers.....	\$14,862 11
Freight on merchandise.....	8,949 22
Freight on coal.....	170,809 03
Mail.....	783 39
Miscellaneous.....	490 81
	\$195,894 56

The amount of coal shipped is 111,899 tons.

Tennessee.

Another "Port of Entry."—A few days ago, the steamer "Cassandra" with a load of salt, run up the "Little Tennessee river," to Morganton, about 70 miles above the mouth, and brought out a load of bacon, etc. The people were delighted with this pioneer trip on their beautiful little river, and declared that they would build a light draught boat to do their trade. The great outlet for produce afforded by the railroad to Chattanooga, is waking up the people on every stream tributary to the Tennessee river, and it is not unreasonable to suppose that in a few years steamboats will be successfully navigating the Elk, Little Tennessee, Clinch, Chucky, etc., and the vast productions of the countries contiguous to those rivers, will find their way to market over the Georgia road.—*Chattanooga Gazette.*

Georgia Railroad.

The operations of this road for the past year will be seen from the following abstract from the report submitted by the superintendent of transportation, F. C. Arms, Esq.

TABLE—Exhibiting the comparative receipts and business of the road for the years ending March 31st, 1849 and 1850.

	Year ending Mar. 31, '49.	Year ending Mar. 31, '50.	Increase.
<i>Receipts.</i>			
Passengers...	\$166,484 04	\$189,650 45	\$23,166 41
Freight.....	376,957 07	398,006 92	21,049 85
U. S. Mail & rents.....	38,573 46	39,149 65	576 17
Totals.....	\$582,014 59	\$626,807 02	\$44,792 43
<i>Expenses.</i>			
Conducting transportation..	\$49,895 90	\$59,155 00	\$10,259 10
Motive power.....	65,531 14	81,111 89	15,580 75
Maintenance of way.....	66,054 99	70,717 82	3,662 83
Maintenance of cars.....	14,300 85	17,297 26	2,996 41
Total.....	\$195,782 88	\$228,281 97	\$32,499 09
Net profits...	\$386,231 71	\$398,525 05	\$12,293 34

The increased income, Mr. Arms remarks, has been, from passengers \$23,166 41; from freight \$21,049 85, and from mail transportation and rents \$576 17. Sixty-five thousand four hundred and thirty-eight passengers have been carried in the cars of the regular trains, making an average of 179 per day, both ways—against 106 for each of the two preceding years. The average number of through passengers per day, between Charleston and Montgomery, has been 17 for the last year, and 16 for the previous year. This average for through passengers between Charleston and all points in Alabama (including Montgomery) has been for the last two years 21 and 18—showing an increase 17 per cent.

The number of local passengers (exclusive of emigrants and those by extra trips) has increased from 31,517, (86 per day) to 57,061 (156 per day)—and the receipts thereby from \$104,653 to 132,696. A portion of this increased passenger business is unquestionably attributable to the low rates of fare, which were reduced to three cents per mile on the 15th of June, 1849.

A very satisfactory increase will also be noticed in the up freights, viz: from \$148,981 to 210,757, (35 per cent.) The falling off in the down freights has been caused by the short crop of cotton, and entire failure of the wheat crop—the diminution of receipts from these causes being 23,692 bales of cotton, 13,361 barrels of flour, and 100,431 bushels of grain.

Another Lake Steamer.

We learn that the Michigan Central railroad company have added another new steamer, called the *Ocean*, to their line, which now consists of that boat, the *Mayflower* and the *Atlantic*. The hull of the *Ocean* was built at Newport, on the Detroit river, and the decoration and furnishing were completed at Detroit. The cost of the boat is about \$120,000. Her length on deck is 265 feet; breadth of beam 33½ feet; depth of hold 13 feet. She has 80 state rooms, and accommodations for 400 cabin and about the same number of steerage passengers. She is propelled by a powerful steam engine, from the works of Secor & Co., New York, having the following dimensions: diameter of cylinder 61 in., length of stroke 11 feet, diameter of wheels 32 feet, length of bucket 10½ feet; two large boilers 11 feet wide; length of boilers 30 feet.

Wabash and Erie Canal.

Yesterday we saw letters from Mr. Charles Butler, president of the board of trustees, at New York, and Mr. Thos. Downing, the lately appointed trustee, residing at Terre Haute, to a gentleman in this city, which contained some items of interest relative to the Wabash and Erie canal. It was stated in these letters that the plan for completing the unfinished portion of this canal would be determined upon at the next meeting of the board, which will be in June, and the work would be immediately commenced and industriously prosecuted to its completion. The canal is now in operation to Point Commerce, while contracts are now in existence and the work progressing, to complete the improvement to Maysville. From Evansville, the canal has been dug twenty-one miles. From this point to Maysville is about thirty-five miles, thus leaving that distance to be put under contract at the next sitting of the board.—*Evansville Jour.*

New York and Erie Road.

The earnings of the Erie railroad in May have somewhat exceeded the expectations of the managers, and fully sustained the promise of the early part of the month. It must be remembered that at least twenty days of this month have been very rainy, and that this continuation of wet weather has made the common roads in the interior almost impassible. Under these circumstances, when travelling to the road is difficult, and moving freight still more so, the result of the month's traffic is highly gratifying. The receipts were as follows:

From passengers and mail.....	\$74,262 01
From freight.....	73,964 54
Total.....	\$148,226 55
The receipts for May, 1849, were.....	66,066 67

Increase..... \$82,159 88

The aggregate receipts of the five months of this year have been as annexed:

EARNINGS OF ERIE RAILROAD, 1850.

	Pass. & mail.	Freight.	Total.
January.....	46,752	66,222	112,974
February.....	46,471	55,741	102,212
March.....	55,349	75,229	130,578
April.....	69,229	72,756	141,935
May.....	74,262	73,964	148,226

Aggregate receipts.....\$635,925

Another Mammoth Cave.

A "hole in the ground" has been discovered and explored, near Madison, the Capital of Wisconsin, which bids fair to rival the great subterranean excavation in Kentucky.

The party who explored the Wisconsin cave

were five days "under ground," coming out several miles distant from the place where they "went in." The vastness of the cavern, at various places, is described as *impressive*, and is supposed to extend under most of the counties of Dane and Iowa. The party passed over and among large masses and blocks, which, on examination, proved to be *lead ore of fine quality*, spreading over a surface of *three miles*—not less than 200,000 tons in sight!—They found fine copper ore, and *eleven pounds of native silver*. Crystals, stalactites, incrustations, etc., abundant, and water falls and a lake, which was explored in a canoe, and found to be 37 feet deep. Such is the statement of the subterranean explorers, published in the Madison Argus, by Howell Lumley, Esq., the leader of the party.

New Scientific Discovery.

The Paris correspondent of the London Times says:

"The scientific world has been in a state of commotion during the whole week, in consequence of the publication of the discovery of the long-sought for secret of the fusion and crystallization of carbon. The Sorbonne has been crowded for the last few days to behold the result of this discovery, in the shape of a tolerably-sized diamond of great lustre, which M. Desprez, the happy discoverer, submits to the examination of every chemist or *savant* who chooses to visit him." He declares that, so long ago as last autumn, he had succeeded in producing the diamond, but in such minute particles as to be visible only through the microscope, and, fearful of raising irony and suspicion, he had kept the secret, until, by dint of repeated experiments and great labor, he had completed the one he now offers to public view. Four solar lens of immense power, aided by the tremendous galvanic pile of the Sorbonne, have been the means of producing the result now before us. M. Desprez holds himself ready to display the experiment whenever it may be required. The diamond produced is of the quality known in the east as the black diamond, one single specimen of which was sold by Prince Rostoff to the late Duke of York for the enormous sum of twelve thousand pounds!"

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DEALERS IN IRON AND IRON
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AGENTS for the Balt. City Rolling Mill, from which establishment they are prepared to furnish Eliott's round, square, and flat bar iron, puddled and charcoal boiler plates and billet iron—also agents for the sale of the Laurel and Maryland (Balt.) charcoal forge pig irons, Balt. hard iron for chilling wheels, anti-rust nails, Cast-iron foundry iron, boiler blooms from the Caledonian works, Wm. Jessop & Son's cast steel, Coleman's blister steel and nail rods, hoop, band, sheet, oval and common English iron.

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A young man of experience in Surveying wishes a situation on a Railroad as an Assistant. Please apply at this office.

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THESE Works are in full operation in Manufacturing to order, Locomotive Steam Engines & Tenders, of the best principle and construction of material, using wrought iron heavy frames with pedestals welded thereto, and all parts of the engine made of the best wrought iron, except cylinders, pumps and boxes—obtaining greater durability, and carrying less weight over the road, than engines constructed of cast iron.

Wrought Iron Tires made any required size, and Tire Bars bent and welded with dispatch. Chilled Wheels for Cars, Trucks and Tenders, made from the toughest iron.

Driving and Tender and Car Wheels fitted to Axles with Brass Boxes and Springs, and Railroad Machinery generally. Manufactured and for sale by April 11, 1849. E. S. NORRIS.

Theodolite for Sale.

A FIRST RATE 5 INCH THEODOLITE for sale at a bargain. Enquire at the Railroad Journal Office. 2w37

Election of an Engineer.

At a Meeting of the Board of Directors of the Virginia Central Railroad Co. at Charlottesville on the 4th day of June, 1850,

Resolved, That the election of a Chief Engineer in the place of Wm. A. Kuper, whose resignation has been accepted, is postponed to take place in Richmond on Tuesday the 18th of June instant.

A copy from the minutes.

JOHN GARRET, Secretary.

**Lovegrove's Patent Cast Iron
Water and Gas Pipes.**

THE Subscriber, the Inventor and Patentee of the Centrifugal mode of giving form to metallic substances while in a molten state, is preparing to make Cast Iron Water and Gas Pipes, of any dimensions, at prices much lower than they can be made in the old manner, and the pipes warranted to stand a pressure of three hundred pounds to the square inch, and to be soft enough to drill. Steam Engines and all kinds of machinery. Cast Iron Doors and Frames, and Mill Castings of every description, made to order.

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CONTAINING Correct Tables, showing the time for starting of trains from all stations, distances, fares, etc., on all the Railway lines in the U. States; also many of the principal Steamboat and Stage routes—accompanied by a complete RAILWAY MAP. Price, single copies 12½ cts., or \$1 per annum. Published on the first of every month, corrected from returns furnished by the Railway Superintendents throughout the Union.

This book has been compiled somewhat on the plan of Bradshaw's Guide, with such improvements in size, form and arrangement as have seemed desirable; and the publisher confidently hopes it will not be found liable to the objections of incompleteness and incorrectness, which have been made, and justly too, against various other similar works heretofore issued.

The subscriber having had the management of the NEW YORK PATHFINDER almost from its commencement, has enjoyed superior facilities in obtaining information relating to the thoroughfares of travel, and is therefore well qualified to prosecute with success the arduous undertaking of furnishing a complete and correct national guide book.

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CURRAN DINSMORE, Publisher.

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New York, May 21, 1849.

To Railroad Companies.

FOR SALE—A Second-hand Locomotive Engine and Tender, of about 10 tons weight, in good order, and warranted to perform well. Any company wanting a cheap engine for a passenger or light burden train, will rarely meet with an opportunity so favorable as the present. The engine and tender are in perfect running order, and will be tested to the satisfaction of any one wishing to purchase. Price \$1,500.

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Frazer P.O., Chester county, Pa. P.S.—The Engine can be seen by calling on H. Osmond & Co., Car-builders, Broad st., Philadelphia.

September 6, 1849.

Spikes, Spikes, Spikes.

ANY person wishing a simple and effective Spike Machine, or a number of them, may be supplied by addressing J. W. FLACK, Troy, N. Y. March 6, 1850.

Great American Engineering

AND MECHANICAL WORK, just published in a medium folio, 75 cts. to Subscribers, One Dollar to non-subscribers.

Part V of "Specimens of the Stone, Iron and Timber Bridges, Viaducts, Tunnels, &c. &c. of the United States Railroads." By George Duggan, Architect and Civil Engineer.

The present part contains beautifully executed plans, elevations and sections of the Timber Viaduct across the Canewata Creek at Lanesboro', Pa., and the Details of the Starucca, (stone) Viaduct near Lanesboro', Pa., on the line of the N. Y. & Erie R. R.

N.B.—This work is published by subscription of the most eminent in the engineering profession of the U. States, and will be completed in 12 parts, at 75 cents each to those who remit their names and subscriptions before the 1st June next—when the first 6 parts or one half of the work will be published—after which the price will be raised to \$1 per part.

To those making a present remittance of \$5, and the remainder \$4, when they have been supplied with the first six parts, the work will be forwarded regularly as published. Parties remitting \$9 shall receive it monthly post-free in any part of the United States.

"It is a work that was a great desideratum, and must prove of great benefit to the engineering profession generally, and especially to the tyro in practical engineering and mechanical knowledge; in truth it strikes us, that it would require years of labor and patient toil on the part of a young engineer to prepare the drawings, and collect the information that will be embodied in this work, and can now be secured for the trifling sum of \$9."—*Scientific Amer.* March 16, 1850.

In connection with this subject (Iron Railroad Structures) we take occasion to call attention again to Mr. Duggan's valuable and expensive publication, exhibiting drawings, with full descriptions of the various stone, iron and wooden bridges, viaducts, tunnels, culverts, etc., of all the Railroads in the United States. Mr. Duggan is an accomplished Architect and Civil Engineer, who came from Ireland to this country to exercise his profession; but finding railroad construction here, in many respects, different from that he had been accustomed to in Europe, he applied himself to the study of our system; and the fruits of his researches and investigations embodied in this work, are well calculated to meet the exigencies of engineers, and to assist draughtsmen, bridge builders, mechanics and students.—[N. Y. Journal of Commerce, Feb. 14, 1850.]

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April 22, 1849. 1v*17

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WE the undersigned are now manufacturing an oil intended for the use of Railroads, Steamers and Manufacturing establishments. It has been in use several months and has given very general satisfaction. Our price is uniformly 70 cts. per gallon. Enquiries or orders attended to promptly. Address

ROBBINS, LANGDON & CO.,
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CERTIFICATES.

Providence, March 22d, 1850.

Messrs. Robbins, Langdon & Co.,

Gentlemen: We have given your machine oil a thorough trial, and find that it possesses all the qualities that we could wish as it works better than any sperm oil we have ever used. Our shafts that required oiling four times a day with the best sperm oil that we could get, work equally as well by the application of your oil twice a day, and your oil stands cold weather much better than any oil we have ever used. Our engineer having had years' experience in running and making engines, we put great confidence in his judgment, and he gives it as his opinion that your oil is fully equal to if not better than any he ever used; and we shall soon give you an order for more, as we do not want any other kind of oil as long as we can get yours.

Very respectfully yours,

JACKSON, CLARK & CO.

Bridgeport, Nov. 7th, 1849.

Messrs. Robbins, Langdon & Co.,

Gentlemen: After about three months' trial of your oil, I have come to the conclusion to use it entirely on the engines on the New York and New Haven and the New Haven and Northampton Railroads for the following reasons:

1. It wears quite as long as sperm oil.
2. So far as I have tried it, it keeps the Journals equally cool as sperm oil.
3. I have no complaint from our men about cleaning the engines, and presume it is equally as easy to clean an engine by using your oil as it is in using sperm oil.
4. I can see no reason why it is not equal to the best of sperm oil for lubricating machinery.
5. There is in my opinion a very great saving to all parties in using your oil for lubricating machinery.
6. I believe it will stand cold weather better than any sperm oil. Very respectfully yours,

R. B. MASON, Supt. N.Y. & N.H. Railway.

Steamer Bay State, Oct. 22d, 1849.

Messrs. Robbins, Langdon & Co.,

Gentlemen: In answer to your request for my testimony as to the machinery oil manufactured by you, I will say that I have used it for some time past on the Bay State, and am perfectly satisfied that your statement to me of its good qualities, is correct. As far as its lasting properties go, it wears equally long as sperm oil, runs perfectly free, and has no appearance of thickening. As seeing is better than hearing, I would recommend you to send your friends on board your boat, and they can then, by ocular demonstration, judge for themselves. Yours respectfully, **JOHN GRAY**,
Engineer of Steamer Bay State, Pier 3, N.R.

Steamboat Knickerbocker, Sept. 22, 1849.

Gentlemen: Mr. Hall, Agent of the Norwich and New London Steamboat Co., placed in my hands some of your machinery oil, which he desired me to use on the engine and other machinery, which I have done, and was so much pleased with the working, that I recommended the owners to give you their orders.

I have been using the article since August 19, and with perfect satisfaction, and I am well satisfied that your oil is as good as the best of sperm for lubricating machinery. I am yours very respectfully,

SAMUEL CARTER,

Engineer of Steamboat Knickerbocker, Pier 18, N.R.
To Messrs. Robbins, Langdon & Co.,
Oil Merchants, 133 Water street, New York.

Steamboat Worcester, N. York, Oct. 15, 1849.

Messrs. Robbins, Langdon & Co.,

Gentlemen: I beg to acknowledge the receipt of your letter requesting my opinion as to your oil for machinery, which I had not time to reply to previous to my return to Norwich. I have been using your oil on the engine and machinery of the Worcester with perfect success, and have much pleasure in testifying as to its good qualities. In my opinion, the journals keep cooler with your oil than with sperm, and it wears equally well. Should you at any time wish to refer to me as to your oil, I beg you will do so without hesitation. Yours respectfully, **JAS. CROOKER**,
Engineer Steamboat Worcester, Pier 18, N.R.

New York, August 3d, 1849.

Messrs. Robbins, Langdon & Co.,

Gentlemen: I received your letter in regard to your oil for machinery, which I handed to our engineer, and have much pleasure in sending you an extract from his letter to me on the subject: "I have applied the oil sent me upon our hot journals and cylinders, and find that they keep cooler with it than with sperm oil. I cannot find any fault with the oil, although I have watched it carefully. I have also tried it against an equal quantity of sperm oil, and find it wears quite as well." You are quite at liberty to show this extract to your friends, and shall be happy to give any further certificate you may require. **WM. RIDER**,
Treasurer Union India-rubber Co., 19 Nassau st. N.Y.

New York, March 22d, 1850.

Messrs. Robbins, Langdon & Co.,

Gentlemen: I have been using your machinery oil on the engine and other machinery of the Steamer Southerner running from this to Charleston, and find it equal to sperm oil. I shall continue the use of the same, and you are at liberty to refer to me at any time. Yours respectfully, **DAVID N. MAXON**,
Chief Engineer Steamer Southerner.

Steamboat C. Vanderbilt, N. York, Oct. 11, 1849.

Messrs. Robbins, Langdon & Co.,

Gentlemen: In reply to your inquiries respecting the qualities of your machinery oil, I am happy to inform you that I have been using the article sent me for some time past, not only on the engine but on all other machinery connected with it: and from a careful and close examination, I am well satisfied that your oil is as good as the best of sperm oil for lubricating machinery. I have recommended Mr. Lockwood the agent of the company, to give you their orders.

Yours respectfully, **JAMES BAKER**,
Engineer Steamboat C. Vanderbilt, Pier 3, N.R.

Brooklyn, August 29, 1849.

Messrs. Robbins, Langdon & Co.,

Gentlemen: Your letter of the 29th was received, and I am happy to inform you that I have used your machinery oil throughout my establishment, and I am still of the opinion that it is as good as the best of sperm oil for lubricating machinery. I should be pleased at any time to have your friends witness the working, and I am sure, after once doing so, will give you their orders. Please send me another cask by the evening of the 3d, and by so doing you will much oblige,
W. M. BURDON, Manufacturer of
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Bancks, C. W.,

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Berrien, John M.,

Michigan Central Railroad, Marshall, Mich.

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Clement, Wm. H.,

Little Miami Railroad, Cincinnati, Ohio.

Cozzens, W. H.,

Engineer and Surveyor, St. Louis, Mo.

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Davidson, M. O.,

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Fisk, Charles B.,

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Fitchburgh Railroad, Boston, Mass.

Floyd-Jones, Charles,

South Oyster Bay, L. I.

Gzowski, Mr.,

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Grant, James H.,

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Holcomb, F. P.,

Southwestern Railroad, Macon, Ga.

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Sanford, C. O.,

South Side Railroad, Virginia.

Schlatter, Charles L.,

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Sours, Peter,

Rahway, New Jersey.

Stark, George.,

Bost., Con. and Mont. R. R., Meredith Bridge, N. H.

Steele, J. Dutton,

Pottstown, Pa.

Trimble, Isaac R.,

Philad., Wil. & Baltimore Railroad, Wilmington, Del.

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United States Fort, Bucksport, Me.

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John Barstow, Esq., Providence.

Lewis Bullard, Esq., Boston.

February 9, 1850.

6m*

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S. C. HILLS, No. 43 Fulton street, New York, has
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S. C. H.'s arrangements with several machine shops
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November 23, 1849.

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For Inclined Planes, Suspension Bridges, Standing
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TRENTON, N. J.

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179 BROADWAY, NEW YORK.
SCHOOL OF CHEMISTRY.

IRON.

Railroad Iron.
3,000 TONS C. L. MAKE 63½ lbs. per yard,
now landing and to arrive.
Also contracts made for future delivery of above su-
perior make English Iron.
300 Tons Banks Best Iron, Round, Square and Flat.
200 " English Bar " "
10 " 9-16 Square Iron for Railroad Spikes.
For sale in lots to suit purchasers by
DAVID W. WETMORE.
New York, March 26, 1850. 3m

**SPRING STEEL FOR LOCOMOTIVES, TEN-
DERS AND CARS.**—The subscriber is engaged
in manufacturing spring steel from 1½ to 6 inches in
width, and of any thickness required: large quantities
are yearly furnished for railroad purposes, and wher-
ever used its quality has been approved of. The estab-
lishment being large, can execute orders with great
promptitude, at reasonable prices, and the quality war-
ranted. Address **J. F. WINSLOW, Agent,**
Albany Iron and Nail Works.

Railroad Iron.
THE Undersigned, Agents for Manufacturers, are
prepared to contract to deliver Rails of superior
quality, and of any size or pattern, to any ports of dis-
charge in the United States.
COLLINS, VOSE & CO.,
74 South St.
New York, June 1, 1850.

Railroad Iron.
1,500 Tons weighing 58 lbs. per lineal yard.
500 " " 57 " "
500 " " 56 " "
500 " " 60 & 61 lbs. "
Also 2½x½ flat rails. All the above being of approv-
ed patterns. For sale by
DAVIS, BROOKS, & CO.,
68 Broad street.

N.B.—Rails imported on commission, or at a fixed
price.

Iron.
Pig Iron, Anthracite and Charcoal; Boiler and Flue
Iron, Spring and Blistered Steel, Nail Rods, Best Re-
fined Bar Iron, Railroad Iron, Car Axles, Nails, Stove
Castings, Cast Iron Pipes of all sizes, Railway Chairs
of approved patterns for sale by
COLEMAN, KELTON & CAMPBELL,
109 N. Water St., Philadelphia.

IRONDALE PIG METAL, MANUFACTURED
and for sale by the Bloomsburg Railroad Iron Co.
LINDLEY FISHER, Treasurer.
75 N. Water St., Philadelphia.

Railroad Iron.
2000 Tons, weighing 58 pounds per lineal yard,
of the most approved pattern of T rails, in
store and to arrive, for sale by
COLLINS, VOSE & CO.,
74 South St.
New York, June 1, 1850.

Railroad Iron.
1675 Tons, weighing about 61 lbs. per yard, 90
tons, weighing about 52 lbs. per yard, and
825 tons, weighing about 53½ lbs. per yard, of the lat-
est and most approved patterns of T rail, for sale by
BOORMAN, JOHNSTON & CO.,
119 Greenwich street.
New York, Feb. 25, 1850.

N.B.—B., J. & Co are also prepared to take con-
tracts for English rails, delivered in any of the Atlan-
tic ports of the United States.

Railroad Iron.
THE UNDERSIGNED, HAVING made arrange-
ments abroad, are prepared to contract for the de-
livery of Foreign rails, of approved brands upon the
most favorable terms.
They will also make contracts for American rails,
made at their Trenton works, from Andover Iron, in
whole or in part, as may be agreed upon.
They are prepared to furnish Telegraph, Spring and
Market Wire; Braziers and Wire Rods; Rivets and
Merchant Bars to order, all made exclusively from An-
dover Iron. The attention of parties who require iron
of the very best quality for special purposes, is respect-
fully invited.
COOPER & HEWITT,
17 Burling Slip, New York.

February 15, 1850.

Glendon Refined Iron.

Round Iron, Band Iron, Hoop Iron,
Square " Flat " Scroll "
Axles, Locomotive Tyres,
Manufactured at the Glendon Mills, East Boston, for
sale by **GEORGE GARDNER & CO.,**
5 Liberty Square, Boston, Mass.
Sept. 15, 1849. 3m37

**PATENT HAMMERED RAILROAD, SHIP &
BOAT SPIKES.**—The Albany Iron Works
have always on hand, of their own manufacture, a
large assortment of Railroad, Ship and Boat Spikes
from 2 to 12 inches in length, and of any form of head.
From the excellence of the material always used in
their manufacture, and their very general use for rail-
roads and other purposes in this country, the manu-
facturers have no hesitation in warranting them fully
equal to the best spikes in market, both as to quality
and appearance. All orders addressed to the subscrib-
ers at the works will be promptly executed.

JOHN F. WINSLOW, Agent.
Albany Iron and Nail Works, Troy, N. Y.
The above Spikes may be had at factory prices, of
Erastus Corning & Co Albany; Menitt & Co., New
York; E. Pratt & Br 1st, Esplanade, Md

**LAP—WELDED
WROUGHT IRON TUBES**

FOR
TUBULAR BOILERS,
FROM ONE AND A QUARTER TO SEVEN
INCHES IN DIAMETER.

THE ONLY Tubes of the same quality and man-
ufacture as those so extensively used in England,
Scotland, France and Germany, for Locomotive, Ma-
rine and other Steam Engine Boilers.
THOMAS PROSSER & SON, Patentees,
28 Platt street, New York.

Railroad Iron.

THE UNDERSIGNED ARE PREPARED TO
contract for the delivery of English Railroad Iron
of favorite brands, during the Spring. They also re-
ceive orders for the importation of Pig, Bar, Sheet, etc.
Iron.
THOMAS B. SANDS & CO.,
22 South William street,
New York.
February 3, 1849.

Iron Store.

THE Subscribers, having the selling agency of the
following named Rolling Mills, viz: Norristown,
Rough and Ready, Kensington, Triadelphia, Potts-
grove and Thorndale, can supply Railroad Companies,
Merchants and others, at the wholesale mill prices for
bars of all sizes, sheets cut to order as large as 58 in.
diameter; Railroad Iron, domestic and foreign; Loco-
motive tire welded to given size; Chairs and Spikes;
Iron for shafting, locomotive and general machinery
purposes; Cast, Shear, Blister and Spring Steel; Boil-
er rivets; Copper; Pig iron, etc., etc.
MORRIS, JONES & CO.,
Iron Merchants,
Schuylkill 7th and Market Sts., Philadelphia.
August 16, 1849. ly33

Railroad Iron.

THE MOUNT SAVAGE IRON WORKS, AL-
legany county, Maryland, having recently pass-
ed into the hands of new proprietors, are now prepar-
ed, with increased facilities, to execute orders for any
of the various patterns of Railroad Iron. Communi-
cations addressed to either of the subscribers will have
prompt attention. **J. F. WINSLOW, President**
Troy, N. Y.

ERASTUS CORNING, Albany!
WARREN DELANO, Jr., N. Y.
JOHN M. FORBES, Boston.
ENOCH PRATT, Baltimore, Md.

November 6, 1848.

Railroad Iron.

THE SUBSCRIBERS ARE PREPARED TO
take orders for Railroad Iron to be made at their
Phoenix Iron Works, situated on the Schuylkill River,
near this city, and at their Safe Harbor Iron Works,
situated in Lancaster County, on the Susquehanna
river; which two establishments are now turning out
upwards of 1800 tons of finished rails per month.
Companies desirous of contracting will be promptly
supplied with rails of any required pattern, and of the
very best quality.

REEVES, BUCK & CO.
45 North Water St. Philadelphia.
March 15, 1849.

Monument Foundry.

A. & W. DENMEAD & SON,
Corner of North and Monument Sts.,—Baltimore,
HAVING THEIR

IRON FOUNDRY AND MACHINE SHOP

In complete operation, are prepared to execute faithfully and promptly, orders for Locomotive or Stationary Steam Engines, Woolen, Cotton, Flour, Rice, Sugar Grist, or Saw Mills, Slide, Hand or Chuck Lathes, Machinery for cutting all kinds of Gearing Hydraulic, Tobacco and other Presses, Car and Locomotive patent Ring Wheels, warranted, Bridge and Mill Castings of every description, Gas and Water Pipes of all sizes, warranted, Railroad Wheels with best fagotted axle, furnished and fitted up for use, complete. Being provided with Heavy Lathes for Boring and Turning Screws, Cylinders, etc., we can furnish them of any pitch, length or pattern.

Old Machinery Renewed or Repaired—Estimates for Work in any part of the United States furnished at short notice.

June 8, 1849.

Iron Wire.

REFINED IRON WIRE OF ALL KINDS, Card, Reed, Cotton-flyer, Annealed, Broom, Buckle, and Spring Wire. Also all kinds of Round, Flat or Oval Wire, best adapted to various machine purposes, annealed and tempered, straightened and cut any length, manufactured and sold by

ICHABOD WASHBURN.

Worcester, Mass., May 25, 1849.

American and Foreign Iron.**FOR SALE,**

300 Tons A 1, Iron Dale Foundry Iron.
100 " 1, " " "
100 " 2, " " "
100 " " Forge " "
400 " Wilkesbarre " "
100 " "Roaring Run" Foundry Iron.
300 " Fort " "
50 " Catocin " "
25c " Chikiswalungo " "
5c " "Columbia" "chilling" iron, a very superior article for car wheels.
75 " "Columbia" refined boiler blooms.
30 " 1 x 1/2 Slit iron.
50 " Best Penna. boiler iron.
50 " "Puddled" "
50 " Bagnall & Sons refined bar iron.
50 " Common bar iron.

Locomotive and other boiler iron furnished to order.

GOODHUE & CO.,

New York.

64 South street

American Pig, Bloom and Boiler Iron.

HENRY THOMPSON & SON,
No 57 South Gay St., Baltimore, Md.,
Offer for sale *Hot Blast Charcoal Pig Iron* made at the *Catoctin* (Maryland), and *Taylor* (Virginia), Furnaces; *Cold Blast* Charcoal Pig Iron from the *Cloverdale* and *Calamba*, Va., Furnaces, suitable for *Wheels* or *Machinery* requiring *extra strength*; also *Boiler and Flue Iron* from the mills of *Edge & Hiles* in Delaware, and *best quality Boiler Blooms* made from *Cold Blast Pig Iron* at the *Shenandoah Works*, Va. The productions of the above establishments can always be had at the lowest market price, for approved paper. *American Pig Iron* of other brands, and *Rolled and Hammered Bar Iron* furnished at lowest prices. Agents for *Watson's Perth Amboy Fire Bricks*, and *Rich & Cos. New York Salamander Iron Chests*.
Baltimore, June 14, 1849. 6 mos

Wheel, Forge and Foundry Iron.

LOCUST GROVE Wheel Iron of great strength and superior chilling property.
Balt. Charcoal Forge Iron, from Patuxent, Curtis Creek and Gunpowder furnaces.

Elkridge Foundry Iron, of superior strength and softness. Anthracite and Charcoal Iron from Pennsylvania and Virginia. Gas and Water Pipes, Lamp Posts from Elkridge furnace.

LEMMON & GLENN,

6m9

62 Buchanan's Wharf, Baltimore.

Iron.

THE SUBSCRIBERS having resumed the agency of the New-Jersey Iron Company, are prepared to execute orders for the different kinds and sizes of Iron usually made at the works of the company, and offer for sale on advantageous terms,—

150 tons No. 1 Boonton Foundry Pig Iron.

100 " No. 2 do. do. do.

300 " Nos. 2 & 3 Forge do. do.

100 " No. 2 Glendon do. do.

140 " Nos. 2 & 3 Lehigh Crane do. do.

100 " No. 1 Pompton Charcoal do.

100 " New-Jersey Blooms

50 " New-Jersey Fagotted Iron, for shafts

Best Bars, 1/2 to 4 inch by 1/2 to 1 inch thick.

Do do Rounds and Squares, 1/2 to 3 inch.

Rounds and Squares, 3-16 to 1 inch.

Half Rounds, 1/2 to 1 in. Ovals & Half Ovals 1/2 to 1 1/2 in.

Bands, 1/2 to 4 inch. Hoops, 1/2 to 2 inch.

Trunk Hoops, 1/2 to 1 1/2 in. Horse Shoe & Nut Iron.

Nail Plates. Railroad Spikes.

DUDLEY B. FULLER & Co., 139 Greenwich-st. and 85 Broad-st.

WILLIAM JESSOP & SONS' CELEBRATED CAST-STEEL.

The subscribers have on hand, and are constantly receiving from their manufactory,

PARK WORKS, SHEFFIELD,

Double Refined Cast Steel—square, flat and octagon.

Best warranted Cast Steel—square, flat and octagon.

Best double and single Shear Steel—warranted.

Machinery Steel—round.

Best and 2d gy. Sheet Steel—for saws and other purposes.

German Steel—flat and square, "W. I. & S." "Eagle" and "Goat" stamps.

Genuine "Sykes" L Blister Steel.

Best English Blister Steel, etc., etc., etc.

All of which are offered for sale on the most favorable terms by

WM. JESSOP & SONS,

91 John street, New York.

Also by their Agents—

Curtis & Hand, 47 Commerce street, Philadelphia.

Alex'r Fullerton & Co., 119 Milk street, Boston.

Stickney & Beatty, South Charles street, Baltimore.

May 6, 1849.

JOHNSON, CAMMELL & Co's Celebrated Cast Steel,

AND
ENGINEERING AND MACHINE FILES,
which for quality and adaptation to mechanical uses, have been proved superior to any in the United States. Every description of square, octagon, flat and round cast steel, sheet, shovel and railway spring steel, best double and single shear steel, German steel, flat and square, goat stamps, etc. Saw and file steel, and steel to order for any purposes, manufactured at their Cyclops Steel Works Sheffield.

JOHNSON, CAMMELL & CO.,

100 William St., New York.

November 23 1849.

Railroad Iron.

OF ANY PATTERN AND WEIGHT,

Of a Favorite Brand,

And deliverable in Bond, or Duty paid, at any Port of the U. S., contracted for on favorable terms, by

CHARLES ILLIUS,

20 Beaver St., New York.

Pig and other Iron also contracted for. Sole Agent for "*Baxter's Machine and Burning Oil*"—particularly adapted for "*Railroads*" and other Machinery—Preferred to Sperr by the many now using it, and 25 per cent. cheaper.

CUT NAILS OF BEST QUALITY, BAR IRON
(including Flat Rails) manufactured and for sale by
FISHER, MORGAN & CO.,
75 N. Water St., Philadelphia.

Ogden & Martin's ROSENDALE CEMENT.

WE are prepared to enter into arrangements for supplying our Cement for public works or other purposes. We warrant the cement equal in every respect to any manufactured in this country. It attains a great degree of hardness, sets immediately under water, and is a superior article for masonry coming in contact with water, or requiring great strength.

For sale in tight barrels, well papered, at their office by
OGDEN & MARTIN, 104 Wall st.
February 16, 1850. ly*

The above cement is used in most of the fortifications building by government.

To Steam Engine Builders.

THE Undersigned offer for sale, at less than half its cost, the following *new machinery*, calculated for an engine of 62 inches cylinder and 10 feet stroke, viz.

2 Wrought Iron Cranks, 60 inches from centre to centre.

1 Do. do. Connecting Rod Strap.

2 Do. do. Crank Pins.

1 Eccentric Strap.

1 Diagonal Link with Brasses.

1 Cast Iron Lever Beam (forked).

The above machinery was made at the West Point Foundry for the U. S. Steamer Missouri, without regard to expense, is all finished complete for putting together, and has never been used. Drawings of the cranks can be seen on application to

HENRY THOMPSON & SON,

No. 57 South Gay St., Baltimore, Md.

Sept. 12, 1849.

8,000 Tons Railroad Iron.

THE OHIO AND PENNSYLVANIA RAILROAD CO. wish to contract for eight thousand tons of Railroad Iron, for the eastern division of their road, extending westward from Pittsburgh. Three thousand tons to be delivered on the Ohio river at Pittsburgh and Beaver, before the close of canal navigation in the present year, 1850; and the remainder in the spring of next year. The rails are to be of the H pattern, in lengths of 20 feet, and are to weigh 80 lbs. per lineal yard. They are to be subject to the inspection of Solomon W. Roberts, Chief Engineer.—For further particulars address the President of the Company at Pittsburgh.

By order of the Board of Directors.

WM. ROBINSON, Jr., President.

S. S. Keyser & Co., IRON WAREHOUSE,

Corner of South and Pratt Streets,

BALTIMORE, MD.

Selling Agents for the Rough and Ready Bar Iron and Elk Boiler and Flue Iron Rolling Mills, Sarah and Taylor Furnaces, and Wrightsville Hollow Ware Foundry, and Dealers in Bar and Sheet Iron, and Cast, Sheer, German, Blister, Spring and Electroplated Steel, etc., etc.

Smith & Tyson,

GENERAL COMMISSION MERCHANTS,

No. 25 South Charles St., Baltimore, Md.

AGENTS for the Celebrated Columbia Pig Iron, suitable for Car Wheels and Chilled Rolls.

Columbia refined Charcoal Blooms; Refined Charcoal Juniata Billet Iron for Wire; Refined Iron for Bridging of great strength; Cut Nails, Spikes, and Brads; Railroad Spikes and Wrought Chairs. 22tf

To Railroad Companies and Contractors.

FOR SALE.—Two Locomotive Engines and Tenders, at present in use on the Beaver Meadow Railroad, being too light for their coal trains, but well calculated for either gravel or light passenger trains.

They weigh, in running order, about 8 tons each—having one pair of driving wheels 4 feet diameter, 4 truck wheels 30 inches diameter, with cylinders 10 in. diameter, and 18 inches stroke of piston. Tenders on 4 wheels. Address **JAMES ROWLAND,**

Pres't. Beaver Meadow Railroad & Coal Co., Philadelphia.

or, **L. CHAMBERLAIN, Sec'y,**

at Beaver Meadow, Pa.

May 19, 1849. 20tf

Railroad Instruments.

THEODOLITES, TRANSIT COMPASSES, and Levels, with Fraunhoffer's Munich Glasses, Surveyor's Compasses, Chains, Drawing Instruments, Barometers, etc., all of the best quality and workmanship, for sale at unusually low prices, by
E. & G. W. BLUNT,

No. 179 Water St., cor. Burling Slip.

New York, May 19, 1849.

Rosendale Cement.

THE NEWARK AND ROSENDALE LIME AND CEMENT CO. are now manufacturing at their works in NEWARK, N. J., and Ulster county, N. Y., a very superior article of *Hydraulic Cement*—also Lime Calcine Plaster, etc. Contractors and dealers will find it to their advantage to call or make application before purchasing elsewhere. All communications addressed to the subscriber, at Newark, N. J., will be punctually attended to.

ly*15 **HENRY WILDE, Secretary.**

Patent India Rubber Steam Packing.

THIS article, made by the subscriber, who alone is authorized to make it, is warranted to stand as high a degree of heat as any that has been or can be made by any person—and is the article which has made the reputation of India Rubber Steam Packing and the demand therefor. A large assortment of all thick nesses requisite for any description of engines, steam pipes, valves, etc., constantly on hand and for sale by the manufacturer and patentee, who will give every information regarding its properties, mode of use, etc. at the warehouse.

JOHN GREACHEN, JR.,
98 Broadway, opposite Trinity Church.
New York, October, 1849.

Passenger Car Linings.

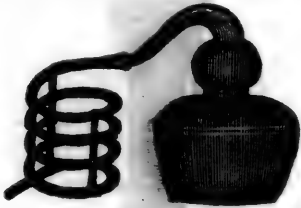
THE Advertiser continues to make to order the Enamelled Car Linings which have been so highly approved the last three years, and are now exclusively used by all the Northern Railroads. No pains are spared to get out new styles, and adapt them to the tastes of every consumer.

Orders addressed to CHARLES STODDER, No. 75 Kilby street, Boston, will have prompt attention.
March 23, 1850. 2m

CAUTION.

RAILROAD COMPANIES and others are hereby cautioned against using or vending our improvement for easing the lateral motion as applied on Railroad Cars. Letters Patent having been granted to us in 1841, any party or parties so making or using said improvement without license from us will be proceeded against according to law.

DAVENPORT & BRIDGES.



P. H. Griffin.

Corner of Steuben and James Sts. Albany, N.Y.
CONTINUES to manufacture copper flues for locomotive boilers, brewers' coppers, stills, tanner heaters, etc. Copper work in general, at the shortest notice. He has constantly on hand brass cocks, brass valves, copper pumps of every variety.
Orders promptly attended to. 1y14

FOWLER M. RAY'S Patent India-rubber Railroad CAR SPRING.

New York and Erie Railroad Shops.
Piermont, March 26, 1850.

This will certify that from practical experience in the use of Fowler M. Ray's India rubber Car Springs, I believe them to be far superior to any others now in use.

I have never known them to be affected by any change of temperature, as other Rubber Springs have been affected on this road.

I am at the present time repairing a Passenger Car that Mr. Ray and myself mounted with his springs about two years and eight months since.

The springs are at the present time as perfect, to all appearances, as when first applied to the car.

Respectfully yours,

HORACE B. GARDNER,
Foreman of the Car Shops.

Supt. Office N.Y. & H. R.R.,
New York, March 8, 1850.

This is to certify that we have used the Rubber Springs manufactured by Mr. F. M. Ray for the past twenty months, "both for Passenger and Freight Car Springs and Bumpers, and of different sizes," and have in every case given entire satisfaction, and I consider them the best spring now in use.

M. SLOAT, Supt.

Harlem R.R. Depot,
New York, March 7, 1850.

This is to certify that we have used Mr. F. M. Ray's India-rubber Springs for over eighteen months, and find them to be easy and durable, and recommend them to railroad companies as being superior to anything we have tried.

J. M. SMART,
Foreman at 42d St. Depot.

Office New Jersey Railroad Co.,
Jersey City, March 8, 1850.

FOWLER M. RAY, Esq.,

Dear Sir: In answer to your enquiries respecting the operation of the Vulcanised Rubber Springs, purchased by our company from you some two years since, I reply that they are superior to any spring in use, (that I have either seen or heard of).

The improved form of your spring, consisting of a solid piece of vulcanised rubber with bands on the outside, is far superior to your first form, consisting of disks of rubber with metallic plates interposed.

The last named form was tried, if you recollect, at a much earlier period; and then was replaced by your last form.

I have no hesitation in saying that your springs have given entire satisfaction, and most cheerfully recommend them to railroad companies throughout the country for the following reasons:

- 1st. The cost is 30 per cent. less.
- 2d. Saving of weight on each car of 8 wheels from 700 to 800 lbs.
- 3d. Less care and attention is required, as they are not liable to get out of repair.
- 4th. A great saving is secured in the wear and tear of the cars and rails from their great elasticity.
- 5th. The freedom from noise.
- 6th. There is greater safety in case of accident, as they cannot be broken.
- 7th. The comfort of passengers is enhanced sufficiently to pay the expense, waiving all the other reasons that I have given.

Should this fail to satisfy any person enquiring, you are at liberty to refer to me, No. 150 Washington St., Jersey City.

Yours respectfully,

T. L. SMITH, Supt.

New York, March 11, 1850.

I have used the Patent India-rubber Spring purchased of Mr. Ray, upon the cars of the New York and New Haven Railroad, and have found them efficient and economical; and when applied to the axles and draw springs, believe them to be quite equal to any in use. I have found a combination of these springs with a steel spring under the transom beam a very satisfactory arrangement, and am now using this plan in all new cars.

Yours respectfully,
ROBERT SCHUYLER.

February 25, 1850.

From practical observation of the use of the India-rubber Car Springs, manufactured and sold by your company, we are entirely satisfied in their application, and do not hesitate to recommend them as elastic, durable, requiring no repairs for years, and retaining their consistency during all extremes of weather. We have applied them for the past two years, and consider them superior for all railroad purposes.

Yours truly,

OSGOOD BRADLEY, Car Builder, Worcester.
T. & C. WASON, do. Springfield.
DEAN, PACKARD & MILLS, do. do.
DAVENPORT & BRIDGES, do. Cambridgeport.

Office of the New Jersey Railroad Co.,
Jersey City, March 7, 1850.

This is to certify that we have had Mr. F. M. Ray's India-rubber Springs in constant use under our cars, and as Bumper Springs for upwards of two years, and they have in every way given perfect satisfaction.

The present form of spring we deem far superior to the form of Disk, having used both forms, although we have none of those made in Disks at present in use.

We take pleasure in recommending these springs to all railroad companies.

J. P. JACKSON, Vice Prest.
New Jersey Railroad and Trans. Co.

Roxbury, February 28, 1850.

In compliance with your request, I take great pleasure in stating the result of my experience in the use of "Ray's Patented Vulcanised India-rubber Car and Engine Springs." We have used them nearly two years, and never had one fail in any way. The cold weather does not affect them, as it has other rubber springs we have used.

With sixteen years' experience as superintendent of machinery on the Boston and Providence railroad, I take pleasure in saying that your springs are the best we ever used, or I ever saw used elsewhere. We have 20 cars rigged with them, of which I can say that the springs are as good now as when first applied. I put 24 lbs. of the rubber under the fore and end of one of our heaviest engines, taking off 250 lbs. of steel springs—it has been in use 18 months, and is in as good condition now as when first put under the engine.

Very respectfully yours,

GEO. S. GRIGGS,
Supt. of Machinery, Boston and Prov. R.R.

Fall River, February 2, 1850.

In answer to yours of the 20th ult. I would say that this company has for some 10 or 12 months past been using "Ray's India-rubber Springs." We have applied them to both passenger and freight cars with uniform success. They have invariably preserved their elasticity and consistency through all the extremes of weather; and we are now applying them whenever the steel spring fails. I am well satisfied that they are particularly adapted for railroad purposes.

Very respectfully yours,

GEO. HAVEN,
Supt. Fall River Railroad.

Jersey City, March 9, 1850.

This is to certify that the present form of Mr. F. M. Ray's India-rubber Car Spring I consider far superior to the form of Disk, having used both forms.

I take pleasure in recommending these springs to all railroad companies.

DAVID H. BAKER,
Foreman of Car Shop of N.J. R.R. & Trans. Co.

Boston, March 5, 1850.

In answer to your enquiry about India-rubber Springs, I have to say that we have used them to a considerable extent on both freight and passenger cars, and also on several of our tenders; and I am very well satisfied that they answer all the purposes for which they are intended. I believe the India-rubber will soon supersede all other springs for cars and tenders.

Yours truly,

S. M. FELTON,
Supt. Fitchburg Railroad.

Old Colony Railroad Office,
Boston, March 6, 1850.

EDWARD CRANE, Esq.,

President New England Car Co.,

Dear Sir: In compliance with your request I would state that the Old Colony Railroad Company have had in use upon their road, India-rubber Springs furnished by your company, for more than eighteen months past, during which time they have been extensively used under Passenger and Freight Cars, Locomotive Tenders, and for Drawer and Buffering Springs, with the most perfect success. The elasticity and consistency of the Rubber has never been unfavorably affected by either extremes of heat or cold—and from the experience which we have had in the use of Rubber Springs, I think them well adapted for railroad purposes—and therefore we have for some months past used Rubber almost exclusively, in all places where springs are required.

Respectfully yours, etc.,

JAS. H. MOORE,
Supt. O. C. Road.

Troy, February 27, 1850.

We have been using your India-rubber Car Springs for nearly two years—and we take pleasure in saying that in our opinion the rubber has to a certain extent already, and may eventually entirely supersede all other Springs for Railroad Car purposes. We now use it entirely for Draw Springs and Bumpers, considering it better and lighter than steel.

During our two years' experience in the use of it, we have not known any to lose their elasticity, or fail in any way; and we cheerfully recommend the rubber for railroad car springs.

Very respectfully,
EATON, GILBERT & CO.

To Practical Machinists.

AN excellent opportunity now occurs to a practical Machinist, of WELL ESTABLISHED REPUTATION, and some capital, to engage extensively in the STEAM ENGINE, BOILER AND FOUNDRY BUSINESS.

An establishment is now ready for business, ample in all its details, including extensive wharf room, for any sized steamboats, and from its position, if properly conducted, will doubtless command a large share of business.

A practical Machinist, as a partner is required, to conduct the whole establishment: and only those FULLY COMPETENT need apply. Address (post paid) "MACHINE CO.," Box No. 741, Philadelphia, Pa. 1m14

Etna Safety Fuse.

THIS superior article for igniting the charge in wet or dry blasting, made with DUPONT'S best powder, is kept for sale at the office and depot of

REYNOLDS & BROTHER,

Sole Manufacturers, 81

No. 85 Liberty St.

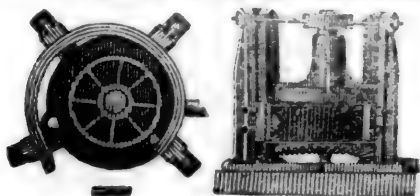
NEW YORK.

And in the principal cities and towns in the U. States.

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November 3, 1849.

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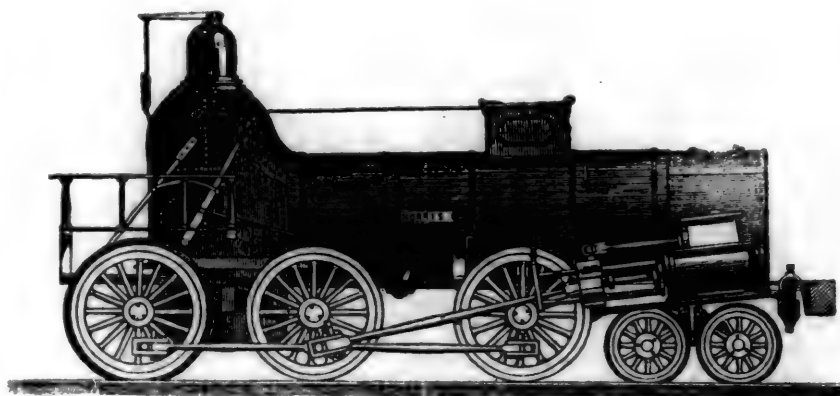
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AMERICAN RAILROAD JOURNAL.

STEAM NAVIGATION, COMMERCE, MINING, MANUFACTURES.

HENRY V. POOR, Editor.

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American Railroad Journal.

PUBLISHED BY J. H. SCHULTZ & CO., 136 NASSAU ST.

Saturday, June 15, 1850.

An Essay on Pen and Pocket Cutlery,

Embracing a Detailed Description of the Mechanical, Chemical, and Manual Operations Performed on Certain Raw Materials, to Convert them into the Means, Implements, and Materials, for Manufacturing Pen and Pocket Knives.

BY A. L. HOLLEY.

CHAPTER III.—BLADES DESCRIBED AND CLASSIFIED. FORGER'S IMPLEMENTS AND APPARATUS. COKE, ITS NATURE AND MANUFACTURE. MARKING, HARDENING AND TEMPERING—DIFFERENT METHODS. TABLES OF COLORS, BATHS, TEMPERATURES, ETC. IMPROVEMENTS. FUEL. BITUMINOUS COAL. CHARCOAL.

Continued from page 354.

Pen and pocket blades are hardened by heating several at once till the color is a bright cherry red, and then plunging them into cold water up to the tang. They are then placed, point upwards, in boxes of steel scales, the tang being wholly buried

therein, that it may gradually cool and be partially annealed. The blades, now hard and brittle, must be slightly softened again, in order to give them a quality intermediate between brittleness and ductility, which shall ensure them proper strength.—They are first rubbed on one face with a fragment of grindstone, burned that it may cut the faster, in order to brighten them, that the temper may be visible as it runs down the blade, and then set up in a row containing some dozens on a steel plate called the tempering plate from 12 to 15 inches long and 6 wide, over a slow fire. Those nearest the twyere heat first, and as fast as they arrive at the proper temperature they are removed by small tongs, and if still heating plunged into cold water, and if right laid aside. The temper for pen blades is 470° F. which is in all cases decided by the eye of the forger, by the color, which is a full yellow. For pocket-blades, the temperature is 509° or 510°, and the color a brown dappled with purple spots. The following is a table of colors which steel exhibits at different temperatures, which vary from 430° when a change of appearance is first perceived, to 360° when they are again quite soft.

Color.	Temperature.
1. Very pale straw yellow	430°
2. Shade darker of yellow	450°
3. Darker straw yellow	470°
4. Still darker yellow	490°
5. Browner yellow	500°
6. Yellow with purple tinge	520°
7. Light purple	530°
8. Dark purple	550°
9. Deep blue	570°
10. Paler blue	590°
11. Still paler blue	619°
12. Pale blue and tinge of green	630°

The colors which steel exhibits at these different temperatures, are caused by the action of the oxygen in the atmosphere on the heated metal. Various other methods of tempering blades of different sorts have been devised, one of which is by heating them over a moderate fire in vessels containing oil or tallow. The appearance and color of the smoke indicates the degree of heat, which if just visible corresponds with the straw color, and if black with the darker colors. Thus the heat may be easily and equally employed. A more correct knowledge of the degree of heat is obtained by immersing a thermometer into a vessel of oil or tallow, and by its aid keeping it at exactly the required temperature. Oil boils at about 600°, and of course in it pen and pocket blades may be temper-

ed. Another excellent method is by placing the steel on the surface of mercury, or of melted fusible alloy, in which is plunged a thermometer graduated to 600° or more, as an index of the heat; as thus hundreds of blades may be tempered at the same time precisely alike. The following is a table of metallic baths, etc., made by Mr. Parkes, a distinguished chemist:

Edge Tools to be Tempered in Various Baths.

	Parts.	Lead.	Tin.	Temper- ature
Lancets—in a bath composed of	7	4		420°
Other surgical instruments	7½	4		430°
Razors, etc	8	4		442°
Penknives, and some implements of surgery	8½	4		450°
Larger penknives, scalpels, etc	10	4		470°
Sissors, shears, garden hoes, cold chisels, etc	14	4		490°
Axes, firmer chisels, plane irons, and pocket knives	19	4		509°
Table knives, large shears, etc	30	4		530°
Swords, watch springs, etc	48	4		550°
Large springs, daggers, augers, fine saws, etc	50	2		558°
Pit saws, hand saws, and some kinds of springs				(Boiling linseed oil. 600°
Articles which require to be still soft- er				(Melted lead. 612°

An excellent way of hardening very large implements and blades, is by cooling them in a case of fusible alloy of 8 parts lead, 2 tin and 5 bismuth in cold water. The case is fused by hot water, leaving the steel free from cracks. A good workman can forge from 18 to 20 dozen pen blades daily, and from 2 to 7 dozen of the largest kinds of pocket blades. The forger's trade is perhaps the most important of all branches in knife making, as the *bean ideal* of pocket knife excellence and beauty, at least, is considered a blade which will cut paper, pens, pine, walnut, nails, pins, etc., and never dull, break, or bend; the handle being a minor point. Some such knives are actually in existence. Forgers in this country are very scarce at present, but Americans are fast becoming masters of this difficult trade. Machinery will not probably be successfully applied to this branch, as the operations are so quickly performed, and must be manual in order to produce good blades, for numerous experiments have proved that the steel of blades, unlike most other substances, will not admit of being "hurried up" into shape by a few jams and strokes from a complicated Yankee contrivance, and retain its virtues and good qualities. "Swaged" are inferior

to forged blades, and the perfect and complex machinery necessary (even if any could be made to answer every purpose) to wield the hammer in different directions, to graduate the strokes, and to heat, hold and turn the bar, cannot as yet be employed as cheap as good forgers. Among the American improvements, the most important is machinery for cutting pocket blades from sheet cast steel, by dies and punches, in order to form with less labor, and very perfectly, the tanges which need not the temper of the cutting part, and which are imperfect and not alike when forged, and need much filing. The whole is left by the press of equal thickness, with a short blunt point, and the faces and swages being forged as those of other blades by the process termed smithing, moothing and tanging being omitted, they possess all the virtues which hammering adds to forged blades. If blades are "fired" and then swaged they are inferior, also those made by a "drop," or other machinery. The process of tanging is omitted in making some forged pocket blades, the tang being cut by a fly press and dies and punches, which cause it to fit without filing. Till some alloy or other metal is used for blade making, the greater share of the labor of this branch must be manipulation, though great improvements can undoubtedly be made in hardening, tempering, tanging, etc.

Fuel is one of the most expensive ingredients in the cost of blades, as well as of other implements, but we have reason to believe that the new mode of decomposing water and burning its oxygen and hydrogen will be perfected, and by its aid heat, the great spirit which impels our machinery, and renders our minerals, metals, and other resources available for use, will cost comparatively a mere trifle. Bituminous coal, now the best fuel known for blade making, indispensable in other branches of manufactures, and the main support of British production at least, "is found in beds or strata in that group of secondary rocks which includes the red sandstone and mountain limestone formations which is commonly called the carboniferous group or coal measures." From the peculiarities of the deposits, the name of coal fields or coal basins is often applied to them. The majority of geological authorities seem unanimous on several points respecting the origin of coal, which are of great theoretical importance. 1st. It is evidently formed from extensive forests, and of exclusively vegetable origin. From this we may infer that the vast quantities of wood which are constantly drifted into the present ocean by some of our large rivers, are now undergoing a similar formation. 2d. From the nature of the vegetables preserved, the climate of the parts where coal exists was both tropical and ultratropical. 3d. The coal strata were undoubtedly deposited in the vicinity, or perhaps on the edges, of extensive fields of dry land; for in regard to position, the trees found in coal beds are often similar to submarine forests. Lastly. The coal strata were singularly elevated and broken by forces probably of volcanic origin. Many coal fields are apparently of mechanical formation, and consist of irregular stratified coal, sandstone, etc. It is obvious from the manner in which the carbonated hydrogen escapes in "blowers" from the strata, where it is greatly condensed and perhaps a liquid, that these depositions, and the transformation of timber into coal, have often been effected under immense pressure, either with or without heat. It is supposed by Messrs. De Lue, Adolphe, Brougniart, De la Beche and others, that coal measures are extensive tracts of vegetable matter, resembling

peat bogs, alternating with sand, etc., which submerged and covered them. They are of equal thickness usually for a great distance, but sometimes irregular, and are seldom worked when less than two feet thick. The nature of the upper stratum or roof is of the greatest importance, which if not strong and compact leaks, and must be artificially supported at great expense. We may observe design in the accumulation of vegetable matter many centuries since, to supply our present wants, and the contorted, dislocated, upturned, twisted and broken strata of coal regions, though interrupting the miner's progress, and in the eyes of superficial observers, frustrating design, are in reality of greater utility than they could be if regular, for the expense incurred in keeping the pits of an unbroken and continuous strata free from water would consume the profits, and cause the coal mining business to be abandoned. The mines of Northumberland and Durham are the deepest in England, being worked more than a thousand feet below the earth's surface. The strata of coal is usually from six to nine feet deep, but one at least in Staffordshire, England, exceeds forty feet in depth.

Charcoal, the fuel so extensively used for preparing materials for knife making, and various other purposes, is a form of carbon obtained by burning wood with the slight access of air, and for fuel is prepared in large kilns, or in pits of conical form; in the latter by piling together pieces of wood, covering them with earth, and burning them slowly for a week or more. A few small openings are left near the bottom, through which the pile is fired, and in the upper part to allow the smoke to escape, and the coal is allowed to cool before the turf is removed. The fragments of wood at the side partially charred are called brands, and are excellent fuel. Cylinder charcoal, one of the ingredients of powder, is made by distilling wood free from resin, as willow, beach, and logwood, in iron cylinders, so constructed as to collect the volatile products, among which are tar and pyroligneous acid. Charcoal is a bad conductor of heat, is not injured by air or moisture, hence posts and stakes are often superficially charred, and is infusible, as without air it undergoes no change in the most intense heat. It absorbs air and moisture, also the odoriferous parts of animal and vegetable substances, and animal vegetable charcoal in particular, will purify tainted water and meats. Carbon is the "pure combustible base" of diamonds, charcoal, and other carbonaceous substances.

Conway and Menai Tubular Bridges.

Professor Cowper has delivered a lecture on this interesting subject at the Royal Institution. The Professor commenced by briefly distinguishing between the real tubular structure of Stephenson and certain foreign bridges from which, as has been alleged, that principle was taken. Thus, the wooden bridge at Schaffhausen, which was destroyed by the French in 1790, and which was supposed to have suggested the tubular form, is proved by a model now in the museum of King's College to have been simply an arched bridge, having a roof as a shelter from rain. The same remark is equally applicable to a bridge at Wittengen and to wooden bridges in America, where the roadways are roofed. The Professor then read a brief notice of various proposals and estimates, by which it appeared that the attention of the legislature had been directed to the urgent necessity of a safe transit over the Straits of Menai since the year 1783. The most elaborate report was furnished by the late Mr. Rennie, who compiled several designs and estimates for bridges, either of cast iron, or partly of cast iron and partly of stone. Prof. Cowper then proceeded to explain and to illustrate by models the principle of a bridge. He showed that the force

exerted on the arch bridge is that of *compression* only—in the suspension bridge the force exerted is that of *extension* only; and that in the bow-and-string bridge, both extension and compression are exerted. It was shown that the same forces are also exerted on the girder, viz: extension on the under and compression on the upper side. This was demonstrated by the following experiment:—wood, tin plate and tin tubes, were successively inserted in a space of about four inches, purposely cut for that purpose in the middle of a girder, where it was also joined. When the tin plate was inserted in the upper side, it bent under the pressure of a few pounds; but when rolled up into a tube it supported more than one hundred pounds. Again, when the same piece of tin plate was fixed to the under side of the girder, where the force of extension was called into action, it would have required several hundred weights to have torn it asunder. Mr. E. Hodgkinson's experiments on the best form of section for cast iron girders were then adverted to. Small experimental girders, devised by that gentleman, were shown. They resemble the letter T. It was stated that the strength of this girder, when the flat side was uppermost, was to its strength when inverted, 1, as 1 to 34. Other forms of section showed that the distribution of the same quantity of material would give differences in strength varying as 54, 11, 15, 19.

It was then explained how wrought iron tubes had been employed by Locke, Brunel, Fox and Henderson, in the bow and string bridges, and by Fairbairn in girders. The insufficiency of ordinary suspension bridges to support railway trains was adverted to; and Prof. Cowper explained a perfectly novel and highly scientific design of a railway suspension bridge, the invention of his son, E. A. Cowper. This bridge, from the principle of its construction, is called "the inverted arch bridge." An arch of an ordinary cast iron bridge, like the Southwalk bridge, is secure in whatever position the load is placed, because the lines of thrust are contained within the arch of plates.—Now, imagine a similar arch of wrought iron plates to be inverted, and a roadway hung to it, then, wherever the load may be placed, the lines of strain will also be contained within the inverted arch of plates, and consequently there will be no deflection of the road. This very original invention is worthy the attention of engineers. Professor Cowper then explained Mr. Stephenson's original proposal to build, without interrupting the navigation by scaffolding, a bridge of two cast iron arches, the centre pier being placed on the Britannia rock. It was shown by a model how two half arches could be built on the opposite sides of a pier—each being tied to, and so balancing, the corresponding voussoir on the other side. Other conditions imposed by the Admiralty, but incompatible with the plan of the railway, induced Mr. Stephenson to adopt the plan of a vast tube. A section, made of rope, comprising the full size of the tube, was suspended from the ceiling of the theatre of the institution; it was 15 feet wide and 30 feet high, and Prof. Cowper stated the length to be 460 feet—above twice the height of the monument. After many experiments on cylindrical, elliptical, and other forms, Mr. Fairbairn adopted that of a rectangular tube, with rectangular cells at the top.—Prof. Cowper illustrated, by experiment, the necessity of stiffness at the top of the tubes, and demonstrated that this was obtained by the cellular form. The Menai tube is made with wrought iron plates varying from $\frac{1}{2}$ to $\frac{3}{4}$ of an inch in thickness, firmly rivetted together with T iron at the joints. The rectangular cells at the upper side are eight in number, and are one foot nine inches square, and there are six similar rectangular cells at the bottom of the tube. The method of putting the tube together, and of raising it by hydraulic presses, was explained and exhibited by a model. The bridge consists of two lines of tubes, extending over two centre spans of 460 feet each. These tubes, when in their places, were joined together by intermediate tubes of about 50 feet over the piers; thus, not only making the length of one entire tube to amount to 1524 feet, but, by the junction, adding considerably to the strength. The weight of the tubes is about 10570 tons. The Conway tubular bridge has been in use for some time, and it is found that an ordinary train deflects the tube about one eighth of

an inch: that hot sunshine causes the heated side to bow out about one inch: that the strongest wind deflects the tube about one inch. It is intended to put sliding stays between the up train and down train tubes of the Britannia bridge, so that they will support each other against the wind. The difference of temperature between summer and winter will expand the entire Britannia bridge about 12 inches; this is provided for by fixing the middle of the tube on the Britannia pier, and allowing the ends to rest on 48 rollers, about six inches diameter in the abutments, the rails in those parts being allowed to slide by each other. On the table were the works of Fairbairn and Dempsey; some plates of the tubular bridge by E. Clark, Esq., the resident engineer; and two models of the Conway and Britannia bridges.—*English paper.*

Qualities and Admixtures of Iron.

In the evidence before the Strength of Iron Commission, it was stated by Mr. Glynn, that the use of the hot blast in the manufacture of iron does not of itself make iron worse or better; but by its means, materials, otherwise intractable, yielding alloys of iron, may be smelted, instead of ores yielding purer metal. Mr. Morris Stirling has not found any distinct difference between the chemical constituents of hot blast and cold blast iron, but apparently there is more carbon in the hot blast iron, and graphite is more commonly to be seen on the surface of No. 1 hot blast than on cold blast iron. Mr. Charles May considers that, by the use of the hot blast, the quantity of carbon which can be combined with the iron is increased. Mr. Hawkshaw and Mr. Fairbairn consider hot blast iron weaker than cold blast: the latter gentleman and Mr. Stephenson state that the use of the hot blast renders the metal very fluid; and Mr. Glynn says that its use is to produce in large quantities, and at a cheap rate, a soft fluid metal, to be employed in light castings, and that in that respect he considers the invention to be of great public benefit, as enabling Scotch iron masters to use a new kind of ore, which, though of a weaker character, further experience may enable them to purify and improve. At the same time the hot blast is essential for smelting the ironstone from South Wales with anthracite coal, and the metal yielded is of the strongest character. Mr. Glynn and Mr. Stephenson mention that generally hot blast iron is dark grey in color, and very fine in the crystal; but it appears to be universally agreed that there is no certain method of distinguishing hot blast from cold blast iron. Mr. Rastrick states that the temperature of the hot blast at the Gartsherrie furnaces was 680° Fahrenheit.

Mr. Stephenson does not attach much importance to the variation in strength of different sorts of iron, but considers that, taking the average of irons generally throughout the country, there is a proximity to a uniform standard. He concluded, from a series of experiments made by him for the High Level bridge at Newcastle, that hot blast iron is more certain in its results than cold blast; that mixtures of cold blast are more uniform than those of hot blast; that mixtures of hot and cold blast give the best results; that simple samples do not run so solid as mixtures; that simple samples sometimes run too hard, and sometimes too soft for practical purposes. Mr. Rastrick would prefer making girders of forge iron. Mr. Hawkshaw would use the Low moor iron. It is however generally admitted that mixing irons from different parts of the country produces the best castings, and since the object in mixing them is to obtain the proportion of carbon to iron which gives the greatest strength combined with the required degree of fluidity, the exact proportion will be regulated by the appearance of the fracture of the several irons. Mr. M. Stirling states that No. 1 hot blast iron, mixed with No. 3 cold blast, will give the right proportion of carbon; but that if iron containing that proportion could be obtained at once from the blast furnace, it would be very superior. Mr. Charles May however observes, that the strength of cast iron depends upon the bulk into which it is to be run as well as upon its constituent parts, and that the art of the iron founder consists in his ability to produce the required amount of strength without any very definite knowledge upon the subject, either chemical or mechanical. Mr. Fox considers a very good

mixture for girders to be cold blast Blaenavon, two thirds, and of hot blast Scotch two sorts, from the black band and the red hematite ores, one third. Mr. Grissell considers the use of old scrap iron to be of immense value, and would use Scotch iron, cold blast Welsh and old scrap. Mr. Fairbairn names as the best mixture, independently of price, Lowmoor, No. 3, 30 per cent.; Blaenavon, or Yorkshire, No. 2, 25; Shropshire, or Derbyshire, No. 3, 25; good old scrap, 20—equal 100 per cent.

Mr. Glynn names one third strong iron from S. Wales and two thirds of the more fluid metal of Yorkshire, Derbyshire and Shropshire. Mr. C. Fox, Mr. Grissell and Mr. May, however, all concur in stating that mixtures of iron practically depend very much upon the commercial question of cost, and it is generally admitted that engineers have no guarantee that the mixture for which they may have stipulated in a contract shall be that used by the founder; hence Mr. Fox recommends that engineers in contracting for a number of girders should stipulate that they should not break with less than a certain weight (leaving the mixture to the founder) and cause one more than the required number to be cast; the engineer might then select any one to be broken, and if it broke with a less weight than had been agreed upon, the whole should be rejected. Mr. Glynn considers that the strongest castings are those cast in the air furnace in dry sand, and that castings in loam are stronger than those in open sand. The metal is more dense and more free from impurity when cast upright.—Mr. Fox and Mr. Fairbairn also prefer the air furnace. With respect to wrought iron, Mr. Stirling considers the processes adapted in its manufacture as capable of great improvement. Mr. E. Clark states, that wrought iron from the same maker is not always the same, and though there is not much difference in the ultimate strength of iron, that some qualities extend much more than others before breaking.—*Mining Journal.*

Change of Internal Structure in Iron.

In the evidence given before the Strength of Iron Commission, Mr. Rastrick mentions that at the Pontypool Iron Works a bar of wrought iron suspended and continually struck by a hammer at the bottom, dropped in two after a length of time, but he knows of no instance of a change of structure on railways. Mr. Hawkshaw, though he has observed crystallization in broken rails and axles, has not traced it directly to vibration; he thinks mill-gearing and shafts would furnish good examples, though when they break, the various circumstances under which the fractures have taken place should be observed. Mr. Grissell has observed that the vibration to which crane chains are exposed changes the iron from very beautiful malleable iron to the crystalline appearance of cast iron.—He does not consider that cast iron is subject to the alteration of structure. Mr. Fox considers that vibration does produce a change in the internal structure of wrought iron, and instances that if the thread of a screw be cut in a wrought iron bar, and that the bar be broken across the tapped part the fracture there will be found more crystalline than at the other part; he mentions the frequency with which shafts and mill gearing break, and states that cold hammering the axles to give them a high polish changes their internal structure; but instead of remedying the injury by annealing, he recommends that they should be finished at a high temperature. Mr. Grissell mentions that chains of cranes often break with a crystalline fracture, which he attributes to a change in the internal structure, but he does not consider the same effect is produced in cast iron. Mr. Fairbairn states, that repeatedly making a wrought iron bar red hot, and plunging it into cold water, renders it crystalline, and that the fibrous texture may be restored by annealing; he considers that percussion renders the fibres more liable to break off short, but that, without it is sufficient to cause a considerable increase of temperature, it does not produce any real internal change. Mr. Glynn considers that the structure, both of wrought and cast iron, is altered by a succession of blows, the wrought to a crystalline structure, the cast to larger crystals; he has observed this appearance particularly in axles, mill shafts, toothed wheels, crow bars, and crane chains; the latter, even when especially made of strong fibrous

iron, require to be annealed after about three years: the axles of tenders to which breaks have been applied he mentions as particularly subject to this change. He attributes the alteration to galvanic action, induced by the alloys from which iron is never entirely free, and considers that the action is increased by blows. He also mentions that brass wire, of copper and zinc, originally tough and fibrous, continually breaks off short with a crystalline fracture, radiating in the form of a star, showing a change in the structure such as would have taken place if the metal had been melted and had crystallized in cooling: this effect is more rapidly produced in an atmosphere containing sulphuric acid. Mr. W. H. Barlow mentions having caused a piece of fibrous iron to be hammered for a long time by a blacksmith, and that he found the iron changed from a fibrous to a crystalline structure; but as axles do not undergo the same sort of hammering, he does not know whether the same effect takes place in them. Mr. Stephenson considers the fact of an alteration of structure as highly improbable, and cites the connecting rod of an engine having vibrated 25,000,000 times, and yet being perfectly fibrous. In the cases of axles the iron may not have been fibrous in the first instance, for though when a piece of iron is rolled from 1 foot in length to 20 feet it necessarily becomes fibrous, it does not necessarily become so when rolled from 1 foot in length to 6 feet. He says that in all cases of change of structure which he has heard of there has always been some important link wanting.—Mr. Locke considers that concussion would alter the structure of iron, but would not offer an opinion as to whether the fracture of axles arose from that cause; he mentions that a great many axles broke when the crank axles were in use, but that since straight axles have been adopted fewer breakages have occurred. Mr. I. K. Brunel doubts the change of internal structure, and thinks the various appearances of different fractures result as much from the mode in which the iron has been broken as in any change in structure, and that change of temperature will also produce a variation in the fracture; that iron in a cold state shows a more crystalline fracture than the same iron warmed a little, and that wrought iron does not actually become crystalline and fibrous, but breaks either fibrous or crystalline according to the combination of circumstances under which it is broken, but with the combination required he is not acquainted; he cites the stratification and planes of cleavage of rocks, which may be broken with different fractures according to the mode of applying the blow. Mr. Brunel exhibited various specimens broken, some with a fibrous fracture by means of a slow heavy blow, and some with a crystalline fracture, by means of a sharp short blow. Mr. Charles May cites the beam of a steam engine as an instance of continued vibration not affecting iron, and mentions as an instance in favor of the change in iron from percussion the fact that a gun used in his works to break pig iron across, at last dropped in two as if it had been cut.—*Min. Jour.*

Analyses of Cast Iron.

Mr. F. C. Wrightson, of Birmingham, has communicated to the Chemical Gazette an interesting paper on this subject, of which the following is an abstract:—The effect of phosphorus, in producing what is termed cold short iron, has long been admitted; but that the use of hot blast occasioned an increase of phosphorus, the author thinks never has been suspected—at all events, never announced. To elucidate this point, and also of furnishing more complete analyses of cast iron than had yet been done, Mr. Wrightson undertook a series of experiments, thus described:—The specimens were easily broken to small pieces in a steel mortar. In one portion of from 20 to 30 grs., the sulphur and phosphorus were determined. In a second quantity all the other constituents were determined, except the carbon. On being treated with HCl and warmed, the iron is quickly acted on, and in a few hours dissolved, leaving black flakes and particles floating in the liquid. These were collected on a filter, previously dried at 212°, and weighed. After well washing, until no trace of HCl remained, the filter was again dried and weighed. The increase was carbon principally, with small quantities of silicates of oxide of iron, lime, &c., and in the num-

bers VII and VIII, iron is an equivalent proportion to the carbon. In these latter, as also in the numbers I. and III., the silica, iron, &c., of the substance separated by the filter were determined by fusing it with nitrate of potash mixed with twice its weight of carbonate of soda; the iron, &c., separated in the usual manner, gave the carbon by loss. This was afterwards verified in two instances by a direct determination of the carbon in a combustion tube. The iron, &c., separated in the above manner, was added to that obtained from the solution. The carbon was designated *b*, and being deducted from the entire quantity found in the iron by the method to be detailed, gave the quantity of carbon designated *a* for the reason before named.—The filtered liquid and washings, evaporated to dryness and again treated with acid and water, usually left a minute portion of silica, which was separated, weighed, and added to the former quantity. A current of sulphuretted hydrogen being passed through a small quantity of the solution, it in no case gave any other than a milk white precipitate of sulphur. After being carefully freed from this, and from SH, it was returned to the main solution, NO⁵ added, and boiled until all the iron was peroxidised, and ammonia added gradually, until the solution only faintly reddened litmus, and nearly all the iron was precipitated. A little neutral benzoate of ammonia separated the last portions of the peroxide of iron. The precipitate, after well washing, was dried, ignited, weighed, and examined for manganese by fusion with nitrate and carbonate of potash; for chrome and alumina by dissolving in ClH, and precipitating with caustic potash in excess; only minute traces of alumina were occasionally found in the potash. But the peroxide had, in one or two instances, to be re-dissolved, and the manganese separated afresh. This occurred when ammonia had been added to the solution in excess, and a few drops of HCl added, which were not sufficient to neutralise or acidify the whole of the solution, which, from being very bulky, required care in neutralising. When the entire solution, after attaining the requisite degree of acidity, was transferred from one vessel to another, so as to obtain a uniform mixture; then no trace of manganese was found with the iron. From the amount of peroxide the percentage of iron was calculated. Before proceeding to separate the manganese, the solution and washings were evaporated to dryness, and the salts of ammonia driven off by ignition to redness. This, I had found, from repeated trials, was absolutely necessary, in order to separate the whole of the manganese by hydro-sulphate of ammonia. After ignition, the residue was always of a brown color from the peroxide of manganese; a drop or two of HCl dissolved this. Ammonia and hydro-sulphate of ammonia were then added, and the solution allowed to stand for several hours, and gently warmed. The sulphuretted manganese thus separated was converted into sulphate of manganese, from which the per centage of manganese was calculated. In one or two cases, where small quantities of nickel and cobalt were present, these were left as sulphurets on the filter, when the sulphuretted manganese was dissolved by dilute sulphuric acid. The solution, after getting rid of the excess of hydro-sulphate of ammonia, was neutralised, and oxalate of ammonia added.—The lime thus separated was converted into carbonate; and from it the proportion of calcium deduced. A drop or two of the solution, with phosphate of soda, occasionally indicated very minute traces of magnesia; these were overlooked. After separating the lime, the solution was evaporated to dryness, ignited in a platinum capsule, and the residue, consisting of the alkaline chlorides, weighed; a few drops of solution of bi-chloride of platinum being added to the moistened salts, the potash was separated (when sufficient in quantity to weigh) in the usual manner; the weight of the chloride of potassium calculated, and deducted from the weight of the mixed chlorides; the loss gave the weight of the chloride of sodium. Further delicate experiments were resorted to, for the purpose of determining the quantity of sulphur, phosphorus, carbon, and nitrogen; the traces of ammonia were so minute, as to render it questionable whether they might not have been obtained from the atmosphere of the laboratory. From eight of a numerous variety of experiments on the iron ores of

South Staffordshire, he found the difference in the per centage of phosphorus in hot and cold blast iron to be as follows:—

	1.	2.	3.	4.	5.	6.	7.	8.
Cold blast.	0.47	0.41	0.31	0.20	0.21	0.36	0.03	0.36
Hot blast.	0.51	0.55	0.50	0.71	0.54	—	0.07	0.40

The specimens of iron ore were from the Level Iron Works, near Dudley, belonging to Lord Ward, to whose agent, Mr. R. Smith, he expresses his grateful acknowledgments for the trouble and expense incurred in forwarding the investigations, and observes that, if the ironmasters as a body exhibited the same degree of interest in the improvement of their manufacture, there would be such changes introduced as would prove of great national benefit; but at present *quantity* is the object, *quality* altogether beside the question.—*London Min. Jour.*

The English Iron Trade.

The results of the proceedings of the preliminary meeting at Birmingham, reported in the Journal of the 30th March, were typical of what has transpired at the general meetings of Wolverhampton and Birmingham, on Wednesday and Thursday last. The conference was marked by decided flatness, and although prices were nominally maintained, it appears, since the preliminary meeting, they have been modified, to meet the peculiar circumstances of individual firms. Too much importance must never be attached to the decisions of these quarterly meetings, further than as superficial indications of the condition of trade; for, although the larger firms, through whose influence the prices are fixed, may generally abide by the terms agreed on, it is a well-known fact that they are constantly being undersold by needy manufacturers, who are forced to sell, and are too often happy to make sales at greatly reduced prices. Nor are these the only parties who swerve from the engagements entered into—holders of large stocks are often, in spite of resolutions at quarterly meetings, glad to make sales at a lower figure, or disguise the transactions under the shape of a discount. It was publicly stated in Wolverhampton that, although present prices are not sufficiently remunerative, the leading firms are prepared, in the way of discount, should circumstances arise to render such proceeding necessary, to make those reductions in price which the extent of sales, or state of the iron market, may require. This, certainly not satisfactory state of affairs may be attributed to various causes; the great excitement which prevailed four or five years since has subsided, and that excitement, the result of railway speculation, which intoxicated the proprietors of iron works, has led to a fearful collapse. There is little doing. Speculative men who engaged in railways—some of the most influential ironmasters of the district—have been seriously injured by embarking in local undertakings, more especially in the Oxford, Worcester, and Wolverhampton lines; and, as may be easily conceived, few people possess spirit, much less money, to embark in any trade except that in which the return is not only certain, but immediately profitable. Many orders given some time since have been suspended, and the present state of our commercial negotiations with the United States, particularly in relation to the exportation of iron from this country, promises greatly to aggravate existing evils. It is feared by many largely interested in the iron manufacture of this neighborhood, that the efforts of Sir Henry Bulwer, at Washington, to obtain a modification of the American tariff, with respect more especially to the importation of iron, will prove abortive for some time to come. Our exports of iron from South Staffordshire are said to be already considerably reduced, and should our transatlantic friends continue, as they threaten, their restrictive commercial policy, business in these important manufacturing districts must of necessity be still more limited than it is at the present moment. The wages of the workmen are extremely low; not more than two-thirds of the works are employed; and last week upwards of 2,900 were relieved by the Wolverhampton Poor-law Union.—The iron trade of South Staffordshire is unquestionably at the present moment, like that of South Wales, entirely speculative. Prices, although declared by quarterly meetings, are altogether arbitrary, and must be considered as regarded by cir-

cumstances. They are quoted to-day as follows: Bars, £6; rods, £6 to £6 10s.; hoops, £6 10s.; sheets, £7 10s.; pigs, £3 to £3 5s. These are the nominal prices of the present quarterly meetings, so far as they have been held, although purchases could be made below these prices; but little certainly can, however, be felt, until the concluding meeting at Dudley, on Saturday night. At the Birmingham meeting, on Thursday, the tone of the market was gloomy; however, all the usual bills and acceptances were satisfactorily settled. There is a general feeling, too, that on the opening of the Stour Valley line of railway a much greater development of the mineral produce of the district will take place for the supply of the metropolis, and that the supply of Staffordshire coal, in particular to London, will become a great trade. Among all these matters, information under the stringent Act of Lord Hatherton, against the "tommy" system, have been laid by wholesale—70 convictions have taken place in the Walsall district alone, and in other parts of the iron and coal fields of Staffordshire, prosecutions are still going on. Although there is little doubt that the profit on the goods sold is the main object, the excuse often is that the master cannot carry on his works and pay in cash; and in some instances the stoppage of the system has led to the closing of iron works, which accounts for the number of unemployed receiving parochial relief. The system is, however, fraught with evil; the party practising it commits a fraud on the fair manufacturer, who pays in money, and also on the retailer, who deals in the necessities of life and the sooner it is abolished the better.—*London Mining Journal.*

The New York Courier publishes the following correct table of the distances between Boston and Liverpool, and between New York and Liverpool:

Distance from New York to Liverpool.

From Battery, New York to Sandy Hook	17 miles
From Sandy Hook to lat. 40 40 N. long.	
69 W. course N. 84, 45 E. true	229
From lat. 40, 40 N. long. 69 W. to lat.	
51, 12 N. lon. 9.39 W. course N. 75.39	
E. true	2550
Cape Clear would then bear N. true 14 miles distant.	
From position off Cape Clear to Coburg dock, Liverpool	288
Total	3084

Distance from Boston to Liverpool, via Halifax.

From dock in Boston to Boston light bearing N. N. W. true 4 distant	9 miles
From position off Boston light, lat. 43, 19 N. lon. 65.21 W. course N. 76.29	
E. true	252
Barroco Point, Nova Scotia, would then bear N. W. true 10 miles distant.	
From position off Barroco point to Sombro Island light, bearing W. true 2 miles distant N., 50.37 E.	107
From position off Sombro light to Halifax	12

Distance from Boston to Halifax	380 miles
From Halifax to Sombro light bearing W. true 4 miles distant	12 miles
From thence to lat. 46.30 N. long. 53.04 W. course N. 75.00 E. true	453
Cape Race would then bear N. 9½ miles distant.	
From position off Cape Race to lat. 51, 12 N. long. 9.29 W. course N. 64.23	
E. true, great circle sailing	1716
Cape Clear would then bear N. true 14 miles distant.	
From off Cape Clear to dock in Liverpool	288

Total distance.....2849 miles

Recapitulation.

From New York to Liverpool direct	3082 miles
To Liverpool via Halifax	2849
Differ in favor of Boston	235 miles

Ship Building in New York.

We see daily many interesting items of news in the columns of the New York *Sun*—among which we find the following on ship building in that paper of Tuesday, which we transfer to our columns.

At the yard of Wm. H. Webb are two fine crafts under way. The first is to replace the Caleb Grimshaw, that was recently destroyed by fire. She is 180 feet long, 40 feet beam, and 22½ feet depth of hold; and has been contracted for by Messrs. Thompson, Nephew & Co. She will be launched about the middle of August, and is to be commanded by Capt. Hoxie, formerly of the Grimshaw.—The other is a steamship for Messrs. Spofford, Tilleson & Comp'y., intended to take the place of the Northerner, which was long since placed in the California trade. She will be named the 'Union,' and commanded by Captain Budd. The length of her deck is 212 feet, 34 feet beam, depth of hold 22 feet, and will be launched about the 1st of September.

Messrs. Smith & Dimon are now building an elegant packet ship for Messrs. Goodhue & Co., of the following dimensions: 152 feet in length, 33 ft. beam, and 18 feet in depth. She is nearly completed and will be launched in a few days.

The enterprising builders, Messrs. Westervelt & Mackey, have two extensive ship yards, one at the foot of Third street, East River, and the other between Seventh and Eighth streets, where there are three handsome steamers and two packet ships rapidly approaching completion. At the former yard, is a large steamer, building for the Havre trade, to run in connection with the Franklin, the dimensions of which are 283 feet in length, 40 feet beam, 27 feet depth, and about 2700 tons burthen. This vessel will be launched in the latter part of August.

Another steamship, intended for the California trade, has been contracted for by Messrs. Davis, Brooks & Co. She is to be 220 feet long, both deck and keel, 36 feet beam, 22 feet deep, and 1600 tons burthen, and will be ready for her machinery by the last of September.

At the same yard is a beautifully modelled packet ship building for Messrs. E. W. Hurlbut, who intend to place her in the trade between New York and Havre. She is 165 feet on deck, 36 feet beam, 27 feet deep, and about 1100 tons burthen, and will be launched about the 18th of August next. Capt. Doane is to be her commander.

At the branch yard of Westervelt & Mackey, foot of Third street, is a ship of 173 feet in length, 37½ feet beam, 22½ feet in depth, and 1150 tons burthen, now building for her owners, Messrs. Boyd & Hincken, who will place her in the Havre line of packets as soon as she is completed. She will be commanded by Captain Willard, formerly of the Oneida, that was lost some time since.

Charles Morgan, Esq., proprietor of the Morgan Iron Works, has contracted with Westervelt & Mackey to build him a steamboat for the Southern trade, which has been commenced, with a keel 193 feet long, 23 feet beam, 18 feet depth, and 1200 tons burthen. She will not be ready to launch until the close of the summer.

Messrs. Platt & Son, of Philadelphia, have contracted with Jacob Bell, to build a large ship for the Canton trade, which will be ready to receive her rigging about the 12th of July. She is 190 feet long, 36 feet wide, 21 feet deep, and of about 1200 tons burthen. Capt. Lockwood is to take command of her.

The keel (220 feet long) for a mammoth ship

was laid by Jacob Bell, and when finished will be used as a Liverpool trader. As yet it is not known in whose line she is to be placed.

Wm. H. Brown, Esq., the Messrs Colliers of this city, and Perrin, Patterson & Stack of Williamsburgh, are all busily engaged in completing several large vessels, a description of which will be given in the "Sun" in a few days.

Chemical Constituents of Iron.

In his evidence before the Strength of Iron Commission, Mr. Morris Stirling states, that iron in its pure state is malleable, and that it is a combination of carbon with iron which produces cast-iron. In addition to carbon, the cast iron in this country contains silica, lime, magnesia, alumina, occasionally some of the phosphates and other admixtures; but iron made from magnetic ores is much purer. The strength of cast iron depends upon its freedom from impurities, and upon the proportion of carbon it contains. The strongest cast iron contains about three per cent. of carbon, or according to Mr. Charles May, when the carbon is in the smallest proportion that produces fluidity; a larger proportion tends to make the iron soft and weak, and a smaller hard and brittle. Mr. Glynn states, that the strongest iron generally shows a clear grey, or slightly mottled fracture, and he considers that the color indicates the combination of carbon with iron which produces the greatest strength. Mr. Stirling states, that while color is admissible as a test of strength, it is not so of chemical constitution, for though dark colored iron is usually weak, grey iron usually strong, and white iron usually brittle, yet black iron when chilled becomes white, although it must be supposed to contain the same quantity of carbon; hence, as a general rule, he concludes that color indicates the treatment to which iron has been subjected, and in some cases only the quantity of carbon. Mr. May coincides in considering the question of strength to be very much reducible to the quantity of carbon contained in the iron, as some of the tenderest iron skilfully treated will produce some of the strongest castings. Messrs. Stephenson and Stirling mention that the fluidity of the Berlin iron is due to the presence of arsenic, and the latter has observed that manganese mixed artificially with cast iron closes the grain, and is an improvement both to cast iron and steel. On wrought iron the effect of manganese is stated to be to give it the hot-short property, while cold short is produced by the presence of a small quantity of phosphorus; and the admixture of arsenic renders wrought iron hard and brittle.—*Mining Journal*.

News from the Copper Region.

The propeller Napoleon returned on the 23d. being the first vessel down this spring. She went up as far as the Ontonagon river, and made a quick and pleasant trip. We gather the following particulars from passengers, who are directly from the mines. The working companies are everywhere meeting with success; commencing with the western mines at Ontonagon, the Minnesota company, during the winter, have extended three shafts to the depth of 85 feet, connecting them by a level, at that depth 300 feet in length. They have completed an adit for drainage, 350 feet in length, which will drain their mine to the depth of 85 feet.

In these openings, by partial stoping, they have raised for shipment about 65 tons mass copper, together with the usual quantity of barrel and stamp work. A stamping mill is being erected which will enable the company, with their extensive mining operations, to ship three or four hundred tons of copper this season.

At the Forest mine a new work was commenced last fall and great progress has been made in opening it during the winter—it promises well and has the same show of native copper as the other mines in this vicinity. Mr. Hodge, editor of the mining department of the American Railroad and Mining Journal, went up on the first boat to take charge of this mine, and is making preparations to work a large force of men during the summer.

The Adventure company have been working but a small force, the mine promises well in native copper. Now that the Pittsburgh and Boston com-

pany have bought half of this mine, it is expected that the working will be greatly enlarged.

The Aztec and Ridge mining companies have been doing considerable, principally in the way of exploring, and have met with success, beyond their expectations in the discovery of rich veins; and they are making preparations to work extensively this season.

The Douglass Houghton company's veins are being worked under the direction of C. C. Douglass, Esq., and are now in a most promising condition. They have taken out considerable stamp work and some large masses of copper, and from appearances it will soon rank with the best mine on the lake. Shipments of copper will be made from this location during the season.

The Algonquin mining company are proposing to renew operations this spring on a large scale, under the superintendence of J. R. Grout, Esq., and from the richness of their veins they will undoubtedly meet with success. This interesting section of the lake country, so recently explored and made known, is fast rivaling Keewenaw Point in its richness in native copper and in population. The farming interests of this region are beginning to receive more attention, and from the fertility of the soil and the inducements for furnishing supplies to the mining companies, will undoubtedly rapidly increase.

Passing to Keewenaw Point, the North American mine has been doing well—they have raised considerable copper during the winter and will make large shipments during the season.

The Cliff mine is worked with the usual success and will, no doubt, produce the usual quantity, a thousand tons or more, of copper this season. The Northwest mine has been extensively opened during the winter, and fifty or sixty tons of copper have been raised, and is improving in appearance as the mine is opened. The Northwestern company are preparing to renew operations. They have veins of undoubted richness and well situated for being worked to advantage.

There are also several new companies making arrangements for commencing operations on the Point. Several tracts of mineral land have been entered at the Land Office, both on the Ontonagon and the Point, and the greatest confidence is felt by every body in the country at the success of the working companies. New interests are springing up, and new explorations going on this spring that shows increased confidence in the copper and iron mining business of Lake Superior. And it is a matter of congratulation that this valuable section of mineral country, so remote from the settled portions of the United States, and in which a heavy expense attends the development of its mineral wealth, is about to realize the anticipations of the most sanguine in its favor.

We hope to have it in our power to give in our next an account of the progress of the iron mines at Carp river, and now that we shall be able to get almost weekly intelligence from every portion of the mineral country, we shall endeavor to procure, as often as possible, particular accounts of the working and progress of each mine.—*Lake Superior Jour.*

Improvement of the London Sewage.

Among the numerous plans for improving the sewage of London, and at the same time preserving the Thames from pollution, which were sent in to the Commissioners of Sewers a few weeks since, is an ingenious one from Baron Von Rathen, for raising the manure into elevated tanks by the force of compressed air. He proposes to form a certain number of central, or main sewers, along certain principal thoroughfares, to lifting stations in the various suburbs. The sewage water is here admitted into sump of large dimensions, connected with which is the lifting apparatus; it consists of two air-tight iron tanks, beside the sump, having each a valve or lock, which, opening and shutting, admit the sewage liquid alternately into each. Through the top of each tank a pipe descends nearly to the bottom, the other end of which is carried over the heads of cisterns placed at any elevation, and bent down through an opening in their tops.—From a compressed air reservoir connecting pipes are carried to the air-tight chambers, the valves of which also work alternately, but in contrary direc-

tions to those opening into the sump; the consequence is, that as soon as a sufficient quantity has flowed into one air-tight tank, and its valve closed, the compressed air valve immediately opens, and the liquid is forced up through the pipe before mentioned, and flows into the cisterns, from whence descends one pipe to conduct it away to manure any district, and another for filling close tanks on wheels, to be carried where it might be required. Of course the most economical way at present known of compressing air for such a purpose would be by steam power; but the baron states that he has a *new power engine, without fire*, a description of which we should be happy to be favored with.—*Min Jour.*

Chesapeake and Ohio Canal.

The Cumberland Civilian of Friday says: "On Monday next it is understood the water will be let into the canal for the distance of some seven or eight miles, the length of the first level, commencing at this place—with the view of trying the bank. In a short time the experiment will be continued further down the line until the water communication becomes continuous to dam No. 6. This is, indeed, an earnest of speedy completion. We have also been informed since the above was written, that on Saturday the water will be let in on the levels near locks 69, 70, 71, in the neighborhood of Oldtown."

The water has been let off the lower part of the canal, for the purpose of repairs, which will probably occupy some five or six weeks. When it is again opened we hope that the trade will extend as far as Cumberland.

The Civilian also says that, in anticipation of the completion of the canal, there is an unusual activity among the mining companies of the Cumberland coal fields. All the companies are preparing to do a large business, and many which heretofore have had but limited facilities for transportation to market, are making extensive arrangements for the operating of the regular coal trade.

New York.

Syracuse and Binghamton Railroad.

The above project has recently been renewed under auspices that give every promise of success. Nothing has been wanting, but that those interested in it should be fully aroused to its importance. They have abundant means for its construction, and these means they now intend to make available to the work.

A large meeting in aid of the road was held in Syracuse on the 4th inst., at which was submitted the report of the committee consisting of Harvey Baldwin, John Wilkinson, Hiram Putnam, Townsend Ross, and Nathan Randal, Esqs., appointed at a previous meeting to prepare tables of the cost, business and income of the road, etc. From this report it appears that the road will be about 7 miles long, running through the counties of Onondaga, Cortlandt, and Broome, one of the finest portions of the State. The whole cost is estimated at \$1,400,000, or \$20,000 per mile.

This road when completed will be as the committee state in their report form one of the links in the great chain of railroad communication running from the north to the south bounds of the United States—terminating on the north at Oswego, and on the south at Mobile—and passing through a country rich in mineral and agricultural wealth, and through innumerable villages, and some of the principal cities of the Union. With this constructed, there would remain but about 40 miles to connect us with the railroads of Pennsylvania—thus giving us a direct route across the country to Philadelphia, Baltimore and Washington, and at the

same time bringing us in connection with the North branch canal and other canals in the State of Pennsylvania.

The committee estimate the business of the road as follows:

Freight on 100,000 tons of coal for the salt works and domestic use, and the Lake trade at \$1 per ton.....	\$100,000
Add for return freight, salt, gypsum, lime, hydraulic cement, lumber, flour from the Oswego mills and other places, grain, neat stock and other produce 38,000 tons equal to.....	\$75,000

Making, on these articles alone.....	\$175,000
Add to these for merchandise to be shipped from New York, Philadelphia, Baltimore, and other places including cast, pig, and bar iron and nails, from the mines of Pennsylvania, 25,000 tons, equal to.....	\$25,000

And it gives the gross sum of.....\$200,000

Transportation of through and way passengers, and the transportation of the mail, and which are estimated as follows, viz:

Through passengers, 200 per day, at 2c. per mile.....	\$37,640
Way passengers, 100 per day, at \$1 each.....	31,300
Transportation of the mail at \$150 per mile.....	10,500
Making, of probable rates, a grand total of.....	\$79,440
The expense of running the road, including ordinary repairs per annum, 3 daily trains each way, is estimated at.....	\$107,482

This being deducted, leaves a net balance of.....\$172,958 or about 12 per cent. for annual dividends.

These estimates are based upon the present wants of the country without taking into calculation the great increase from the increased facilities and rapid growth of country, and it will be seen that from these sources alone the road would make rich returns to its stockholders.

The route will be very nearly level. This, together with the importance of its connections, and the rich and populous country through which it will run cannot fail to make it a paying road, in our estimation. It will form an important tributary to that great work, which is now in condition to extend to this new project if required.

With the two great lines of railroad traversing the State from east to west, and the numerous cross roads, which, at very short distances, will be constructed from one to the other, the people of New York will be well supplied with every convenience for locomotion.

Auburn and Rochester Railroad—Election of Officers—The Consolidation, &c.—At a meeting of the stockholders of the Auburn and Rochester railroad company, held yesterday, June 3d, at Canandaigua, the following persons were elected directors of said company—

Henry B. Gibson, Charles Seymour, Oliver Phelps, Jacob Gould, E. Darwin Smith, Joseph Fellows, William V. J. Mercer, William F. Weld, Nathl. Thayer, Robert H. Ives, William A. Sackett, John H. Chedell, Horace White.

Henry B. Gibson was unanimously re-elected President; Jacob Gould, Vice President; Charles Seymour, re-elected Secretary and Treasurer; and Asa Sprague, Superintendent.

The board of directors, we understand, approved and adopted the plan of consolidation with the Auburn and Syracuse company, recommended by the committee of the two corporations at their meeting in Boston, and resolved to insist on the consolidation on the 1st of August, and to concur in no delay beyond that period. They also deputed a committee to confer with the straight line company;

and procure the transfer of its rights, etc., consisting of Henry B. Gibson, John Wilkinson, Nathaniel Thayer, William F. Weld, R. H. Ives, and E. Darwin Smith, so as to be prepared to complete such transfer within the four months allowed by the act for the consolidation of said companies.—*Advertiser.*

Syracuse and Utica Railroad Company.—At an annual election held in Syracuse, the following gentlemen were elected directors for the year ensuing, viz:

John Wilkinson, Charles Stebbins, Oliver Teall, David Wager, Hamilton White, Samuel French, John Stryker, Joel Rathbun, Holmes Hutchinson, Ira Hawley, James Hooker, Elias W. Leavenworth and James Watson Williams.

John Wilkinson, Esq., was unanimously re-elected President of the said company for the ensuing year; and Hon. Charles Stebbins, was in like manner elected Vice President.

At the annual meeting of the stockholders of the Attica and Buffalo railroad company, held June 3d, 1850, the following gentlemen were chosen directors for the ensuing year:—William Sturges, Samuel Dana, Cyrus C. Dennis, Daniel W. Tomlinson, Harvey Putnam, Dean Richmond, Gains B. Rich, Horace White, Aaron Rumsey, Henry Martin, Stephen King, Charles H. Lee, Francis H. Tows.

At a subsequent meeting of the directors, Henry Martin was chosen President, and Dean Richmond Vice President.

Troy and Boston Railroad.—The ground was broken yesterday by the citizens of Troy, for a railroad between that city and Boston via Fitchburgh. The Mayor of Troy, the Common Council, several military companies, Mr. Briggs, Mr. Hadley, Gen. Wool and others participated in the ceremony. This is a laudable enterprise, and we commend the public spirit, intelligence, and liberality which suggests and carries forward such works.—*Albany Evening Jour.*

The Buffalo Republican says: "We understand that the directors of the Buffalo and Attica, Tonawanda, Auburn and Rochester, and Syracuse and Utica railroads have passed resolutions authorising a committee appointed by each road to immediately subscribe 5 per cent. on their capital stock to the Buffalo and State Line road. This amount, in connection with the subscriptions of individuals, makes an available capital of over \$500,000—sufficient to insure the immediate completion of the road to the State line. It is expected that the Albany and Schenectady, and Schenectady and Utica roads will also subscribe five per cent. on their capital stock. A meeting of the different committees will be held in this city in a few days to complete the subscription."

The receipts on the New Haven railroad for May show a continuance of the favorable condition of the traffic of that road. The increase, it will be seen, is large, and as yet nothing but a passenger business has been done:

<i>Receipts of New Haven Road for May, 1850.</i>	
Passengers.....	\$42,841 15
Commutation, Freight, etc.....	3,689 11
Total.....	\$46,530 26
Deduct paid other lines.....	5,898 85
	\$40,631 41
Same month in '49.....	28,968 25
Increase (equal to nearly 75 p. ct.).....	\$16,664 16

Ogdensburg Railroad.—The annual meeting of the stockholders of this road was held in Champlain, on the 26th ult. The following gentlemen were elected directors:—T. P. Chandler, Robert G. Shaw, Benjamin T. Reed and J. W. Edmonds, of Boston; Isaac Spaulding of Nashua, N. H.; Chas. Paine of Northfield, Vt.; J. L. Russel, Canton, N. Y.; Hiram Horton, Malone, N. Y.; George Reddington, Waddington, N. Y.; George V. Hoyle, Champlain, N. Y.; James H. Titus, New York city; G. N. Seymour and Henry Van Rensselaer, Ogdensburg. T. P. Chandler was re-elected President; William T. Eustis, of Boston, Treasurer; and James G. Hopkins, Clerk. Colonel Charles L. Schlatter remains Chief Engineer and Superintendent. The whole line (117 miles) is expected to be ready for business operation on the 1st of October next.—*Burlington Free Press.*

New York and Erie Road.

The great sale of the 3d class bonds of this road took place on the 12th instant in this city. They were disposed of at rates ranging slightly above 90 cents on the dollar. The largest bidders were Messrs Ward & Co., for \$2,500,000; John Thompson, for \$550,000; Wm. & J. O'Brien, for \$450,000; and Dykers & Alstyne, for \$250,000. The other bids ranged from \$5,000 to \$200,000. The bid of Ward & Co. was \$1,250,000 at 89½, and \$1,250,000 at 90.

The following are the whole amount of the bids, and the rates offered.

\$10,000 at	91-00
10,000	90-87½
15,000	90-75
20,000	90-62½
20,000	90-65
10,000	90-52
15,000	90-50
30,000	90-45
20,000	90-37½
10,000	90-37
20,000	90-35
5,000	90-30
100,000	90-25
30,000	90-15
10,000	90-14
10,000	90-12½
10,000	90-06½
5,000	90-06
310,000	90-05
25,000	90-04
30,000	90-03
95,000	90-02
2,455,000	90-00
100,000	89-87½
500,000	89-75
10,000	89-64
20,000	89-62½
10,000	89-55
1,540,000	89-50
575,000	89a89-25
390,000	88a89-00
120,000	87a88-00
60,000	86a87-00
45,000	85a86-00

6,635,000

All the bids above 90 were successful, amounting to \$810,000, and the remainder of the bonds were divided *pro rata* among the bidders of 90, giving them about two thirds of the amount each bid for.

Pennsylvania.

We learn from the Lancaster, Pa., Gazette that the Safe Harbor Iron Works, located on the Conestoga, are making railroad iron at the rate of 140 rails per day, or 150 tons per week, or 7800 tons per annum. Three steam engines, of the respective capacities of 45, 100 and 125 horse power, are employed in the rolling mill and blast furnace. The number of operatives employed is about five hundred. The cash expenses exceed \$1000 per day.

Georgia.

We copy from the Savannah Republican the following statement of the condition of the Central railroad and Banking company, exhibiting its liabilities, resources, and property, which is published for general information:

LIABILITIES.

To stockholders—for capital stock.....	\$2,851,000 00
" Bill holders—for bank notes circulating	198,450 00
" Bond holders—for 7 per ct. bonds outstanding	272,600 00
" Bond holders—for 8 per ct. bonds outstanding	187 00
" Other banks—for balances due them	34,136 62
" Depositors—for deposits	156,657 26
" Railroad earnings—for collections since December last	409,570 71
" Bank earnings—for discounts & exchanges	16,757 97
" Dividends—for old and unclaimed	17,978 86
" Reserved fund—laid aside 1st December last	71,344 68
	\$4,028,683 10

RESOURCES AND PROPERTY.

By railroad—cost of buildings, depots, and equipment	\$2,850,041 42
" Notes receivable—maturing	84,583 06
" Notes receivable—lying over and in suit—(of which are bad \$1,562-40, and doubtful \$10,017 42)	39,510 99
" Bills of exchange—maturing	98,131 68
" Other banks and agencies—balances due by them	56,075 85
" Stocks in and loans to other companies	271,969 31
" Railroad expenses—repairs, running, &c.	203,197 25
" Bank expenses—salaries, printing, &c.	3,767 84
" Extra expenses—arrest of George J. Bulloch, &c.	7,014 82
" Interest—paid on road bonds	11,910 70
" Protest, &c.—due on unpaid notes	5 07
" George J. Bulloch—abstracted	107,188 55
" Real estate—in Savannah and Macon	18,812 72
" Specie and specie funds—exchange on the north	88,797 89
Specie and notes of other banks	187,675 95
	\$4,028,683 10

Earnings of road since 1st Dec. last, as above	409,570 71
Earnings of bank since 1st Dec. last, as above	16,757 97
Deduct R.R. expenditures	203,197 25
Bank expenses	3,767 84
Extra do.	7,014 82
Interest on roads	11,910 70
	225,890 61
Net earnings	\$200,438 07
Dividend declared this day \$4 per share	114,040 00
Balance carried to reserved fund	86,398 07
Reserved fund at last settlement, as above	71,344 68

June 4th, 1850.

\$157,742 75

Tennessee.

Nashville and Chattanooga Railroad.—We learn from the Chattanooga Advertiser that the contract for building the section of the Nashville and Chattanooga railroad between Chattanooga and the Tennessee river, on the eastern bank, a distance of twenty-seven miles, also the masonry for the bridge across the river has been taken by John M. Burk, of Pennsylvania. We believe the whole road is now under contract and this last section is to be completed in twenty months. The friends of this

improvement are pushing it ahead with commendable zeal.

Massachusetts.

Midland Railroad.—The efforts now making to carry out this project, seem to be in a fair way of success. The unfinished portions of the road from Hartford to Boston, are thirty miles from the eastern terminus of the Hartford and Willimantic road to the State line, and fifteen miles from that point to Blackstone, the western terminus of the Norfolk County road, making forty-five miles in all. The city of Hartford, some weeks since, petitioned the Connecticut legislature for leave to lend its credit for half a million of dollars, towards the furtherance of this object, and the committee have reported favorably. If the bill should pass the legislature and be accepted by two-thirds of the legal voters of Hartford city, it will become a law. It is thought that a favorable arrangement will then be made with the landholders and shareholders of the Norfolk County road with a view to merge the whole in one corporation. Nothing has as yet transpired as to the progress made towards getting the stock taken for that portion of the line which extends from South Dedham to Sea street in this city, the charter for which was granted at the last session of our legislature. About 150 shares of Norfolk County railroad stock were sold yesterday at the first and second boards at from \$30½ to \$30¾ and subsequently in the afternoon about 200 shares at from \$31 to \$31½ per share. Within a year this stock has been as low as \$17—and as high as \$40.—*Boston Cour.*

Railroads between Atlanta and Montgomery.

We learn from the report to the stockholders of the Montgomery and West Point railroad company, that this road is expected to be finished and opened for use to West Point, as early as next October. The road, as far as completed from Montgomery, is now in a highly prosperous condition, paying very good dividends. The receipts for the year ending March 1st, 1850, amounted to about 121,000 dollars.

The Atlanta and LaGrange railroad, which is now progressing rapidly, under the energetic management of those having it in hand, will probably be opened as far as ten miles beyond Newnan, in Boweta Co., by next April. Hence, after that time, through passengers from Charleston to Montgomery, will only be subjected to about thirty-six miles of staging, and the trip will be accomplished in about 36 hours. Present prospects of the roads now being built, warrant the conclusion that by the first of April, 1852, at farthest, the entire line of railroad communication between New York and Montgomery will be perfected, reducing the travelling time between the two points to about four days.

Effects of the Free Trade Policy.

The Clinton Whig, published in Clinton county New York, states that of forty-one forge fires on the Saranac river, in 1848, twenty-one had been put out previous to the first of January last, and since that time fourteen of the remaining twenty have also been extinguished—leaving but six of the forty in operation! The Whig adds:

"By the necessary suspension of business, more than five hundred men have been thrown out of work, and over 2000 women and children, dependent upon them for bread, are deprived of the comforts which they have heretofore enjoyed! In addition to these eight of the eighteen fires on the Salmon river have been put out, and others will follow. So on the

Ausable. Of the fifty-four there, probably not a dozen will be kept up through the summer.

"At these three points alone, over fifteen hundred men, heretofore earning from \$1 to \$2 per day, will be thrown out of work—and the \$2000 a day which they have been earning, will go, practically, into the pockets of the iron workers of Great Britain."

AMERICAN RAILROAD JOURNAL.

Saturday, June 15, 1850.

Balance of Trade.

Influence of the Exportation of Specie on Production and National Wealth.

The idea, which was regarded as a fundamental principle by the early school of political economists, that the measure of a nation's wealth was the am't of precious metals it possessed, and that trade was favorable or unfavorable just in proportion as it increased or diminished this amount, is now referred to only as proof of the crude notions which then prevailed upon this subject, and excites a smile that such an absurdity could so long have exerted a controlling influence over the public mind.

This, though a very absurd idea, was a very natural mistake for people to fall into. In the early discussion of any subject, we are apt to mistake phenomena for causes, and the apparent for the real. It was in this way that gold and silver came to be regarded as the only articles to which the term *wealth* could be applied. In all times and among all people have the precious metals been objects of more universal desire than any other articles of property. As a general rule, men are always found willing to part with whatever they can spare for gold and silver, from the value which they possess in their eyes, either for ornament or use. The possessor of them was always certain of being able to supply any of his wants and obtain any other article of property in exchange for these.

This quality of exchangeability possessed by gold and silver to a much greater extent than any other values, naturally led people to the idea that the value of gold and silver was different in *kind* from all others. This mistake was further encouraged by the fact that all contracts were made payable in them, and that the possession of them was the end and object of trade and commerce of every kind.

Experience has long since exploded all such notions as these. Whatever can support labor and become the basis of production—whatever can administer to our wants and luxuries—is, in modern ideas *wealth*; and the nation which is the best off in these respects is justly regarded the richest. Money is neither food nor clothing, and the only use of it is to obtain something which we can eat, drink, or wear—something that adds to comfort; and the person who has purchased such articles, and exchanged for them his gold and silver, is just as rich after the exchange as he was before it took place.

Notwithstanding all this, we still find it to be the fact in the commercial world, that the nation which possesses most of the precious metals, wields by virtue of them a very powerful influence, prejudicial to the interests of all other members of the commercial confederacy. We find in the United States that the moment we begin to ship gold and silver to England, we feel the evil effects of it in commercial embarrassments. Money becomes scarce just in proportion to the extent of the shipment; the value of all kinds of merchandise and property falls, and if the exportation is continued to a great extent, as in 1836-7, a commercial

crisis and general insolvency is the result. The depreciation of property exceeds in value many times the amount of the specie shipped. If on the other hand an equal value in produce should be exported and its return received in gold and silver, the consequence would be an universal appreciation of prices and general commercial prosperity. Now if gold and silver, as a part of national wealth, are not distinguishable from wheat or cotton in any of their characteristics as property, why should their exportation of it be attended with such different results? We will endeavor to explain the apparent anomaly.

As we stated in the outset, gold and silver are objects of universal desire, and enable the possessor of them to obtain with them whatever he may wish. This characteristic which they have over all other kinds of property naturally leads every person to desire to possess as much as possible; or in other words to convert into them all surplus of other kinds of property. All contracts for the same reason were made payable in them, and the value of every article of merchandise came to be measured by the amount of gold and silver it would command.

This is the leading cause which led to the adoption of the precious metals as a medium of exchange. It is based, not upon the caprice, nor upon the conventional agreements of mankind, but upon a law of our nature. Gold and silver possess other characteristics which peculiarly fit them for this purpose, such as the amount and regularity of supply, and the capacity they possess for extreme divisibility without impairing their value; but these are subordinate, and not the leading reasons for their adoption as money.

But though gold and silver are valuable in themselves, and make up a part of the aggregate of national wealth, they are, in one point of view, so much dead capital when employed as money. They are neither food for, nor are they instruments in the hands of labor. In themselves they do not aid in the office of reproduction. They are useful only as agents to facilitate the exchange of articles of use or consumption; and could this exchange be effected without this agency, the amount now used as money might be withdrawn from its present office, and be made the basis of further production. This fact has led to the dispensing with as large an amount as possible from their employment as money, so that we find, that though all contracts are stipulated to be paid in gold and silver, not one in ten thousand are discharged in them. Nearly the whole machinery of commerce is carried on without their actual intervention, by the use of a credit of which they form the basis, while they are seldom removed from the vaults where they are placed for safe keeping.

Were every contract in life necessarily paid in gold and silver, the result would be two fold: the value of them would rise to an exorbitant degree, and business transactions would be curtailed to an equal extent. It would increase the cost of all kinds of merchandise, and diminish the ability of all to purchase. It would reduce production to a mere fraction of what we now witness, and exert a corresponding influence upon the present condition of society, for reasons which are perfectly simple and plain.

Economy of production has led to an almost infinite subdivision of labor; so that the most common article of use passes through many hands in the process of its construction. Some, apparently the most simple, are the joint product of many hundred workmen; it being found that a minute divis-

ion of labor secures a much greater amount of production, and a much more perfect article. The greater part of persons employed in manufacturing have no interest in the article upon which they may be employed; neither does their labor give it a marketable value, till it goes through the hands of the last person in the process. It is the aggregate labor of all that fits it for the market. The great body of workmen employed have no exchangeable value to offer. What they had done or added to any particular article has no marketable value detached from the article itself. They cannot directly exchange the result of their labor for what they must have for their support. They therefore must be paid in *money*, which they can exchange for whatever they may stand in need of.

If there were no such thing as money, and all exchange of products were effected by an "exchange in kind," this would to a very great extent put an end to division of labor, because each person would be compelled to confine himself to the production of exchangeable values: that is, to the *complete* production of one article. If he were a manufacturer of cloth, he would be compelled to perform every step in the process, because no one would buy the article half finished. We should thus lose all we have gained by division of labor. But the evil would by no means end here. The manufacturer, after he had fitted his article for the market, would be obliged to go in pursuit of a customer; and before the right person could be found, the maker would probably lose in time and expense, much more than the cost of production.—Without any further illustration of this part of the subject, it is perfectly easy to see that without money society could have made but little progress, and its disuse would at once reduce us to a semi-civilized state.

We have above spoken of the use of money in the ordinary affairs of life with which we are all conversant. The same views apply with an equal force to foreign as to domestic commerce.

Gold and silver, when used as money, being so much dead property, it for our interest to use only the smallest possible amount of such; and we find that a greater part of the transfers of property are effected without their actual intervention. The exchanges for the most part are effected by the use of credits. Take as a familiar illustration the case of a New England cotton manufacturer. After his fabrics leave his hands, they pass through those of perhaps ten persons before they reach the consumer. He first sends them to his agent in Boston.—He forwards them to a commission house in New York. The New York merchant sells to some Western trader, who in turn sells to another, and so they pass from hand to hand, till they reach the consumer. Now if every person connected with the transfer was obliged to pay the value of the goods to the person who preceded him in it, this fact would require the use of a capital in gold and silver ten times greater than the value of the goods. Each person would be compelled to charge not only for his own labor but a fair compensation for the use of his money. And this additional charge would be so much reduced from the profits of the manufacturer. To save this additional expense, he sells on such time as will allow the goods to reach the consumer, and the pay to come back through the same channel through which they were forwarded; and the only money used in the transaction is that paid by the last purchaser. The manufacturer is thus enabled to receive the full value of his goods, less only the cost of forwarding

to the consumer; and provided only that trusty agents are employed, he makes a much larger profit than he could have made were every transfer effected by the use of money. Experience has proved that in the long run more is saved by giving credits than by selling for cash; and it is upon the reasons here laid down, that credits in mercantile transactions are based. The abolition of credits would to a great extent check the transfer of merchandise, and consequently stop production just in proportion to the additional amount of property that would be required to be changed from a productive to an unproductive state.

But we find that the system of credits is extended still further than in the case cited for illustration; so that the use of gold and silver is dispensed with even in the payments by the consumer, who pays in paper money, which is in itself a credit. Without here going into the history of banks, or the causes which have built up the present system, we find that in the affairs of business the money used has no intrinsic and substantial value. It represents, it is said, *money*, but this is admitted to a certain extent to be a fiction. It is received as money from the credit attached to those who issue it; because it is known that if they have not the specie the bills represent, they have something that will procure it; and that if they do not represent gold and silver, they are based upon substantial values—something that can be exchanged for them. This form of credit enables a community to withdraw an additional amount of the precious metals from its unproductive state as money, equal to the excess of the issue of bills over the amount of specie upon which this issue is based.

In this point of view banking credit adds directly to national wealth, as it enables us to avail ourselves for production of an equal amount of property, which without such would be required for currency. Banking institutions are therefore of equal advantage to all classes, though they seem to be for the exclusive benefit of the rich—as they diminish the rate of interest, facilitate the transfer of property, diminish the cost of products to the consumer, and turn a large amount of property to productive uses.

In popular ideas, bank bills are based upon specie. Though such is not absolutely the fact, yet they never would be received as money unless it was believed that they could be converted into gold and silver at an instant's notice. But as general experience proves that there is no probability that all the bill-holders will present them for redemption at the same time, it is considered a safe rule to issue bills to four or five times the amount of the specie held by the bank. So long as a bank continues in good credit, and possesses convertible property enough to eventually redeem its circulation, the bills are seldom presented for payment.—Money in the shape of bank bills is in a much more convenient form than in the precious metals, and consequently they are preferred to the latter so long as they can be used with safety.

We thus enumerated the causes that have led to the use of paper money, and built up the present banking system of the country. The system has been developed and matured by long experience, and we have a right to suppose that it is the one best adapted to the wants of the mercantile and business community, just as ships and railways are adapted to the office they are to perform. One is just as necessary as the other. Each profession is to be trusted in its calling, and the rules and regulations by which each are guided and controlled, are entitled to respect from all others.

From the premises which we have laid down, it is very easy to draw the conclusion, at which we are aiming. So long as the exchanges of property are effected by credits, as is at present the case, it is very easy to see that the exportation of \$1,000,000 in specie necessarily contracts the circulation of paper five times that amount. Money in consequence becomes scarce, and a greater amount of property than formerly is required to be converted into money to pay a debt contracted before such export. If ten millions are exported, fifty millions of paper money must be withdrawn from circulation. In case of such large exportation, the price of money is so increased, that property which was once ample to pay the debts of a merchant becomes insufficient, and he must fail.—What is true of the individual, is true of the whole community.

In regulating the tariff, therefore, we should be mainly governed by its influence upon the specie of our country. Any system of trade or finance which draws steadily upon our precious metals is a false one, as it must be hostile to all our best interests. The best good of the country is promoted by maintaining in it an uniform amount. Any arrangement of a tariff that will allow such an influx of goods as to withdraw a large amount of it in use, is faulty in the extreme, and should be remedied. We look upon a tariff as more important as a question of finance than protection. The first should always control the last. So long as the balance of trade is in our favor we need no further protection, and we do need it so far as it is necessary to keep it so. If the former is right the latter must be, as the greater must always include the less.

Such we believe to correct views in relation to a tariff. It is simply a question of principle, in which all parts of the country are equally interested, and one in which neither personal nor sectional feeling should have any influence, the South, the North and the West are equally interested in the same rate of duties, established upon the principles we have laid down.

Vermont.

The Boston Post says that "the Vermont and Canada Railroad has just concluded a transaction which must benefit the whole chain of roads, the Ogdensburg, Central, and Vermont and Canada. This latter stock, it will be remembered, is guaranteed by the Central to pay 8 per cent. per annum for fifty years. It was first offered to the subscribers of the Central, but only a small portion was taken. A company of gentlemen of this city have now subscribed \$500,000 of the stock, secured, as we understand, by a mortgage of the road, in addition to the Central guaranty. This amount, with the assistance which will probably be received from the Northern and Concord roads, will secure the immediate completion of the Vermont and Canada, pay for the road, and free the Central from a heavy burden on its finances."

Banking in Connecticut.

The Legislature of Connecticut has under consideration a general banking law. According to its provisions, the securities to be deposited (at their par value) with the State Treasurer, are stocks of the United States, the States of New York, Massachusetts, Ohio, the cities of New York and Boston, and any incorporated city in Connecticut.—The treasurer and school fund commissioners constitute a board of control, who are authorized and required to meet once a month to examine the securities deposited. If, in their opinion, there are not sufficient to protect the circulation, then it is their duty to require additional security forthwith, and

if it is not furnished within ten days, then the Superior Court appoints a receiver, who immediately winds up the affairs. Stockholders are individually liable for the indebtedness of the bank.

Railroads from the Mississippi Valley to the Seaboard.

Some of the Results thereof now Evincing, but heretofore unlooked for.

When the cities on the seaboard first commenced their respective lines of artificial communication with "the great west," it was supposed that these lines would (at least for a long series of years) be chiefly required to bring to us the surplus agricultural staples of that west, and to take back in exchange the fabrics of iron, wool, cotton and even wood; that the profits of making these exchanges would always enure to our benefit, and would increase our population, add to the value of our land, and secure to us the controlling influence in matters of finance, commerce, and the general policy of the government. Very few then dreamed of ever hearing of a nail factory at Pittsburgh, or machine shop at Cincinnati, or cotton mill in Indiana, or a sugar refinery in St. Louis. Had any one then predicted that Georgia osnaburgs would be sold in New York within this century he would have been regarded as a fool or a madman.

Temporarily, each line referred to has, to a great extent, effected the objects in view. Baltimore has been doubly repaid for her expenditure in the railroad to Cumberland by the advance on her real estate. Philadelphia has increased with astounding rapidity, from making herself the terminus of roads and canals into and through the Alleghanies. New York has retained her relative importance, by her magnificent works that connect her with the great lakes. Boston has extended her boundaries far beyond her peninsula by throwing her "grappling irons" over every important water fall in New England, and by connecting the grain fields of the west with the markets of her tributary manufacturing towns. Perhaps these cities have all made a wise expenditure. But new elements are now unexpectedly arising, and are beginning to exert a force of which we can, as yet, hardly understand the strength.

These roads and canals have connected and made us familiar with a vast country of lands and minerals and products richer than our own. They have facilitated the movements of emigrants thro' our country, to that which holds out greater attractions. They have been the means of transporting the arts and sciences, and conveniences and luxuries; in short, all the means of social comfort and high enjoyment to pursuits where, but a few years ago, the Indian roamed in solitude. They have shortened the agricultural age of the Ohio valley to a period measured by tens instead of hundreds of years. They are now bringing us the products of Pittsburgh Wheeling, and Cincinnati workshops. St. Louis offers an extended sphere of operations to our merchants and bankers; Nashville bids highest for our professors, and Louisville is in the market for our preachers. Ohio, Indiana and Illinois have added good schools, commenced churches, and good roads to the schedule of their attractions to our people who have preferred sandy and rocky farms to fertile and cheap lands in a wilderness.

The result of all this is evident—inevitable. Our spinners and weavers will now go where cotton and wool and food are cheapest. Our furnaces must be closed if those on the Tennessee river can get iron ore at one-third its cost to us. Our

farmers will not hold lands at \$100 per acre when they can buy lands on the Wabash of a better quality, and as near to a school house as their own, for \$5 an acre. Had it not been for these roads, the valley of the Wabash would still be to us a "terra incognita." But the roads will produce an equilibrium, and, as the western valley is so extensive, must not our lands, at least those not in the immediate vicinity of cities, fall to the common level? Here are problems of which time is rapidly affording solutions, and the statistics of our census of 1850 will furnish data from which the statesman and man of business may read many a lesson not embraced in his present course of study.

In a recent lecture before an association at Cincinnati, published and endorsed by Judge Burnet and three leading men of that city, the writer, Mr. Tapt, has referred to Jappa and Jerusalem, Havre and Paris as indicative of the future relative position and importance of our cities on the seaboard to a city or cities in the interior. This looks to be and perhaps is a rich specimen of *extravagance*. But the growth of these interior departments may warrant expectations of the most brilliant hue in the minds of those who are a part of that growth.

We look at the increase of the population and wealth and the diversity of pursuits in that valley as the certain causes of the continued growth of our seaboard cities, and especially of New York. Suppose that the peaceful and untaxed west, rich in minerals, food and fibrous staples, should produce fabrics of iron, wool and cotton cheaper than England or any other country. The tide of business would still run by us. We should still be the central point of exchange, the great mart of commerce. We should be to the manufacturers over the mountains what Liverpool and London are to the manufacturing districts of England.

The next generation may see this change. The natural elements of our progress are vastly more powerful than those on which have rested the manufacturing supremacy of Great Britain. Skill and capital are of easy acquirement, and the natural must, sooner or later, overcome the artificial.

Patent Self-clinching Railroad Spikes.



These spikes have been in use upon various roads for several years, and have met with universal approval by Engineers. They drive in the manner shown, turning themselves, and are therefore not liable to work loose. They will prove of great value to secure the chair.

We are also manufacturing railroad spikes, hook and flat head; wrought chairs, clamps, etc., of superior quality, and are prepared to contract for any pattern or weight upon favorable terms.

SMITH & TYSON,
25 South Charles st., Baltimore Md.

Stickney & Beatty, DEALERS IN IRON AND IRON MANUFACTURERS.

AGENTS for the Balt. City Rolling Mill, from which establishment they are prepared to furnish Ellicott's round, square, and flat bar iron, puddled and charcoal boiler plates and billet iron—also agents for the sale of the Laurel and Maryland (Balt.) charcoal forge pig irons, Balt. hard iron for chilling wheels, anti-Eatam nails, Catoctin foundry iron, boiler blooms from the Caledonian works, Wm. Jessop & Son's cast steel, Coleman's blister steel and nail rods, hoop, band, sheet, oval and common English iron.

Nos. 18 and 20 South Charles st., Baltimore.

Ray's Patent India Rubber Car Springs.

Connecticut River Railroad Office,
Northampton, May 4, 1850.

E. CRANE, Esq.,

Dear Sir: It is now about two years since I first tried the experiment of using a set of Ray's India-rubber Springs upon one of our merchandise cars, and although the car has been in constant service since that time, I do not on examination find the slightest difference either in the thickness or elasticity of the material.

The same result has followed wherever we have applied them, either for wheel or draw springs on Engines, Tenders or Cars. At present we use no other; either in replacing old springs or building new cars—and I am perfectly satisfied that for economy, durability, safety, and ease of motion, that Ray's India-rubber is the best article for Springs which has been presented to the public.

Yours respectfully, J. HUNT,
Supt. Connecticut River Railroad.

EDWARD CRANE, Esq.,

Dear Sir: Having applied to cars of the Boston and Worcester Railroad Corporation, Ray's Vulcanized Rubber Springs (where they have been in use for some two years last past), I have had occasion to observe their operation, and am free to say in answer to your inquiries, that they retain their elasticity perfectly during all changes of atmospheric temperature: and are in my opinion a most valuable acquisition to Railroad Cars—were not liable to derangement, as is the case with steel springs; while at the same time it costs less to apply them. Respectfully yours,

D. N. PICKERING,
Supt. Motive Power, Bost. & Wor. Railroad.
Boston, April 15th, 1850.

Notice to Contractors.

PROPOSALS will be received by the Subscribers at Portland, until the 21st instant, for the Grading and Masonry of that portion of the Atlantic and St. Lawrence Railroad, lying between Bethel Village, in the State of Maine, and the Town of Gorham, in New Hampshire—a distance about 25 miles.

Plans and profiles will be in readiness for examination after the 15th inst., at the Engineer's office in Bethel—or at the office of the Subscribers, in Portland.

Contractors of experience, and means, will find this notice worthy their attention—as the line embraces much heavy work, and the character of the earth and rock being of the most desirable description.

Spirituuous Liquors will not be allowed on or about the work—nor will the proposals of Contractors be considered, who have heretofore failed to pay the Laborers employed by them on this or any other public work.

Cash payments will be made monthly, reserving 10 per cent. until the final completion of the contract.

WOOD, BLACK & CO.
Portland, June 10, 1850.

NOTICE.

A young man of experience in Surveying wishes a situation on a Railroad as an Assistant. Please apply at this office.

NORRIS' LOCOMOTIVE WORKS, SCHENECTADY, N. Y.

THESE Works are in full operation in Manufacturing to order, Locomotive Steam Engines & Tenders, of the best principle and construction of material, using wrought iron heavy frames with pedestals welded thereto, and all parts of the engine made of the best wrought iron, except cylinders, pumps and boxes—obtaining greater durability, and carrying less weight over the road, than engines constructed of cast iron.

Wrought Iron Tires made any required size, and Tire Bars bent and welded with dispatch.

Chilled Wheels for Cars, Trucks and Tenders, made from the toughest iron.

Driving and Tender and Car-Wheels fitted to Axles with Brass Boxes and Springs, and Railroad Machinery generally. Manufactured and for sale by
April 11, 1849. E. S. NORRIS.

Theodolite for Sale.

A FIRST RATE 5 INCH THEODOLITE for sale at a bargain. Enquire at the Railroad Journal Office. 2w22*

Election of an Engineer.

At a Meeting of the Board of Directors of the Virginia Central Railroad Co. at Charlottesville on the 4th day of June, 1850,

Resolved, That the election of a Chief Engineer in the place of Wm. A. Kuper, whose resignation has been accepted, is postponed to take place in Richmond on Tuesday the 18th of June instant.

A copy from the minutes.

JOHN GARRET, Secretary.

Lovegrove's Patent Cast Iron Water and Gas Pipes.

THE Subscriber, the Inventor and Patentee of the Centrifugal mode of giving form to metallic substances while in a molten state, is preparing to make Cast Iron Water and Gas Pipes, of any dimensions, at prices much lower than they can be made in the old manner, and the pipes warranted to stand a pressure of three hundred pounds to the square inch, and to be soft enough to drill. Steam Engines and all kinds of machinery. Cast Iron Doors and Frames, and Mill Castings of every description, made to order.

THOMAS LOVEGROVE,

Machinist and Founder,

West Falls Avenue, below Pratt st., Baltimore.

American Railway Guide, AND POCKET COMPANION FOR THE UNITED STATES;

CONTAINING Correct Tables, showing the time for starting of trains from all stations, distances, fares, etc., on all the Railway lines in the U. States; also many of the principal Steamboat and Stage routes—accompanied by a complete RAILWAY MAP. Price, single copies 12½ cts., or \$1 per annum. Published on the first of every month, corrected from returns furnished by the Railway Superintendents throughout the Union.

This book has been compiled somewhat on the plan of Bradshaw's Guide, with such improvements in size, form and arrangement as have seemed desirable; and the publisher confidently hopes it will not be found liable to the objections of incompleteness and incorrectness, which have been made, and justly too, against various other similar works heretofore issued.

The subscriber having had the management of the NEW YORK PATHFINDER almost from its commencement, has enjoyed superior facilities in obtaining information relating to the thoroughfares of travel, and is therefore well qualified to prosecute with success the arduous undertaking of furnishing a complete and correct national guide book.

STRINGER & TOWNSEND, General Agents, 222 Broadway: and sold also by Booksellers and Periodical Dealers generally throughout the country; also on all the Railways and Steamboats.

CURRAN DINSMORE, Publisher.

N. Y. Pathfinder Office,
138 Fulton St., New York City.

India-rubber for Railroad Cos.

RUBBER SPRINGS—Bearing and Buffer—Fuller's Patent—Hose from 1 to 12 inches diameter. Suction Hose. Steam Packing—from 1-16 to 2 in. thick. Rubber and Gutta Percha Bands. These articles are all warranted to give satisfaction, made under Tyer & Helm's patent, issued January, 1849.—No lead used in the composition. Will stand much higher heat than that called "Goodyear's," and is in all respects better than any in use. Proprietors of railroads do not be overcharged by pretenders.

HORACE H. DAY,

Warehouse 23 Courtlandt street.

New York, May 21, 1849.

To Railroad Companies.

FOR SALE—A Second-hand Locomotive Engine and Tender, of about 10 tons weight, in good order, and warranted to perform well. Any company wanting a cheap engine for a passenger or light burden train, will rarely meet with an opportunity so favorable as the present. The engine and tender are in perfect running order, and will be tested to the satisfaction of any one wishing to purchase. Price \$1,500.

Address

J. B. MOORHEAD,

Frazer P.O., Chester county, Pa.

P.S.—The Engine can be seen by calling on H. Osmond & Co., Car-builders, Broad st., Philadelphia. September 6, 1849.

Spikes, Spikes, Spikes.

ANY person wishing a simple and effective Spike Machine, or a number of them, may be supplied by addressing J. W. FLACK, Troy, N. Y. March 6, 1850.

Great American Engineering

AND MECHANICAL WORK, just published in medium folio, 75 cts. to Subscribers, One Dollar to non-subscribers.

Part V of "Specimens of the Stone, Iron and Timber Bridges, Viaducts, Tunnels, &c. &c. of the United States Railroads." By George Duggan, Architect and Civil Engineer.

The present part contains beautifully executed plans, elevations and sections of the Timber Viaduct across the Canewacta Creek at Lanesboro', Pa., and the Details of the Starucca, (stone) Viaduct near Lanesboro', Pa., on the line of the N. Y. & Erie R. R., with the specifications, estimates, etc.

N.B.—This work is published by subscription of the most eminent in the engineering profession of the U. States, and will be completed in 12 parts, at 75 cents each to those who remit their names and subscriptions before the 1st June next—when the first 6 parts or one half of the work will be published—after which the price will be raised to \$1 per part.

To those making a present remittance of \$5, and the remainder \$4, when they have been supplied with the first six parts, the work will be forwarded regularly as published. Parties remitting \$9 shall receive it monthly post-free in any part of the United States.

"It is a work that was a great desideratum, and must prove of great benefit to the engineering profession generally, and especially to the tyro in practical engineering and mechanical knowledge; in truth it strikes us, that it would require years of labor and patient toil on the part of a young engineer to prepare the drawings, and collect the information that will be embodied in this work, and can now be secured for the trifling sum of \$9."—[Scientific Amer. March 16, 1850.]

In connection with this subject (Iron Railroad Structures) we take occasion to call attention again to Mr. Duggan's valuable and expensive publication, exhibiting drawings, with full descriptions of the various stone, iron and wooden bridges, viaducts, tunnels, culverts, etc., of all the Railroads in the United States. Mr. Duggan is an accomplished Architect and Civil Engineer, who came from Ireland to this country to exercise his profession; but finding railroad construction here, in many respects, different from that he had been accustomed to in Europe, he applied himself to the study of our system; and the fruits of his researches and investigations embodied in this work, are well calculated to meet the exigencies of engineers, and to assist draughtsmen, bridge builders, mechanics and students. [N. Y. Journal of Commerce, Feb. 14, 1850.]

Published by **GEORGE DUGGAN**,
300 Broadway, New York.
To whom all communications should be addressed,
and subscriptions forwarded.

Doremus & Nixon,
IMPORTERS AND FURNISHERS

RAILROAD CAR AND COACH TRIMMINGS.

Plain Garnet Plush. Fig. Garnet Plush (Butterfly pat.
"Crimson" "Crimson" "Elegant."
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BROCATELLES.

Crimson Silk Brocatelles. Gold and Maroon do.
Gold and Blue " Brown "
Silk and Wool " of every color.

MOQUETTES,

Of elegant designs and colors.

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The most beautiful goods ever shown in this country, and the subscribers are the sole agents for the sale of them.

Oil cloths Enamelled with Gold. These goods can be
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Do. Silver ground velvet printed. dimensions req'd.

CURLED HAIR

Of every description and quality.
JNO. W. A. STRICKLAND, Agent.
New York, 1850. 1y16

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CELEBRATED CAST STEEL**

AND
Best Cast Steel Royal Improved Files, well known as better adapted for Engineers' and Machinists' purposes than any now in use in the United States.

Every description of Square, Octagon, Flat and Round Cast Steel, Sheet, Shovel and Railway Spring Steel, etc., and Steel to order for any purposes—manufactured at their works in Sheffield—and universally known by the old stamp "Globe."

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Fire Brick.

THE Subscribers have constantly on hand Rafford's Stourbridge, Oak Farms Stourbridge, Lister, Wortley, Red and White Welsh Fire Bricks, common and fancy shapes. Also,

ROOFING SLATES,

from the best Welch quarries, and of all sizes. Also,

COAL,

of all kinds—Liverpool Orrell and Cannel, Scotch, New Castle, Pictou, Sidney, Cumberland, Virginia, and all kinds of Anthracite coals. Also,

Pig Iron, Salt, etc., etc., for sale at the lowest market price. Apply to

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275 Pearl and 43 Gold Sts., New York.
November, 23, 1849.

FAIRBANKS' RAILROAD SCALES.—THE subscribers are prepared to construct at short notice, *Railroad and Depot Scales*, of any desired length and capacity. Their long experience as manufacturers—their improvements in the construction of the various modifications, having reference to strength, durability, retention of adjustment, accuracy of weight and dispatch in weighing—and the long and severe tests to which their scales have been subjected—combine to ensure for these scales the universal confidence of the public.

No other scales are so extensively used upon railroads, either in the United States or Great Britain;—and the managers refer with confidence to the following in the United States.

Eastern Railroad.	Boston & Maine Railroad.
Providence Railroad.	Providence and Wor. Road.
Western Railroad.	Concord Railroad.
Old Colony Railroad.	Fitchburg Railroad.
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Balt. and Ohio Railroad.	Baltimore and Susq. Road.
Phila. & Reading Road.	Schuylkill Valley Road.
Central (Ga.) Railroad.	Macon and Western Road.
	New York and Erie Railroad.

And other principal Railroads in the Western, Middle and Southern States.

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Agents, } FAIRBANKS & Co., 89 Water St., N. York.
 } A. B. NORRIS, 196 Market St. Philadelphia.
April 22, 1849. 1y*17

**STABILITY—SECURITY—PERPETUITY.
Mutual Life Insurance Co. of
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A MILLION OF DOLLARS**

Securely invested in Bonds and Mortgages on real estate in this city and Brooklyn, and stocks of the State and City of New York and United States Government.

The company declared a dividend of profits of fifty-two per cent. on all existing policies on the 31st of January, 1848.

All the Profits are Divided Among the Insured.
Persons may effect insurance on their own lives and the lives of others.

A married woman can insure the life of her husband, the benefits of which are secured by law for the exclusive use of herself or children.

Clergymen and all others dependent upon salaries or their daily earnings are specially invited to avail themselves of a resource whereby their surviving families may be secured from the evils of penury.

Pamphlets explanatory of the principles of Mutual Life Insurance, and illustrating its advantages, with forms of application, may be obtained at the office of the company, 35 Wall street, or of any of its agents.

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Jos. B. Collins,	David C. Colden,
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Alfred Pell,	John C. Thatcher.

JOSEPH B. COLLINS, President.
ISAAC ABBATT, Secretary. 3m9

NOTICE TO**Superintendents of Railroads.**

TYLER'S PATENT SAFETY SWITCH.—The undersigned would respectfully call their attention to his Patent Safety Switch, which from long trial and late severe tests has proved itself perfectly reliable for the purpose for which it was intended. It is designed to prevent the train from running off when the switch is set to the wrong track by design or accident. The single rail or gate switch is established as the best and safest switch for the ordinary purpose of shifting cars from one track to another, but it is liable to the serious evil of having one track open or broken when connected with the other. My improvement entirely removes this evil, and while it accomplishes this important office, leaves the switch in its original simplicity and perfection of a plain unbroken rail, connecting one track with the other ready for use.

The following decision of the Commissioner of Patents is respectfully submitted to Railroad Engineers, Superintendents, and all others interested in the subject.

P. B. TYLER.

(COPY.)

UNITED STATES PATENT OFFICE,
Washington City, D.C., April 28th, 1846.

SIR: You are hereby informed that in the case of the interference between your claims and those of Gustavus A. Nicolls, for improvements in safety switches—upon which a hearing was appointed to take place on the 3d Monday in March, 1846, the question of priority of invention has been decided in your favor. Inclosed is a copy of the decision. The testimony in the case is now open to the inspection of those concerned.

Yours respectfully, **EDMUND BURKE**,
Commissioner of Patents.

To Philos B. Tyler.

Any further information may be obtained by addressing P. B. TYLER, Springfield, Mass., or JOHN PENOLETON, Agent, 149 Hudson St., New York.

Coal.

CUMBERLAND SEMI-BITUMINOUS COAL

superior quality for Locomotives, for sale by
H. B. TEBBETTS,
No. 40 Wall St., New York. 1m19
May 12, 1849.

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CORNER SCHUYLKILL 2D AND HAMILTON STS.,
SPRING GARDEN, PHILADELPHIA CO., PA.

Kimball & Gorton,

Having recently constructed the above works, are prepared to construct at short notice all kinds of

RAILROAD CARS, Viz:

Passenger Cars of all classes—Open and Covered Freight and Express Cars—Coal Cars—Hand Cars & Trucks of all descriptions.

They are also prepared to furnish Chilled Wheels of any pattern. Car Wheels & Axles fitted and furnished. Snow Ploughs and Tenders made to order. Steel and other Springs always on hand.

All orders will be filled at short notice, and upon as good terms as at any other establishment in the country.

Omnibuses from the Exchange run within one square of the manufactory every 10 minutes during the day.
Philadelphia, June 16, 1849. 1y25

C. W. Bentley & Co.,

IRON Founders, Portable Steam Engine Builders and Boiler Makers, Corner Front and Plowman Sts., near Baltimore St. Bridge.

BALTIMORE, MARYLAND.

Their Engines are simple in their construction, compact and durable; they require no brick work in setting them, and occupying but a small space (a six horse power engine and boiler, standing on a cast iron plate of three by six feet.)

They also manufacture Major W. P. Williamson's new oscillating Engine; a superior article, combining cheapness and simplicity (one of which may be seen in operation at their shop.) Both of these engines are adapted to any purpose; where power is required, and may be made of any capacity; and for economy in use of fuel are unsurpassed.

All kinds of machinery made to order. Steam Generators, Force Pumps, Wrought Iron Pipes and Fittings for Steam, Water, Gas, etc., constantly on hand,
Baltimore, June 6, 1849.

CORROSIVE SUBLIMATE.

THIS article now extensively used for the preservation of timber, is manufactured and for sale by **POWERS & WEIGHTMAN**, manufacturing Chemists, Philadelphia.
Jan. 20, 1849.

ENGINEERS.**Atkinson, T. C.,**

Alexandria and Orange Railroad, Alexandria, Va.

Bancks, C. W.,

Civil Engineer, Vicksburg, Miss.

Berrien, John M.,

Michigan Central Railroad, Marshall, Mich.

Buckland, George,

Troy and Greenbush Railroad.

Clement, Wm. H.,

Little Miami Railroad, Cincinnati, Ohio.

Cozzens, W. H.,

Engineer and Surveyor, St. Louis, Mo.

Alfred W. Craven,

Chief Engineer Croton Aqueduct, New York.

Davidson, M. O.,

Eckhart Mines, Alleghany Co., Maryland.

Fisk, Charles B.,

Cumberland and Ohio Canal, Washington, D. C.

Felton, S. M.,

Fitchburgh Railroad, Boston, Mass.

Floyd-Jones, Charles,

South Oyster Bay, L. I.

Gzowski, Mr.,

St. Lawrence & Atlantic Railroad, Montreal, Canada.

Gilbert, Wm. B.,

Rutland and Burlington Railroad, Rutland, Vt.

Grant, James H.,

Nashville and Chattanooga R. R., Nashville, Tenn.

S. W. Hill,

Mining Engineer and Surveyor, Eagle River, Lake Superior.

Holcomb, F. P.,

Southwestern Railroad, Macon, Ga.

Johnson, Edwin F.,

New York and Boston Railroad, Middletown Ct.

Latrobe, B. H.,

Baltimore and Ohio Railroad, Baltimore, Md.

Miller, J. F.,

Worcester and Nashua Railroad, Worcester, Mass.

Morris, Elwood,

Schuylkill Navigation, Schuylkill Haven, Pa.

Morton, A. C.,

Atlantic and St. Lawrence Railroad, Portland, Me.

McRae, John,

South Carolina Railroad, Charleston, S. C.

Nott, Samuel,

Lawrence and Manchester Railroad, Boston.

Prichard, M. B.,

East Tennessee and Georgia R. R., Cleveland, Tenn.

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Trenton, N. J.

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Roberts, Solomon W.,

Ohio and Pennsylvania Railroad, Pittsburgh, Pa.

Sanford, C. O.,

South Side Railroad, Virginia.

Schlatter, Charles L.,

Northern Railroad (Ogdensburg), Malone, N. Y.

Sours, Peter,

Rahway, New Jersey.

Stark, George.,

Bost., Con. and Mont. R. R., Meredith Bridge, N. H.

Steele, J. Dutton,

Pottstown, Pa.

Trimble, Isaac R.,

Philad., Wil. & Baltimore Railroad, Wilmington, Del.

Tinkham, A. W.,

United States Fort, Bucksport, Me.

Thomson, J. Edgar.,

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Troost, Lewis,

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Whipple, S.,

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Williams, E. P.,

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" Barston, Pope & Co., "

" Earps & Brink, Philadelphia.

" E. Pratt & Brother, Baltimore.

John Barstow, Esq., Providence.

Lewis Bullard, Esq., Boston.

February 9, 1850.

6m*

United States Railroad Guide and Steamboat Journal.

CONTAINING OFFICIAL TIME ADVERTISEMENTS, Tables of Stations, Distances, Fares, Time, etc., with much miscellaneous matter for the travelling public. Price 12 cents a copy. Yearly subscription \$1. Published at 43 Ann street, New York.

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STEEL,

Of all Descriptions, Warranted Good.

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CIVIL AND MINING ENGINEER AND Attorney for Patents. Office and Laboratory, F St., opposite the Patent office, Washington, D. C.

Dudley B. Fuller & Co.,

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Manning & Lee,

GENERAL COMMISSION MERCHANTS,

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Agents for Avalon Railroad Iron and Nail Works.
Maryland Mining Company's Cumberland Coal 'CED
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CLEAN COP WASTE, suitable for cleaning Railroad, Steamboat and Stationary Engines, constantly on hand and for sale by

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October 27, 1849,

3m

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WROUGHT IRON SHAFTING,

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Furnishing Store.**
F. S. & S. A. MARTINE,
IMPORTERS AND MANUFACTURERS OF
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CARRIAGE LININGS,**
PLUSHES, CURTAIN MATERIALS, ETC.,
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3-4 and 6-4 Damasks, Union and Worsted; Mo-
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E. BROWN AND SON Mathematical inst. makers
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for sale, Theodolites, Levelling inst., Levelling rods,
Surveyors Compasses, and Chains, Cases of Mathe-
matical drawing insts. various qualities, together with
a general assortment of Ivory Scales and small insts.
generally used by Engineers.

**Samuel Kimber & Co.,
COMMISSION MERCHANTS**
WILLOW ST. WHARVES, PHILADELPHIA.
AGENTS for the sale of Charcoal and Anthracite
Pig Iron, Hammered Railroad Car and Locomotive
Axles, Force Pumps of the most approved con-
struction for Railroad Water Stations and Hydraulic
Rams, etc., etc.
July 27, 1849.

James Herron, Civil Engineer,
OF THE UNITED STATES NAVY YARD,
PENSACOLA, FLORIDA.,
PATENTEE OF THE
HERRON RAILWAY TRACK.
Models of this Track, on the most improved plans,
may be seen at the Engineer's office of the New York
and Erie Railroad.

To Railroad Companies.
—WROUGHT IRON WHEELS—
SAFETY AND ECONOMY.
NORRIS' LOCOMOTIVE WORKS,
SCHENECTADY, NEW YORK,
Are Manufacturing Wrought Iron Driving, Truck,
Tender, and Car Wheels—made from the best Ameri-
can Iron. Address E. S. NORRIS.
May 16, 1849.

Machinery Warehouse.
S. C. HILLS, No. 43 Fulton street, New York, has
constantly for sale Steam Engines, Boilers, Lathes,
Chucks, Drills, Planers, Force and Suction Pumps;
Tenoning, Mortising and Boring Machines, Shingle
Machines, Bolt and Nut Machines, Belting, Oil, Iron
and Lead Pipe; Rubber, Percha and Leather Hose,
&c., &c.
S. C. H.'s arrangements with several machine shops
are such that he can supply, at very short notice, large
quantities of machinery.
November 23, 1849.

George O. Robertson,
**BROKER IN SCOTCH AND
AMERICAN PIG IRON;**
Bar Iron, Lead, Spelter, Tin, Copper, etc.,
No. 4 Liberty Place, MAIDEN LANE,
(Near Broadway.)
NEW YORK

**Manufacture of Patent Wire
ROPE AND CABLES,**
For Inclined Planes, Suspension Bridges, Standing
Rigging, Mines, Cranes, Derrick, Tilters, &c., by
JOHN A. ROEBLING, Civil Engineer,
TRENTON, N. J.

Samuel D. Willmott,
**MERCHANT, AND MANUFACTURER OF
CAST STEEL WARRANTED SAWS,**
—AND FILES—
IMPORTER OF THE
GENUINE WICKESLY GRINDSTONES
NO. 8 LIBERTY STREET,
NEW YORK.

Doremus & Harris,
ANALYTICAL & CONSULTING CHEMISTS,
179 BROADWAY, NEW YORK.
SCHOOL OF CHEMISTRY.

IRON.

Railroad Iron.
3,000 TONS C. L. MAKE 63½ lbs. per yard,
now landing and to arrive.
Also contracts made for future delivery of above su-
perior make English Iron.
300 Tons Banks Best Iron, Round, Square and Flat.
200 " English Bar " " " " "
10 " 9-16 Square Iron for Railroad Spikes.
For sale in lots to suit purchasers by
DAVID W. WETMORE.
New York, March 26, 1850. 3m

**SPRING STEEL FOR LOCOMOTIVES, TEN-
DERS AND CARS.**—The subscriber is engaged
in manufacturing spring steel from 1½ to 6 inches in
width, and of any thickness required: large quantities
are yearly furnished for railroad purposes, and where-
ever used its quality has been approved of. The estab-
lishment being large, can execute orders with great
promptitude, at reasonable prices, and the quality war-
ranted. Address J. F. WINSLOW, Agent,
Albany Iron and Nail Works.

Railroad Iron.
THE Undersigned, Agents for Manufacturers, are
prepared to contract to deliver Rails of superior
quality, and of any size or pattern, to any ports of dis-
charge in the United States.
COLLINS, VOSE & CO.,
74 South St.
New York, June 1, 1850.

Railroad Iron.
1,500 Tons weighing 53 lbs. per lineal yard.
500 " " 57 " " "
500 " " 56 " " "
500 " " 60 & 61 lbs. "
Also 2½ x 7 flat rails. All the above being of approv-
ed patterns. For sale by
DAVIS, BROOKS, & CO.,
68 Broad street.
N.B.—Rails imported on commission, or at a fixed
price.

Iron.
Pig Iron, Anthracite and Charcoal; Boiler and Flue
Iron, Spring and Blistered Steel, Nail Rods, Best Re-
fined Bar Iron, Railroad Iron, Car Axles, Nails, Stove
Castings, Cast Iron Pipes of all sizes, Railway Chairs
of approved patterns for sale by
COLEMAN, KELTON & CABELL,
109 N. Water St., Philadelphia.
IRONDALE PIG METAL, MANUFACTURED
and for sale by the Bloomsburg Railroad Iron Co.
LINDLEY FISHER, Treasurer.
75 N. Water St., Philadelphia.

Railroad Iron.
2,000 Tons, weighing 53 pounds per lineal yard,
of the most approved pattern of T rails, in
store and to arrive, for sale by
COLLINS, VOSE & CO.,
74 South St.
New York, June 1, 1850.

Railroad Iron.
1,675 Tons, weighing about 61 lbs. per yard, 90
tons, weighing about 52 lbs. per yard, and
825 tons, weighing about 53½ lbs. per yard, of the lat-
est and most approved patterns of T rail, for sale by
BOORMAN, JOHNSTON & CO.,
119 Greenwich street.
New York, Feb. 25, 1850.

N.B.—B. J. & Co are also prepared to take con-
tracts for English rails, delivered in any of the Atlan-
tic ports of the United States.

Railroad Iron.
THE UNDERSIGNED, HAVING made arrange-
ments abroad, are prepared to contract for the de-
livery of Foreign rails, of approved brands upon the
most favorable terms.
They will also make contracts for American rails,
made at their Trenton works, from Andover Iron, in
whole or in part, as may be agreed upon.
They are prepared to furnish Telegraph, Spring and
Market Wire; Braziers and Wire Rods; Rivets and
Merchant Bars to order, all made exclusively from An-
dover Iron. The attention of parties who require iron
of the very best quality for special purposes, is respect-
fully invited.
COOPER & HEWITT,
17 Burling Slip, New York.
February 15, 1850.

Glendon Refined Iron.

Round Iron, Band Iron, Hoop Iron,
Square " Flat " Scroll "
Axles, Locomotive Tyres,
Manufactured at the Glendon Mills, East Boston, for
sale by
GEORGE GARDNER & CO.,
5 Liberty Square, Boston, Mass.
Sept. 15, 1849. 3m37

**PATENT HAMMERED RAILROAD, SHIP &
BOAT SPIKES.**—The Albany Iron Works
have always on hand, of their own manufacture, a
large assortment of Railroad, Ship and Boat Spikes
from 2 to 12 inches in length, and of any form of head
From the excellence of the material always used in
their manufacture, and their very general use for rail-
roads and other purposes in this country, the manu-
facturers have no hesitation in warranting them fully
equal to the best spikes in market, both as to quality
and appearance. All orders addressed to the subscrib-
ers at the works will be promptly executed.

JOHN F. WINSLOW, Agent,
Albany Iron and Nail Works, Troy, N. Y.
The above Spikes may be had at fact prices, of
Erastus Corning & Co Albany; Merritt & Co., New
York; E. Pratt & Br 1st, Es. Worcester Md

**LAP—WELDED
WROUGHT IRON TUBES**
FOR
TUBULAR BOILERS,
FROM ONE AND A QUARTER TO SEVEN
INCHES IN DIAMETER.
THE ONLY Tubes of the same quality and man-
ufacture as those so extensively used in England,
Scotland, France and Germany, for Locomotive, Ma-
rine and other Steam Engine Boilers.
THOMAS PROSSER & SON, Patentees,
28 Platt street, New York.

Railroad Iron.
THE UNDERSIGNED ARE PREPARED TO
contract for the delivery of English Railroad Iron
of favorite brands, during the Spring. They also re-
ceive orders for the importation of Pig, Bar, Sheet, etc.
Iron.
THOMAS B. SANDS & CO.,
22 South William street,
New York.
February 3, 1849.

Iron Store.
THE Subscribers, having the selling agency of the
following named Rolling Mills, viz: Norristown,
Rough and Ready, Kensington, Triadelphia, Potts-
grove and Thorndale, can supply Railroad Companies,
Merchants and others, at the wholesale mill prices for
bars of all sizes, sheets cut to order as large as 56 in.
diameter; Railroad Iron, domestic and foreign; Loco-
motive tire welded to given size; Chairs and Spikes;
Iron for shafting, locomotive and general machine-
purposes; Cast, Shear, Blister and Spring Steel; Bol-
ter rivets; Copper; Pig Iron, etc., etc.
MORRIS, JONES & CO.,
Iron Merchants,
Schuylkill 7th and Market Sts., Philadelphia.
August 16, 1849. 1y33

Railroad Iron.
THE MOUNT SAVAGE IRON WORKS, AL-
legany county, Maryland, having recently pass-
ed into the hands of new proprietors, are now prepar-
ed, with increased facilities, to execute orders for any
of the various patterns of Railroad Iron. Communi-
cations addressed to either of the subscribers will have
prompt attention. J. F. WINSLOW, President
Troy, N. Y.
ERASTUS CORNING, Albany
WARREN DELANO, Jr., N. Y.
JOHN M. FORBES, Boston.
ENOCH PRATT, Baltimore, Md.
November 6, 1848.

Railroad Iron.
THE SUBSCRIBERS ARE PREPARED TO
take orders for Railroad Iron to be made at their
Phoenix Iron Works, situated on the Schuylkill Riv-
er, near this city, and at their Safe Harbor Iron Works,
situated in Lancaster County, on the Susquehanna
river; which two establishments are now turning out
upwards of 1800 tons of finished rails per month.
Companies desirous of contracting will be promptly
supplied with rails of any required pattern, and of the
very best quality.
REEVES, BUCK & CO.
45 North Water St. Philadelphia.
March 15, 1849.

Monument Foundry.

A. & W. DENMEAD & SON,
Corner of North and Monument Sts.,—Baltimore,
HAVING THEIR
IRON FOUNDRY AND MACHINE SHOP
In complete operation, are prepared to execute
faithfully and promptly, orders for
Locomotive or Stationary Steam Engines,
Woolen, Cotton, Flour, Rice, Sugar Grist, or Saw
Mills,
Slide, Hand or Chuck Lathes,
Machinery for cutting all kinds of Gearing
Hydraulic, Tobacco and other Presses,
Car and Locomotive patent Ring Wheels, war-
ranted,
Bridge and Mill Castings of every description,
Gas and Water Pipes of all sizes, warranted,
Railroad Wheels with best faggotted axle, fur-
nished and fitted up for use, complete
Being provided with Heavy Lathes for Bor-
ing and Turning Screws, Cylinders, etc., we can
turn them of any pitch, length or pattern.
Old Machinery Renewed or Repaired—and
Estimates for Work in any part of the United States
furnished at short notice.
June 8, 1849.

Iron Wire.

REFINED IRON WIRE OF ALL KINDS.
Card, Reed, Cotton-flyer, Annealed, Broom,
Buckle, and Spring Wire. Also all kinds of Round,
Flat or Oval Wire, best adapted to various machine
purposes, annealed and tempered, straightened and
cut any length, manufactured and sold by
ICHABOD WASHBURN.
Worcester, Mass., May 25, 1849.

American and Foreign Iron.

FOR SALE,
300 Tons A 1, Iron Dale Foundry Iron.
100 " 1, " " "
100 " 2, " " "
100 " " Forge "
400 " Wilkesbarre " "
100 " "Roaring Run" Foundry Iron.
300 " Fort " "
50 " Catoctin " "
250 " Chikiswalungo " "
50 " "Columbia" "chilling" iron, a very su-
perior article for car wheels.
75 " "Columbia" refined boiler blooms,
30 " 1 x 1/2 flat iron.
50 " Best Penna. boiler iron.
50 " "Puddled" "
50 " Bagnall & Sons refined bar iron.
50 " Common bar iron.
Locomotive and other boiler iron furnished to order.
GOODHUE & CO.,
New York. 64 South street

American Pig, Bloom and Boiler Iron.

HENRY THOMPSON & SON,
No 57 South Gay St., Baltimore, Md.,
Offer for sale. *Hot Blast Charcoal Pig Iron* made at
the *Catoctin* (Maryland), and *Taylor* (Virginia), *Fur-*
naces; *Cold Blast Charcoal Pig Iron* from the *Clover-*
dale and *Catawba*, Va., Furnaces, suitable for *Wheels*
or *Machinery* requiring extra strength; also *Boiler*
and *Flue Iron* from the mills of *Edge & Hilles* in *Del-*
aware, and best quality *Boiler Blooms* made from *Cold*
Blast Pig Iron at the *Shenandoah Works*, Va. The
productions of the above establishments can always be
had at the lowest market price, for approved paper.
American Pig Iron of other brands, and *Rolled*
and *Hammered Bar Iron* furnished at lowest prices. *A-*
gents for Watson's Perth Amboy Fire Bricks, and
Rich & Cos. New York *Salamander Iron Chests*.
Baltimore, June 14, 1849. 6 mos

Wheel, Forge and Foundry Iron.

LOCUST GROVE Wheel Iron of great strength
and superior chilling property.
Balt. Charcoal Forge Iron, from Patuxent, Curtis
Creek and Gunpowder furnaces.
Elkridge Foundry Iron, of superior strength and
softness. Anthracite and Charcoal Iron from Penn-
sylvania and Virginia. Gas and Water Pipes, Lamp
Posts from Elkridge furnace.
LEMMON & GLENN,
6ms 62 Buchanan's Wharf, Baltimore.

Iron.

THE SUBSCRIBERS having resumed the agency
of the **New-Jersey Iron Company**, are prepared
to execute orders for the different kinds and sizes of
Iron usually made at the works of the company, and
offer for sale on advantageous terms.—
150 tons No. 1 Boonton Foundry Pig Iron.
100 " No. 2 do. do. do.
300 " Nos. 2 & 3 Forge do. do.
100 " No. 2 Glendon do. do.
140 " Nos. 2 & 3 Lehigh Crane do. do.
100 " No. 1 Pompton Charcoal do.
100 " New-Jersey Blooms
50 " New-Jersey Faggoting Iron, for shafts
Best Bars, 1/2 to 4 inch by 1/2 to 1 inch thick.
Do do Rounds and Squares, 1/2 to 3 inch.
Rounds and Squares, 3-16 to 1 inch.
Half Rounds, 1/2 to 1 in. Ovals & Half Ovals 1/2 to 1 1/2 in.
Bands, 1/2 to 4 inch. Hoops, 1/2 to 2 inch.
Trunk Hoops, 1/2 to 1 1/2 in. Horse Shoe & Nut Iron.
Nail Plates. Railroad Spikes.
DUDLEY B. FULLER & Co., 139 Greenwich-
st. and 85 Broad-st.

WILLIAM JESSOP & SONS' CELEBRATED CAST-STEEL.

The subscribers have on hand, and are constantly re-
ceiving from their manufactory,
PARK WORKS, SHEFFIELD,
Double Refined Cast Steel—square, flat and octagon.
Best warranted Cast Steel—square, flat and octagon.
Best double and single Shear Steel—warranted.
Machinery Steel—round.
Best and 2d gy. Sheet Steel—for saws and other pur-
poses.
German Steel—flat and square, "W. I. & S." "Eagle"
and "Goat" stamps.
Genuine "Sykes" L. Blister Steel.
Best English Blister Steel, etc., etc., etc.
All of which are offered for sale on the most favora-
ble terms by **WM. JESSOP & SONS,**
91 John street, New York.
Also by their Agents—
Curtis & Hand, 47 Commerce street, Philadelphia.
Alex'r Fullerton & Co., 119 Milk street, Boston.
Stickney & Beatty, South Charles street, Baltimore.
May 6, 1848.

JOHNSON, CAMMELL & Co's Celebrated Cast Steel,

AND
ENGINEERING AND MACHINE FILES,
which for quality and adaptation to mechanical uses,
have been proved superior to any in the United States.
Every description of square, octagon, flat and round
cast steel, sheet, shovel and railway spring steel, best
double and single shear steel, German steel, flat and
square, goat stamps, etc. Saw and file steel, and steel
to order for any purposes, manufactured at their Cy-
clops Steel Works Sheffield.
JOHNSON, CAMMELL & CO.,
100 William St., New York.
November 23 1849.

Railroad Iron.

OF ANY PATTERN AND WEIGHT,
Of a Favorite Brand,
And deliverable in Bond, or Duty paid, at any Port of
the U. S., contracted for on favorable terms, by
CHARLES ILLIUS,
20 Beaver St., New York.
Pig and other Iron also contracted for. Sole Agent
for "Baxter's Machine and Burning Oil"—particu-
larly adapted for "Railroads" and other Machinery—
Preferred to Sperrin by the many now using it, and 25
per cent. cheaper.

CUT NAILS OF BEST QUALITY, BAR IRON
(including Flat Rails) manufactured and for sale
by **FISHER, MORGAN & CO.,**
75 N. Water St., Philadelphia.

Ogden & Martin's ROSENDALE CEMENT.

WE are prepared to enter into arrangements for
supplying our Cement for public works or other
purposes. We warrant the cement equal in every re-
spect to any manufactured in this country. It attains
a great degree of hardness, sets immediately under
water, and is a superior article for masonry coming in
contact with water, or requiring great strength.
For sale in tight barrels, well papered, at their office
by **OGDEN & MARTIN, 104 Wall st.**
February 16, 1850. 1y*
The above cement is used in most of the fortifica-
tions building by government.

To Steam Engine Builders.

THE Undersigned offer for sale, at less than half its
cost, the following *new machinery*, calculated for
an engine of 62 inches cylinder and 10 feet stroke, viz.
2 Wrought Iron Cranks, 60 inches from centre to
centre.
1 Do. do. Connecting Rod Strap.
2 Do. do. Crank Pins.
1 Eccentric Strap.
1 Diagonal Link with Brasses.
1 Cast Iron Lever Beam (forked).
The above machinery was made at the West Point
Foundry for the U. S. Steamer Missouri, without re-
gard to expense, is all finished complete for putting to-
gether, and has never been used. Drawings of the
cranks can be seen on application to
HENRY THOMPSON & SON,
No. 57 South Gay St., Baltimore, Md.
Sept. 12, 1849.

8,000 Tons Railroad Iron.

THE OHIO AND PENNSYLVANIA RAIL-
ROAD CO. wish to contract for eight thousand
tons of Railroad Iron, for the eastern division of their
road, extending westward from Pittsburgh. Three
thousand tons to be delivered on the Ohio river at
Pittsburgh and Beaver, before the close of canal naviga-
tion in the present year, 1850; and the remainder
in the spring of next year. The rails are to be of the
H pattern, in lengths of 20 feet, and are to weigh 60
lbs. per lineal yard. They are to be subject to the in-
spection of Solomon W. Roberts, Chief Engineer.—
For further particulars address the President of the
Company at Pittsburgh.
By order of the Board of Directors.
WM. ROBINSON, Jr., President.

S. S. Keyser & Co., IRON WAREHOUSE,

Corner of South and Pratt Streets,
BALTIMORE, MD.
Selling Agents for the Rough and Ready Bar Iron
and Elk Boiler and Flue Iron Rolling Mills, Sarah
and Taylor Furnaces, and Wrightsville Hollow Ware
Foundry, and Dealers in Bar and Sheet Iron, and
Cast, Sheer, German, Blister, Spring and Electrodes
Steel, etc., etc.

Smith & Tyson,

GENERAL COMMISSION MERCHANTS,
No. 25 South Charles St., Baltimore, Md.
AGENTS for the Celebrated Columbia Pig Iron,
suitable for Car Wheels and Chilled Rolls.
Columbia refined Charcoal Blooms; Refined Char-
coal Juniata Billet Iron for Wire; Refined Iron for
Bridging, of great strength; Cut Nails, Spikes, and
Brads; Railroad Spikes and Wrought Chairs. 22tf

To Railroad Companies and Contractors.

FOR SALE.—Two Locomotive Engines and Ten-
ders, at present in use on the Beaver Meadow
Railroad, being too light for their coal trains, but well
calculated for either gravel or light passenger trains.
They weigh, in running order, about 8 tons each—
having one pair of driving wheels 4 feet diameter, 4
truck wheels 30 inches diameter, with cylinders 10 in.
diameter, and 18 inches stroke of piston. Tenders on
4 wheels. Address **JAMES ROWLAND,**
Pres't. Beaver Meadow Railroad & Coal Co.,
Philadelphia.
or, **L. CHAMBERLAIN, Sec'y,**
at Beaver Meadow, Pa.
May 19, 1849. 20tf

Railroad Instruments.

THEODOLITES, TRANSIT COMPASSES,
and Levels, with Fraunhoffer's Munich Glasses,
Surveyor's Compasses, Chains, Drawing Instru-
ments, Barometers, etc., all of the best quality and
workmanship, for sale at unusually low prices, by
E. & G. W. BLUNT,
No. 179 Water St., cor. Burling Slip.
New York, May 19, 1849.

Rosendale Cement.

THE NEWARK AND ROSENDALE LIME
AND CEMENT CO. are now manufacturing at
their works in NEWARK, N. J., and Ulster county,
N. Y., a very superior article of *Hydraulic Cement*—
also Lime Calcine Plaster, etc. Contractors and deal-
ers will find it to their advantage to call or make ap-
plication before purchasing elsewhere. All communi-
cations addressed to the subscriber, at Newark, N. J.,
will be punctually attended to.
1y*15 **HENRY WILDE, Secretary.**

Patent India Rubber Steam Packing.

THIS article, made by the subscriber, who alone is authorised to make it, is warranted to stand as high a degree of heat as any that has been or can be made by any person—and is the article which has made the reputation of India Rubber Steam Packing and the demand therefor. A large assortment of all thick nesses requisite for any description of engines, steam pipes, valves, etc., constantly on hand and for sale by the manufacturer and patentee, who will give every information regarding its properties, mode of use, etc. at the warehouse. JOHN GREACHEN, JR.,
98 Broadway, opposite Trinity Church.
New York, October, 1849.

Passenger Car Linings.

THE Advertiser continues to make to order the Enamelled Car Linings which have been so highly approved the last three years, and are now exclusively used by all the Northern Railroads. No pains are spared to get out new styles, and adapt them to the tastes of every consumer.
Orders addressed to CHARLES STODDER, No. 75 Kilby street, Boston, will have prompt attention.
March 23, 1850. 2m

CAUTION.

RAILROAD COMPANIES and others are hereby cautioned against using or vending our improvement for easing the lateral motion as applied on Railroad Cars. Letters Patent having been granted to us in 1841, any party or parties so making or using said improvement without license from us will be proceeded against according to law.
DAVENPORT & BRIDGES.



P. H. Griffin,

Corner of Steuben and James Sts. Albany, N.Y.
CONTINUES to manufacture copper flues for locomotive boilers, brewers' coppers, stills, tanner heaters, etc. Copper work in general, at the shortest notice. He has constantly on hand brass cocks, brass valves, copper pumps of every variety.
Orders promptly attended to. 1y14

FOWLER M. RAY'S Patent India-rubber Railroad CAR SPRING.

New York and Erie Railroad Shops.
Piermont, March 26, 1850.

This will certify that from practical experience in the use of Fowler M. Ray's India rubber Car Springs, I believe them to be far superior to any others now in use.

I have never known them to be affected by any change of temperature, as other Rubber Springs have been affected on this road.

I am at the present time repairing a Passenger Car that Mr. Ray and myself mounted with his springs about two years and eight months since.

The springs are at the present time as perfect, to all appearances, as when first applied to the car.

Respectfully yours,

HORACE B. GARDNER,
Foreman of the Car Shops.

Supt. Office N.Y. & H. R.R., }
New York, March 8, 1850.

This is to certify that we have used the Rubber Springs manufactured by Mr. F. M. Ray for the past twenty months, "both for Passenger and Freight Car Springs and Bumpers, and of different sizes" and have in every case given entire satisfaction, and I consider them the best spring now in use.

M. SLOAT, Supt.

Harlem R.R. Depot, }
New York, March 7, 1850.

This is to certify that we have used Mr. F. M. Ray's India-rubber Springs for over eighteen months, and find them to be easy and durable, and recommend them to railroad companies as being superior to anything we have tried.

J. M. SMART,
Foreman at 42d St. Depot.

Office New Jersey Railroad Co., }
Jersey City, March 8, 1850.

FOWLER M. RAY, Esq.,

Dear Sir: In answer to your enquiries respecting the operation of the Vulcanised Rubber Springs, purchased by our company from you some two years since, I reply that they are superior to any spring in use. (that I have either seen or heard of).

The improved form of your spring, consisting of a solid piece of vulcanised rubber with bands on the outside, is far superior to your first form, consisting of disks of rubber with metallic plates interposed.

The last named form was tried, if you recollect, at a much earlier period; and then was replaced by your last form.

I have no hesitation in saying that your springs have given entire satisfaction, and most cheerfully recommend them to railroad companies throughout the country for the following reasons:

1st. The cost is 30 per cent. less.
2d. Saving of weight on each car of 8 wheels from 700 to 800 lbs.

3d. Less care and attention is required, as they are not liable to get out of repair.

4th. A great saving is secured in the wear and tear of the cars and rails from their great elasticity.

5th. The freedom from noise.

6th. There is greater safety in case of accident, as they cannot be broken.

7th. The comfort of passengers is enhanced sufficiently to pay the expense, waiving all the other reasons that I have given.

Should this fail to satisfy any person enquiring, you are at liberty to refer to me, No. 150 Washington St., Jersey City. Yours respectfully,

T. L. SMITH, Supt.

New York, March 11, 1850.

I have used the Patent India-rubber Spring purchased of Mr. Ray, upon the cars of the New York and New Haven Railroad, and have found them efficient and economical; and when applied to the axles and draw springs, believe them to be quite equal to any in use. I have found a combination of these springs with a steel spring under the transom beam a very satisfactory arrangement, and am now using this plan in all new cars.

Yours respectfully,
ROBERT SCHUYLER.

February 25, 1850.

From practical observation of the use of the India-rubber Car Springs, manufactured and sold by your company, we are entirely satisfied in their application, and do not hesitate to recommend them as elastic, durable, requiring no repairs for years, and retaining their consistency during all extremes of weather. We have applied them for the past two years, and consider them superior for all railroad purposes.

Yours truly,

OSGOOD BRADLEY, Car Builder, Worcester.
T. & C. WASON, do. Springfield.
DEAN, PACKARD & MILLS, do. do.
DAVENPORT & BRIDGES, do. Cambridgeport.

Office of the New Jersey Railroad Co., }
Jersey City, March 7, 1850.

This is to certify that we have had Mr. F. M. Ray's India-rubber Springs in constant use under our cars, and as Bumper Springs for upwards of two years, and they have in every way given perfect satisfaction.

The present form of spring we deem far superior to the form of Disk, having used both forms, although we have none of those made in Disks at present in use.

We take pleasure in recommending these springs to all railroad companies.

J. P. JACKSON, Vice Prest.
New Jersey Railroad and Trans. Co.

Roxbury, February 28, 1850.

In compliance with your request, I take great pleasure in stating the result of my experience in the use of "Ray's Patented Vulcanised India-rubber Car and Engine Springs." We have used them nearly two years, and never had one fail in any way. The cold weather does not affect them, as it has other rubber springs we have used.

With sixteen years' experience as superintendent of machinery on the Boston and Providence railroad, I take pleasure in saying that your springs are the best we ever used, or I ever saw used elsewhere. We have 20 cars rigged with them, of which I can say that the springs are as good now as when first applied. I put 24 lbs. of the rubber under the forward end of one of our heaviest engines, taking off 250 lbs. of steel springs—it has been in use 18 months, and is in as good condition now as when first put under the engine.

Very respectfully yours,

GEO. S. GRIGGS,
Supt. of Machinery, Boston and Prov. R.R.

Fall River, February 2, 1850.

In answer to yours of the 20th ult. I would say that this company has for some 10 or 12 months past been using "Ray's India-rubber Springs." We have applied them to both passenger and freight cars with uniform success. They have invariably preserved their elasticity and consistency through all the extremes of weather; and we are now applying them whenever the steel spring fails. I am well satisfied that they are particularly adapted for railroad purposes.

Very respectfully yours,

GEO. HAVEN,
Supt. Fall River Railroad.

Jersey City, March 9, 1850.

This is to certify that the present form of Mr. F. M. Ray's India-rubber Car Spring I consider far superior to the form of Disk, having used both forms.

I take pleasure in recommending these springs to all railroad companies.

DAVID H. BAKER,
Foreman of Car Shop of N.J. R.R. & Trans. Co.

Boston, March 5, 1850.

In answer to your enquiry about India-rubber Springs, I have to say that we have used them to a considerable extent on both freight and passenger cars, and also on several of our tenders; and I am very well satisfied that they answer all the purposes for which they are intended. I believe the India-rubber will soon supersede all other springs for cars and tenders.

Yours truly,

S. M. FELTON,
Supt. Fitchburg Railroad.

Old Colony Railroad Office,
Boston, March 6, 1850.

EDWARD CRANE, Esq.,

President New England Car Co.,

Dear Sir: In compliance with your request I would state that the Old Colony Railroad Comp'y have had in use upon their road, India-rubber Springs furnished by your company, for more than eighteen months past, during which time they have been extensively used under Passenger and Freight Cars, Locomotive Tenders, and for Drawer and Buffing Springs, with the most perfect success. The elasticity and consistency of the Rubber has never been unfavorably affected by either extremes of heat or cold—and from the experience which we have had in the use of Rubber Springs, I think them well adapted for railroad purposes—and therefore we have for some months past used Rubber almost exclusively, in all places where springs are required.

Respectfully yours, etc.,

JAS. H. MOORE,
Supt. O. C. Road.

Troy, February 27, 1850.

We have been using your India-rubber Car Springs for nearly two years—and we take pleasure in saying that in our opinion the rubber has to a certain extent already, and may eventually entirely supersede all other Springs for Railroad Car purposes. We now use it entirely for Draw Springs and Bumpers, considering it better and lighter than steel.

During our two years' experience in the use of it, we have not known any to lose their elasticity, or fail in any way; and we cheerfully recommend the rubber for railroad car springs. Very respectfully,

EATON, GILBERT & CO.

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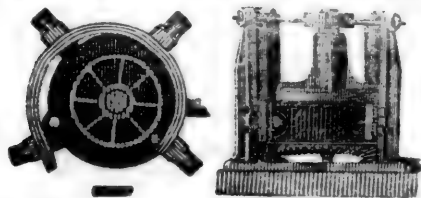
And in the principal cities and towns in the U. States. The Premium of the AMERICAN INSTITUTE was awarded to the Etna Safety Fuse at the late Fair held in this city.

November 3, 1849.

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MACHINERY.

Henry Burden's Patent Revolving Shingling Machine.



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P. A. BURDEN, Agent,
Troy Iron and Nail Factory, Troy, N. Y.

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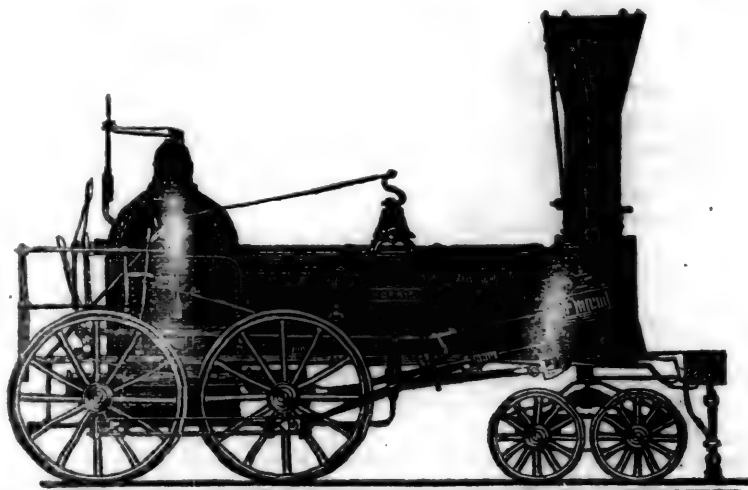
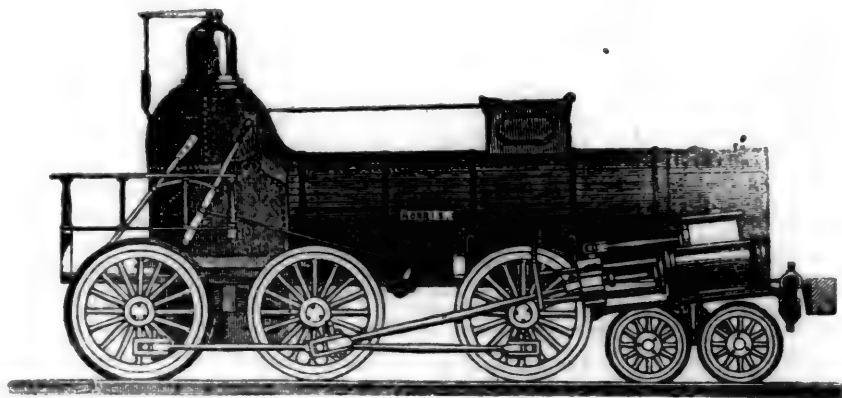
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To Inventors and Patentees.

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AMERICAN RAILROAD JOURNAL.

STEAM NAVIGATION, COMMERCE, MINING, MANUFACTURES.

HENRY V. POOR, Editor.

ESTABLISHED 1831.

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American Railroad Journal.

PUBLISHED BY J. H. SCHULTZ & Co., 136 NASSAU ST.

Saturday, June 23, 1850.

An Essay on Pen and Pocket Cutlery,

Embracing a Detailed Description of the Mechanical, Chemical, and Manual Operations Performed on Certain Raw Materials, to Convert them into the Means, Implements, and Materials, for Manufacturing Pen and Pocket Knives.

BY A. L. HOLLEY.

Continued from page 370.

CHAPTER IV.—GRINDERS' ROOM, APPARATUS, IMPLEMENTS, AND MODE OF OPERATION. THE BURSTING OF A STOVE.

The grinding room of a cutlery establishment is always best lighted, usually from the South, that it may be warm, and particularly that the morning and evening sun may not shine directly upon the operator, who always faces the windows, and is divided into a series of frames, some two feet high, alternating with alleys and running back from the light. On the front end of each frame a grindstone

is hung on "points" in an iron trough (erroneously called by English grinders "trow") which reaches up to the axle on all sides, and is partially filled with water. A heavy plank seat, called the *horseing*, the lower front of which is fitted to the stone, is placed horizontally over the trough, its front directly above the axle, and its upper surface even with the stone's face, (thus leaving one fourth of the latter uncovered) and chained to the trough, that it may partially resist the force of the fragments should the stone burst. In the rear of the stones, are the glazers, lap wheels and polishers, which will be afterwards described.

For knife blades and razors, the Wickersly stone is used, which is a fine, sharp-grained, brittle, yellow stone, imported from the quarries of Wickersly in the vicinity of London. Their weight averages 150 pounds, though some weigh 175 pounds or more. They are from 24 to 36 inches in diameter, and from four to six inches in thickness, revolving by means of a band passing from a small drum on the axle to a large one in the rear from 500 to 700 times per minute. They are hung as stones usually are, then secured by cast iron plates which are screwed firmly against either side of the stone by a collar and nut on the shaft, in order that greater speed may with safety be applied; as stones simply wedged to the shaft often split by the velocity, the centrifugal force overcoming the cohesive attraction, and the fragments fly off in a tangent with tremendous speed.

There is one grinder, at least, in America, who has been seated over 17 different stones when they have burst, and who still pursues his work with as little apparent fear as ever. Persons are often killed or shockingly mangled by this cause, as the fragments usually crush all obstacles in their course. A grinder was once holding a sythe over a stone of great size, and moving at unusual speed, which, as he was bending over it, burst into halves, one of which was deeply imbedded in the earth beneath, the other carrying away with it the unfortunate grinder, tore up two floors above, and shot far into the air beyond the roof. Clots of gore, fragments of torn flesh, and snarled locks of hair, were seen hanging from the splintered floors, the walls were spattered with blood, and no portion of the body could be identified, such was the force of the mass below, and the resistance of the timber and plank above.

The majority of pocket blade grinders at the pre-

sent time, however, are as safe while pursuing their labors as the farmer in his field, as stones seldom burst; and when they do, the force of the pieces is so greatly diminished by the plates, that they seldom break the chains of the horseing. Another species of excessively hard, fine-grained, blue stone, found in Nova Scotia, is used for purposes which will be afterwards mentioned, and is hung in the same manner as the Wickerslies, though often without the plates, owing to its hardness and the consistency of its particles. The stones are turned on the faces and sides before using, and run so regularly that motion is scarcely perceptible.—The blades are held in small pliers, and ground on the mark, and the opposite, or pile side, and lastly on the back and swages. The faces of pen blades are left slightly concave, and of pockets convex.—The concavity of the former causes them to take hold faster, and is formed by holding the blade in one position on the stone, (which for pen blades is always of small diameter, being worn down some inches by pocket blades) and the convexity of the latter is made by "rolling" the blade on the stone. After grinding, the blades are thrown into fine lime which absorbs the water remaining on them with remarkable avidity, thus easily and effectually preventing oxidation. Lime will remain perfectly dry after having absorbed one third of its weight of water. After the stones are worn out for grinding pen knives, they are used for razors, or cast aside as useless except for walls and like purposes. The blade is held down to the stone by a small piece of leather termed the "patch," in the left, then in the right hand of the operator, and sends off a shower of steel particles ignited by friction, so that the sparks and water together fly off from the stone's surface in a body, each element apparently striving for the mastery. The stone is often made true and regular by holding on it a piece of nail rod, called the "racing iron." Blades which are crooked are made straight by means of a small setting hammer and an anvil which stands by the trough. A good workman will grind about one gross of pocket blades per day, or two gross of pen blades. Grinding steel is considered an unhealthy business, as it requires the operatives to bend constantly, and to swallow very fine steel and stone dust, though grinders are apparently as healthy and happy as other workmen, and are not obliged to labor steadily but rest frequently. This is, as before stated, a lucrative employment, if faithfully followed up and

attended to, and will be farther described in a following chapter.

CHAPTER V.—DESCRIPTION OF COMMON KNIVES AND THEIR PARTS. KNIVES CLASSIFIED. THE MAIN POCKET PATTERNS DESCRIBED. ODD AND UNCOMMON KNIVES DESCRIBED. SHORT HISTORY OF CUTLERY. SPRING KNIFE MANUFACTORIES.

Having classified, and followed the knife blades from the iron before it is converted into steel, through the processes of forging, tempering and grinding, and left them ready for the cutler, I will describe the different kinds of knives, and look into the department called the handle-maker's, or cutlers.—There are many hundreds of patterns of pocket cutlery extant, but those in most universal use, and of far the greatest utility, do not probably exceed 200 in number, though covered with different substances and constructed from different materials, they may exceed a thousand different kinds. Knives usually consist of blades, springs, bolsters, scales, covering, shields and rivets. Springs are strips of steel, tempered with oil, by which they are enabled to take their former shape after being bent, and which, except in silver, or solid steel back knives, forms the back, and keeps the blade open or shut. Scales are thin strips of metal, forming the lining to the knife, to which the covering is rivetted, and to the ends of which the bolsters are fastened.

Middle scales form the partitions in all knives having an even number of blades above four, or in all one ended knives (or those having blades but in one end) which have more than one blade. Slips, are short half scales, running from the middle rivet, and dividing two or more of the blades in the pen end of all knives containing an odd number of blades. The covering is the scales of ivory, horn, etc., commonly called the handle. Bolsters are thick pieces of metal through which the blade rivet passes, and are with the thin metal scale called by the general name of scales, as they form a distinct part of the knife. The shield is a tablet or strip of silver inserted into the handle for ornament, or to receive the owner's name. Rivets number from one to sixty in knives of different dimensions and kinds. Some knives are composed of only three pieces—the blade, rivet and handle; the latter being a solid piece of steel, comprising the spring, scales and bolsters. Some scales and bolsters are a solid strip of metal sufficiently thick without covering. The sides of a knife without bolsters, but with covering, are called shadows. The principal patterns of knives in general use, are divided into jack, pen and pocket knives. Jacks, called by Sheffielders pockets, are of many different shapes and sizes, but always one-ended, finished in a cheaper manner than pockets or pens, and have always a large pocket, and often one or more large pen blades. Pen knives are both one and two-ended, usually smaller than pockets, and never containing any but pen blades, and are particularly adapted to quill pen making. The varieties of pocket knives in most general use may be reduced to three patterns, each of which may be of different sizes and materials, and contain different numbers of blades. They are the Norfolk, Congress, and Corboe or Wharncliffe patterns. Norfolk knives have a back irregularly concave each way from the middle rivet, blades sunk to the swages in the handle, and round ends. The inside edges of the front, which is convex, are finished with concave recesses through which the nail may reach the nail marks. The pattern is considered very genteel and handsome, and was named from the Duke of Norfolk. Con-

gress, or as formerly called by the Sheffielders "four blade" knives before used as Congress knives in this country, are now made with from two to eight or more blades. The knife is broadest at the middle rivet, with a convex front, and concave back. The blades are generally one forward point, or "sheep foot" pocket, a square and a forward point pen, and a nail blade. The corboe, or Wharncliffe knife, was made by one John Mason, 23 years ago, for Lord Wharncliffe, who it is said made the pattern from the shape of his leg. Great quantities of this variety are now manufactured in England and America. The back and front are serpentine, or each form an OG in architecture. The ends are round, and the pen end narrowest. The pocket blades of these and of Norfolks, both of which are generally three bladed, have a round tang end, and are not kept fast by the spring, when at right angles with the handle. Many other patterns are in use, among which are the Lady Wharncliffe, the coffin and fish patterns. Knives are often shaped like the human body, shoes, legs, cannons, etc. The English Parliament knives are usually one-ended, having two blades, a "bean head" (or a round head opposite the blade end), stag or buffalo covering, and steel scales and bolsters, and are called the "steel knife." They are made by Rogers, No. 6, or Mappin, No. 66 Norfolk street, Sheffield.

Knives are often constructed containing a great number of blades, as the lobster, baloon and round knife, in which the springs are invisible, and the blades open on each side. In Rogers' show room in Sheffield is a knife containing 1850 blades. It was made in 1828, and has received an additional blade every year. George the 4th of England was once presented with a knife, one inch long, containing 400 blades. In Rogers' show room, and elsewhere, may be seen knives containing blades of every variety, saws, chisels, gimlets, and carpenter's, shoemaker's, surgeon's and whittler's tools, of all sizes and shapes. Pistols and daggers are often inserted into knife handles, together with blades, also forks, cork screws, whistles and blades of every sort for the use of English hunters, and sporting gents who drink porter and eat cold ham in the woods.

Tanner's knives, containing their implements and blades, handles with blades in one end, and a machine for quill pen making on the other, and scissors knives are often made in Sheffield, but seldom in America.

Weapons called by Sheffielders 'fly open knives,' are constructed so that the blade will open by pressure on the shield, remain open by an apparatus called a lock, or catch back, and are shut by touching a spring connected with the latter. The Barlow knife, renowned in antiquity, had usually a long bolster, crooked handle and spear (often pewter) blade. They were once, as says the poet,

"—all the go,"

and the fever after them in some sections was very fatal among youth. Now only here and there a solitary relic remains of this celebrated "genus whittleendi," which is but a monument of the vicissitudes of taste and fashion. *Sic transit gloria mundi.* According to some authorities, coarse common jack knives, called whittles, were made in Sheffield as early as 1297, and spring knives began to be manufactured in 1643, which statement, being in a Sheffield history, is probably correct, although according to another author it was stated in our first chapter, that cutlery was first made in England in the year 1563. The first knives, at all

events, were like short swords, or daggers, having no joint or spring, but a round solid handle. Thus they were made for perhaps hundreds of years, when the better knowledge of metals and tools led to the construction of spring cutlery. This has been constantly improving, and almost perfectly supplying the wants and answering the purposes of those who use it, though its manufacture will be revolutionised by Americans, and its value consequently so much lessened, as to enable every man to carry what is now termed an expensive and fine knife. Within one hundred years, spring knives were composed entirely of steel, with the exception of the covering, and till lately all tanges were made square, like those of jack knives, the kick commencing at the neck of the blade. Those which are generally used in fine knives at present, were first introduced and patented by Rogers. There are many cutlery establishments in Sheffield, and some in other English cities, but the principal manufacturers of pocket knives in Great Britain, and at present in the world, are Rogers, Wolstenholme, (Columbia works) Mappin, and Wragg.—Perhaps there are larger establishments than these, but these mentioned produce the best work.

There are several establishments in the United States, besides those in Connecticut, but are very small, and do comparatively a small business.—Lakeville, Waterville, Naugatuck and Plymouth, Conn., produce the best American pen and pocket knives, and those which are equal in every respect to England's best.

To be continued.

From the Glasgow Practical Mechanics Journal.
A Chapter in the History of Railway Locomotion.

It has been observed by some sapient moralizer, that when a great work is to be done, a man is always found to do it—or rather, he steps forward of his own accord and undertakes the job. While we are not prepared implicitly to adhere to this wise saw, we cannot well escape its application in railway history, for it must be allowed that when thirty years ago, the increasing commercial importance of the country demanded a proportionately improved mode of conveyance, which should combine the requisites of economy, speed, and commercial practicability, George Stephenson got up and supplied the deficiency. This he did by the extension of the embryo system then partially in use in his own district of the north of England, for the conveyance of coals to the staiths, or shipping places.

The extent of these colliery lines did not exceed four or five miles, and, looking at the imperfection of the power employed upon them, little could be said of their chance of superseding horse labor.—It cannot, nevertheless, be said that, even at this early date, the great utility inherent in the system was not tolerable apparent to a few of those early mechanicians whose names have now become interwoven with its fame. Their acute perception enabled them to distinguish, through the then crude and imperfect state of applied mechanics, the immense resources which lay shrouded in futurity, waiting for time and human experience to develop them. The first iron railway ever laid down, to the extent of twenty five miles, was the Stockton and Darlington line, which was opened on the 27th of September, 1825, the management of the working power, consisting of locomotives, stationary engines, and horses, being entrusted to Mr. Timothy Hackworth, of whose efforts in the introduction of locomotive mechanism we here propose to treat. Twenty miles were worked by locomotives and

horses, the two classes of power being placed in competition with each other.* Owing to the inefficient condition of the locomotive power, the company had all but determined to abandon steam in favor of horses, when Mr. Hackworth proposed to construct an engine suitable for working the traffic on this extent of line. This offer was accepted by the company, and, by way of economy, it was determined that the boiler of Wilson's engine should be made to serve for the new one. This boiler was a plain cylinder, 13 feet in length, and 4 feet 4 inches in diameter. The heating surface was obtained from a double tube of malleable iron, in the form of the letter U, traversing the whole length of the boiler. One side of this tube was made available for the fire grate; and the heated vapor being passed through it, was returned by the opposite one to the chimney, which was actually a vertical continuation of this end. With this contrivance the engine had a heating surface double that of any other engine of its time. She was carried on six 4-foot wheels, four of them being spring mounted, and was the earliest of the six-wheel coupled class. The cylinders, 11 inches diameter, and 30 inches stroke, were placed vertically at what is now the smoke box end of the engine, and worked directly upon the first pair of wheels. At the same end was attached a malleable iron cistern, into which the water passed from the tank, previous to being introduced into the boiler, the driver having the power of regulating the supply; and a pipe from the steam exhaust was led into the cistern, for the purpose of admitting steam at pleasure, to heat the water. Another pipe was provided for the purpose of leading off a steam jet from the exhaust pipe at the chimney end, for discharge beneath the grate, the intention being to facilitate combustion.

In addition to its being the original of a class of engines now so universal, this engine was the first which had a blast pipe fitted to it, the whole of the exhaust steam—excepting only such a portion as was required for the purposes before alluded to—being conveyed into the centre of the chimney, and there thrown out in a jet from a conical pipe. She was named the "Royal George," and commenced working in October, 1827.

As an exposition of her superiority over the horses—which, be it remembered, were at this time in the ascendant, as regards their employment on railways—we may compare the actual results of the two systems of working.

Cost of "Royal George," \$425; number of tons conveyed by her in one year (1828) 92,442 tons over twenty miles; cost of conveyance, 4d. per ton per mile, or, including all repairs and maintenance, and interest on sunk capital, at 10 per cent., £466; an economy in working which is rarely exceeded at the present day, after a lapse of twenty three years. The cost of the same work performed by horses was £998, showing a difference of £532 in favor of this engine, over the animal power.

The points of improvement in the Royal George which conduced to this important result, evidencing not only her great superiority over her compeers, but the vast resources of the imperfectly developed locomotive system were simply these: the increased evaporative surface of the boiler; the perfect command over heavy loads in all states of the weather, by reason of the superior tractive adhesion derived from the six coupled wheels; and the in-

roduction of the blast pipe, an invention which alone will carry down the name of Hackworth to future ages in connection with early locomotive history.

Up to the period of which we write, no really efficient locomotive was in use, as the steam pressure invariably fell, in spite of the best efforts of the driver; and the superiority of the Royal George in this respect alone, at once elevated it far above its contemporaries, for it was capable of maintaining a speed of nine miles per hour throughout its run of twenty miles, in all weathers.

Among all the details of the locomotive, perhaps no one point has afforded so much material for speculative invention as the exhaust draught apparatus, and yet, out of the accumulation of schemes for this purpose, which have taken every advisable shape, as fanners and bellows, nothing has arisen to supersede the original blast pipe in the smallest degree. After twenty years' experience, nothing more has been elucidated than the simple fact that to get it as wide as possible is the ultimatum of perfection. In naming the novelties brought out in the Royal George, we must not forget to add that she possessed the first short stroke force pump, as also the first set of adjustable springs for the safety valves, instead of weights.

To illustrate the state of popular feeling prevalent at this time in reference to the contest between locomotives and horses on the Stockton and Darlington line, we extract a few passages from the letter addressed by Mr. Robert Stephenson to Mr. Hackworth, dated Liverpool, July 7, 1828:

"The directors having heard here, by some channel or other not favorable to locomotive engines, that there has always been a great number of horses on the line; and that the horses were beating the engines off—in answer to this I understood you to say, that at one time you had completely run the horses off, but in consequence of the late accident, and the heavy engine being laid aside, you had been obliged to employ horses again.—Was not this the sole cause of the horses being employed? and was there not an instance a little while ago, of the horses being entirely removed from the line of road? Please write me by return of post, or, at all events, at your earliest convenience, answers to these queries. I cannot wonder at the travelling engines having so much to contend, when I come in contact with enemies of them every hour; and they prove to be enemies without reason, they oppose the engines merely because certain things have been said against them."

The accident alluded to in this extract was the explosion of one of the engines, supposed to have been caused by a driver having neglected to remove a spring which was employed to steady the weight upon the safety valve lever during running, this removal being necessary whenever the engine stopped. The "heavy engine" was the Royal George, then undergoing repairs; hence the want of the two engines involved the necessity of employing horses until the repairs were effected. In a letter written by Mr. G. Stephenson, dated Liverpool, July 25, 1828, the following occurs:

"Brandreth has given a report here that you are going to lay off the locomotive engines. It is so? It was a great pity that the accident took place with the tubes. We have tried the new locomotive engine at Bolton; we have also tried the blast to it for burning coke, and I believe it will answer.—There are two bellows, worked by two eccentrics underneath the tender."

In the early part of the year 1829, as the Liver-

pool and Manchester line approached completion, the directors laid their heads together to determine on what kind of power they were to use. They had, in the previous year, formed a deputation from among themselves, to visit the different lines in the north of England, the counties of Northumberland and Durham being the only districts where the different systems of power were practised to any appreciable extent. It would appear that, notwithstanding the inspection by the deputation, they were yet unable to decide; and the only conclusion at which they arrived was, that owing to the great traffic anticipated on the new line, it would be impossible to work it by horses. This confined the question within narrower limits, locomotive and stationary engine power being the only systems available for choice.

To set the question at rest, two practical engineers were appointed to visit the Stockton and Darlington and Newcastle lines, and to report thereon.

The engineers chosen were Mr. Rastrick of Stourbridge, and Mr. Walker of Limehouse, who accordingly made a joint report on the subject, in March, 1829.

To be continued.

On the Application of Iron to Railway Structures.

Proportion of Load to Breaking Weight in Girders.—There appears to be a considerable difference of opinion as to the proportion between the greatest load which a girder should be allowed to bear and the breaking weight. There are two conditions under which the weight may be applied, viz: first, when stationary, as in the case of water tanks, floors, etc.; second, when the weight moves so as to cause concussions and vibrations, as in railway bridges. In girders required for the first case, Mr. Fox and Mr. T. Cubitt considered that the breaking weight should be three times the greatest load; Mr. P. W. Barlow four times; and Mr. Glynn would not make it less than five times the load.

In girders for railway bridges, Mr. Brunel states that he allows the load to be one third or two fifths of the breaking weight; but he considers that the rule he adopts for calculating the dimensions of his girders gives more than the usual strength. Messrs. Grissell and Charles May consider one third to be sufficient; Messrs. Rastrick, Barlow R. Stevenson and Joseph Cubitt adopt one sixth; Mr. Hawkshaw prefers one seventh, except in cases where great care is exercised in the selection of materials and workmanship, when a smaller proportion would suffice; and Mr. Glynn considers that in structures exposed to concussion and vibration the ultimate strength of a girder should be ten times the greatest load.

Tests for Girders.—The general opinion as to the amount of test which should be applied to girders, is that the test should amount to twice the greatest load. Mr. Joseph Cubitt would employ three times the greatest load, or half the breaking weight; and Mr. Thomas Cubitt considers it safer to test a girder almost to the extent that would break it than not to prove it at all, as the testing of girders is the only means of discovering defects under the surface, and concealed from the eye. Mr. Brunel, however, thinks that a girder should not be tested with a weight exceeding the greatest load, as the object in testing is to ascertain the soundness of the casting, which may be judged of by its appearance under the load, and all risk of permanent injury should be carefully avoided. Messrs. Rastrick, Glynn and Joseph Cubitt recommend that blows be applied to cast iron girders when under the testing load. Messrs. Hawkshaw and Barlow consider that where actual weight is used, sufficient vibration is given to the beam by throwing the weight into the scales used in testing. It is stated that, for convenience sake, girders are usually tested by means of the hydraulic press; but Messrs. Fairbairn, Lock, Brunel, Joseph Cubitt and Fox prefer using actual weight, on account of the uncertainty as to the actual pressure the hydraulic press brings upon the girder; though the latter gentleman considers that all liability to error in the press is obviated by an ap-

* There were, at this time, five locomotives on the line; four built by Messrs. Stephenson & Co., of Forth street, Newcastle, and one by Mr. Wilson of the same place.

proved construction which he has adopted. Mr. C. May states that, as girders are bought at the lowest possible price per ton, the manufacturer is compelled to adopt the most convenient and not the best mode for testing them, or ten times his profit would not pay him for the experiment.

Loads on the Bottom Flanch.—It is admitted that the mode of supporting the roadway on the bottom flanch of a girder causes torsion in the girder, tho' Messrs. Rastrick and Locke do not consider that the strength is diminished by the pressure being so applied; and Mr. Stephenson does not consider the torsion is of sufficient consequence to be noticed. In order to guard against any ill effects which might arise from the torsion, Mr. Locke fits in transverse pieces of timber between the two girders which support a line of rails, chocked perfectly tight, and he ties the bottom web together with tension bars. Messrs. Fairbairn and Hawkshaw consider it would be advantageous to alter the form of girders to enable them to withstand the torsion. Mr. Fairbairn thinks the cross beams should either lay on the top flanch, or be suspended by hook bolts from the bottom flanch, in which opinion Mr. Glynn concurs. Mr. Hawkshaw would increase the top flanch of the girder, or would cast shoes or brackets on them to bring the bearing of the transverse joists close to the vertical web. Mr. P. W. Barlow has adopted a new form of bridge to avoid this torsion. Mr. W. H. Barlow observed considerable torsion in a girder without any top flanch. Fairbairn and Hawkshaw are of opinion that wooden cross bearers for the roadway are liable to increase the amount of torsion by bending; but Stephenson and Brunel state that wood is desirable as a cushion to prevent the noise and vibration which iron on iron would be subject to.

Length for Simple Cast Iron Girders.—The use of simple cast iron girders in bridges appears to be limited only by the power to make sound castings, which arises chiefly from the difficulty of pouring the metal equally, and the inconvenience of handling large masses. Rastrick, however, would not put any limits to the length. Hawkshaw considers that they may safely be made more than 50 feet long; in which opinion Fox and Grissell concur, but name 60 feet as the limit. Glynn, Chas. May and Joseph Cubitt would make them from 40 to 50 feet. P. W. Barlow, Fairbairn, W. H. Barlow and Stephenson state 40 feet as the limit; and Brunel names 35 feet, as he does not consider that sound castings can be ensured to a greater length. Fairbairn, however, mentions a girder in Holland 70 feet long cast in one piece.

Form for Simple Girders.—It appears to be universally admitted that the form resulting from Mr. Hodgkinson's experiments on the tension and compression of iron is that which gives the greatest strength; but the actual proportions are generally modified to suit the varying circumstances under which girders are employed. Stephenson sometimes makes the top flanch equal to the bottom one, usually in the proportion of 3 to 5, partly to obviate any risk from unequal cooling of the materials, and partly from the necessity of having a large top flanch to bolt the flooring to. In preference to using a single girder, Stephenson recommends two girders to be bolted together, with a baulk of timber between, to which the rail is fixed. Hawkshaw, Fox and Joseph Cubitt recommend that the top flanch be increased beyond the proportions given by Hodgkinson, in order to resist the lateral torsion. W. H. Barlow and Locke would use the arched form of girder whenever practicable, and the former gentleman says that straight girders have been in fashion, and consequently more used than practice actually required. Fox, in girders subject to dead weight only, would make the proportion of the top flanch to the bottom one as 1 to 6; but in railway bridges he recommends 1 to 4. Thomas Cubitt mentions that shoes or sockets, or any projections cast on girders, have a tendency to create flaws from causing the dirt to accumulate in those places, and he considers that the shape which will ensure a sound casting should be as much considered as the theoretical form of greatest strength.

Deflection of Girders, and Effects of Permanent Loads and Change of Temperature.—It is considered that girders should not deflect more than from one six-hundredth to one four-hundredth of their

length according to the form of the girder. It does not appear from the evidence that a weight equal to what a girder is constructed to carry, will, even if left on any length of time, cause the deflection of the girder to increase, unless subjected at the same time to considerable changes of temperature. Some experiments made by Fairbairn and Braidwood, show that iron loses a considerable proportion of its strength when heated to a temperature of more than 220° Fahr., and that it becomes uncertain below 32°. Clarke described the effect of the sun coming out and shining on the Conway tubular bridge for half an hour, to have been to raise the tube vertically one inch; and he mentions that at night, from the low temperature, the deflection was always greater than in the day time. Fox instances the effect of frequent and great changes of temperature on some short girders, 6 feet long, which support the hoods of the forges in his workshops. In the day time they are so warm that the hand can only just bear the heat: at night they become cold. The effect is to make the girders *swag*, and the swagging appears to be continually increasing. Some have attained as much as 3" deflection in the centre; but their strength does not seem to be impaired.

The general impression of engineers appears to be that the deflection caused by passing a weight at a high velocity over a girder is less than the deflection which would be produced by the same weight at rest; and the increase observed in many instances is attributed by Locke, Stephenson and Fox to the inequalities at the junction of the rails, or to the jerks of the engine. Hawkshaw, however, considers that the deflections would be increased, and has given some examples of a manifest increase.

P. W. Barlow has observed a slight increase, and W. H. Barlow, in reference to this subject, cites a curious phenomenon which he observed on a timber viaduct, viz: that with a heavy goods train at a low velocity, a certain amount of deflection was produced; but an express train passing immediately afterwards, with a much lighter engine, seemed to push the bridge like a wave before it.

Forms of Girders Beyond the Limits of Simple Cast Iron Girders.—The modes of construction which have been adopted by engineers for crossing spans beyond the limits of girders made of a single casting are very various; but the chief forms which have been adopted by engineers for girders of a compound nature in railway bridges may be classed under straight built girder of cast iron in separate pieces, bolted together; arched girders of cast iron; trussed girders; bow string girders; wrought iron box and tubular girders.

The **Built Girder** is formed of separate castings fitted closely at the joints and bolted together, and is entirely dependent upon the bolts for support. Mr. Grissell instances one of 120 feet span, and states that he should have no hesitation in making one of 200 feet span; but the engineers generally seemed to consider that other modes of construction disposed the material more advantageously. P. W. Barlow exhibited a new form of girder in separate castings for moderate spans.

The Arched Girder.—The cast iron arch is a mode of construction which all engineers concur in approving of, when not limited by considerations of levels or of abutments. Locke states that he would never willingly use cast iron in any other shape than that of an arch. W. H. Barlow has also adopted it where practicable.

The **Trussed Girder** is straight and of separate castings bolted together, assisted by wrought iron tension rods. The Dee bridge girder was on this principle. Stephenson caused an experimental girder to be made, to exhibit the effect produced by the tension rods, adjusted as they were in the Dee bridge girders, as well as the effect when adjusted to lie parallel with the bottom flanch and adjoining it; these experiments, in conjunction with some made by T. L. Gooch, show that the tension rods, though they do not, when acting at the angle, as they did in the Dee bridge girders, produce the full effect, yet that they add considerably to the strength of the girder. Rastrick and Fairbairn object to the trussed girder on account of the different rates of expansion in cast and wrought iron. Stephenson and Wild propose to obviate this objection by put-

ting the tension rod along the bottom flanch, and applying to it an initial strain of five or six tons per square inch, so as to cause the wrought iron to come into play as soon as any weight is applied to the girder. Fox approves of this arrangement, but he considers that a strain upon wrought iron tends to stretch the metal permanently, and that the tension rods would require to be tightened periodically, while Stephenson and Wild have concluded from their experiments, that with a less weight than ten tons per square inch, the elasticity of the metal is not affected. The measure of the strain upon the tension rods is the amt't they are actually elongated by screwing up. As a combination of wrot and cast iron, P. W. Barlow has proposed to cast a bar of wrought iron in the bottom flanch of the girder and not to make the bottom flanch so large. Locke, Stephenson and May consider that the different rates of expansion of the two metals would be an objection to it. Brunel objects to the use of cast iron in long spans, and its combination with wrought iron, and prefers a framing of wrought iron and wood.

Bowstring Girder.—Messrs. Hawkshaw, Glynn, W. H. Barlow, Locke, Fox and Joseph Cubitt are agreed in considering the bowstring form of girder, with a bow either of cast iron or wrought iron cells, and the tension rods of wrought iron, as free from any objections urged against other modes of combining wrought and cast iron. It is considered applicable under almost all circumstances, as the roadway can be suspended from the bow.

Box or Tubular Girders.—Fairbairn considers these girders the best for large spans, and from some experiments he made, considers them capable of resisting not only dead weight but also impact. Stephenson states that they are cheaper and more elastic than other forms for spans of more than 40 feet, and he recommends that the top should be made of cast iron to resist compression. Glynn and Locke mention that they have been used for steam engines for some time, and consider the plan sound. Brunel looks upon the introduction of wrought iron into the construction of girders as the most important step that has been taken for some time in engineering; and he considers that, with ordinary care, and with the improvements which have been introduced in the mode of riveting, the joints made by riveting may be as permanent, and in every respect equal to the other parts of the structure, and he does not consider oxidation or vibration can affect them. With respect to riveting, Brunel considers that two plates should be riveted together so as to ensure their not breaking in any part contiguous to the rivets or joints, because the rivets should not act as pins or bolts, but as clamps which, by pressing the plates together, produce an enormous friction. Clarke, however, who has made a good many experiments on the subject, does not appear to have obtained so close an union of the plates, as he states that they generally broke at the riveting. Hawkshaw has adopted wrought iron girders for large spans, because he considers the use of wrought iron more advisable than cast iron for large spans; the box form is adopted to produce lateral stiffness. Fox and Rastrick consider that a large structure, like the Menai bridge, must be subject to sudden extension and compression from the changes of temperature.

Suspension Bridges.—Stephenson does not consider suspension bridges applicable to railways except to very small extent; and he states that he has been informed that an engine and train passing over one at Stockton (which has since been replaced by a girder bridge) pushed the bridge like a wave in front of it. Brunel states that, under very peculiar circumstances, he once proposed a suspension bridge himself. Brunel considers that the lattice bridge is advantageous only under circumstances which would prevent materials of more than a certain length being procured. Stephenson objects that the compression cannot be carried thro' them, and that the base through which the strain has to be carried is not sufficiently broad. It is stated, however, that Sir J. McNeill has remedied the want of power to resist compression by introducing a cast iron top.

Best Form for Bridges Independently of Expense.—Messrs. Rastrick, Hawkshaw, Fox, P. W. Barlow, Glynn, Lock, Brunel and Cubitt, agree in considering that the best form for iron bridges of

large span is that of a cast iron arch. Grissell states that he considers a well made straight girder equally to be depended upon, but admits that the arch is the strongest form; and Fairbairn says that for spans beyond 70 or 80 feet he would prefer wrought iron tubular girders. Stephenson would use narrow wrought iron girders.

Action on Skew Bridges.—It does not appear that the deflection of girders is sufficient to cause oscillation in engines passing over skew bridges, by causing one side to be deflected to the full amount before the other. But Stephenson mentions that when the road has been in bad order, one wheel being on the solid angle of the brickwork, while the other was on the soft ballast, has caused considerable oscillation.

Effect of Impact and Vibration.—It is not admitted that the vibration caused by a railway train on bridges would injure the bolts or rivets of compound girders, if well made and strong in the first instance. Grissell gives them a large amount of surplus strength, as he thinks that when no greater strength of iron is put than is absolutely necessary, every jar must tend to loosen the joints, and he considers that vibration has much more effect on wrought iron than on cast iron. Fox states that he would not depend on a cast iron girder of separate pieces bolted together without strengthening it with a wrought iron tie bar, but the use of wooden sleepers interposes a cushion which does away with the vibration. W. H. Barlow mentions that with light engines he found felt very useful in diminishing vibration, but that with the heavy weights now in use on the Midland line any interposing medium is crushed out. Stephenson attaches no great importance to vibration, and has laid iron girders on brick without interposing medium; and the fact of old cast iron mill work having run for so long a time without breaking is cited by Hawkshaw as an instance of the apparently small effect of vibration. W. H. Barlow considers that the irregularities which exist on the road from uneven joints, etc., in the rails, is a greater cause of danger than vibration, and he mentions that, to experiment on the impact, he caused the rails to be whitewashed for a mile before the passage of a fast train of 12 carriages, and that the small imperfections in the joints caused spaces adjoining them of five inches in length to be left untouched by any of the wheels in the train.

Greatest Weights on Railways.—Mr. Hawkshaw states that locomotive engines are the greatest weights which can come on railways, and reckons 14 tons per foot lineal as the greatest weight for a single line of way. Fox, Fairbairn and Brunel, mention 14 tons. W. H. Barlow states that on the Midland there are engines on four wheels weighing 32 tons exclusive of the tender, but that that weight is too great for the permanent way, and that the rails are crushed and flattened by it. Stephenson and Locke state, 1 ton per foot lineal is the greatest weight which comes on a single line of rail.—*C. E. & A. Journal.*

What the English are Doing in the Way of Ocean Steam Navigation.

We have already had repeated occasion to refer to the gigantic enterprise the British Government has in hand to connect with a fleet of the first class the West Indies, Mexico, Brazil, and the Pacific. The main features of the plan are as follows:

There is to be a great trunk line of steamers—or as the Times well calls it, a "great steam bridge"—direct from Southampton to the Isthmus of Panama. Every fortnight, a first class steamer is to sail from Southampton by this line, stopping first at the Island of St. Thomas, which distance it will accomplish in about twelve days. In St. Thomas's Bay three branch steamers will be waiting; which receiving their respective mails, will instantly proceed on separate routes—one to Havana and the Gulf of Mexico—another to Porto Rico, Hayti, Jamaica, San Jago de Cuba, Honduras, Nicaragua, etc.; a third to the Windward and Leeward Islands, as far as Demarara.

The mail line steamer, having disposed of its branch mails, will steam on from St. Thomas's direct for the little town of Chagres, on the Isthmus of Panama. Here it will disembark its Pacific mails for transmission across the Isthmus; and receiving in return the homeward mails from the Pacific, will be ready for its return voyage.—

Steaming back to St. Thomas's, it will there find the three branch steamers, whose return voyages from the three above mentioned routes will be so arranged that they shall always (except in case of accident) arrive in time to give and take mails with the trunk steamers; then it will proceed direct to Southampton, bringing the Pacific mails, and the mails of the three foregoing West Indian routes. It is calculated that, by this system of direct Atlantic steamers, an accelerated communication of from twelve to sixteen days will be secured for all the ports concerned.

To correspond with these arrangements for the Atlantic side of America, it is in contemplation by the Admiralty, "to agree with the Pacific Steam Navigation company for a fortnightly mail to and from Panama and Valparaiso, in place of the present monthly steamer." This will bring Chagres, and consequently England, into closer approximation to the western coast of South America.

There is to be a monthly mail to Brazil, with an independent line of packets. "Starting from Southampton, the steamers will proceed to Funchal, Madeira; Santa Cruz, Tenerife; Porty Praya, Cape Verde; Pernambuco, Bahai and Rio Janeiro. From Rio Janeiro there will be a branch packet to Montevideo and Buenos Ayres."

The distance between England and the Brazilian ports, according to the preceding arrangements, will be as follows:—To Pernambuco eighteen or nineteen days; Bahia twenty or twenty-one days; Rio de Janeiro twenty-four or twenty-five days.—The Brazil line may be ready by August or September next. The sum of £240,000 per annum now paid to the West India Mail Company for the conveyance of the West India mails alone, will, it is understood, suffice to cover the expenses of the whole proposed system; besides which there will be a retrenchment of £30,000 a year now spent in maintaining of Her Majesty's brig between Falmouth and Brazil. All this, we may say in conclusion, increases the peremptory necessity of the great canal across Panama, which will sweep the little town of Chagres out of its present impudent littleness into nothingness.

Method of Protecting Iron from the Oxidizing Influence of the Atmosphere.

In the Exposition of Works of Art and Manufacture at Paris, there were there exhibited numerous articles manufactured in iron, covered with a kind of transparent vitreous coating, completely spread over the surface of the metal, like a varnish, and capable of affording a perfect protection against the action of the air, or any other oxidizing agent.—This appears to be an invention susceptible of many useful applications; for, whether the iron be in the state of a rolled plate or bar, or drawn into tube; whether it be cast into water pipes or into articles of the most elaborate form and design, as vases, and other ornamental works, it can be equally well endowed with this protective coating—it is also a matter of indifference whether the article be made of forge or cast iron. The following is stated to be the process employed in imparting to the iron the vitreous surface:—Firstly, the object, whatever its shape may be, is thoroughly cleansed by dilute acid, which serves to remove, from the metallic surface, grease, dirt, and every trace of oxide; this is important, for, if any foreign matter remain upon the surface, the perfect adherence of the fused glass will be effectually prevented, when that part of the operation is reached—after the action of the dilute acid, the work is to be well washed and then dried; when perfectly dry, it must be brushed over with a tolerably strong solution of gum arabic, which may be applied by means of a camel hair brush. Over the whole extent of the gummed surface, powdered glass of peculiar kind, is then sifted, and care must be taken to cover every part of the surface with this powder, otherwise the vitreous coating will be imperfect when the operations are completed. When thus prepared, the work is introduced into a furnace or retort, heated to 100° or 150° centigrade; and, thoroughly dry, it is removed to another furnace, where it is brought to a cherry red heat; the vitreous matter, which adhered to the gummed surface of the metal, now undergoes fusion—the progress of this stage of the process is ascertained by looking through a small opening (contrived for this purpose) into the heated chamber. When the fusion is complete, and

the glass seems to have flowed over the whole of the surface, the article is removed from the furnace and placed in a close chamber, from which the air is entirely excluded—here it is kept until it has cooled down to the temperature of the atmosphere. The vitreous compound, applied to the surface of the metal, consists of the following substances:—Powdered flint glass, 130 parts; carbonate of soda, 204 parts; boracic acid, 12 parts. These must be melted together in a "glass pot," and a fusible glass will be the result; when cold, this must be pounded with care, so that it may be reduced to a powder sufficiently fine to pass through a silk sieve. When thus prepared, it is ready to be applied to the surface of the iron, according to the method described above. If, after the first process, the coating of vitrified matter on the metal should prove not to be quite perfect, the manipulation must be repeated, a second coat of powdered glass being applied in the same manner as the first. It is, above all things, necessary that the vitreous matter which forms the coating should be quite free from foreign matter: for, if this be not the case, or if the surface of the object to be coated be oxidised or greasy, the coating of glass will not adhere, and the result of the operation will be, consequently, very imperfect. It is possible, by modifying this process, not only to endow the surface of any article made of iron with a colorless vitreous varnish or glaze, but, as glasses of different colors may be used with equal ease, an effect resembling enamel may be produced; and, as vitreous compounds of great fusibility may also be produced by merely varying the proportions or character of their constituents, it appears probable that this process may be applicable to works in other metals besides iron.—*Newton's London Jour.*

Review of the Iron Trade of France for 1849.

From the official returns of the iron manufacture in France, we find that great exertions have been made by the ironmasters to compete with England and Belgium, more particularly from the steps taken by government for the revision of the tariff, to allow of the importation of foreign iron and coal at reduced imposts. It appears that the total quantity of ore, from 98 mines, amounted to 30,078,129 quintals, valued at 18,080,000 frs., produced from 474 furnaces; 5,223,852 quintals of cast iron, from which was obtained 3,604,901 quintals of bar, sheet and other merchant iron. The total value of the iron produced is estimated at 138,931,832 frs., being more than double what it was 12 years since. Of the six different modes of manipulation in the iron manufacture adopted in France—the Catalan, Conitois, Wallon, Nivernais, Champenois and English, the latter method is most adopted, being about one-half of the whole quantity in the republic, and which is principally effected by coal and coke.—The working of the iron and coal mines in France, one of its chief resources, and the consequent returns have increased since 1830 to a great extent; at that period the quantity of coal supplied was 18,626,659 quintals, and in 1848, it had risen to 47,000,000, the importation of British and Belgium coal increasing the consumption in the latter year to 65,000,000 quintals. The production of cast iron affords similar results; in 1830, the quantity made was 2,663,608; in 1849, it exceeded, as seen above, 5,000,000; 1,484,685 quintals of wrought iron were produced in 1830, while, in 1849, the make amounted to nearly 4,000,000. The price, which in 1830 was from 36 to 40 frs. per 9 cwt. or quintal, in 1849 was selling at 26 frs., and is expected to be shortly down to from 23 to 25 frs. The collieries give employment to 69,340 persons, receiving as a return for their labor 44,770,554 frs. The iron manufacture occupies 17,803 persons, and the total estimated to be employed in quarries, coal, and other mineral works, is 297,126 persons receiving 434,308,729 frs. per annum.—*London Mining Jour.*

New Banking House in Boston.

It is understood that the new banking house to be established in this city, to transact the exchange business of the Barings, will go into operation about the 1st of Sept. The style of the firm will be Gilmore, Blake & Ward. The reputation of the first two partners, Adrian Gilmore and George

B. Blake for schrewdness and sagacity, is well established in this community. Mr. Ward is the youngest son of Thomas W. Ward, Esq., the Boston agent for the Barings for a long series of years. Mr. Ward, Jr., will doubtless bring to the banking house, good ability, family influence, and a very desirable foreign connection. Mr. Gilmore will probably retain the Presidency of the Western railroad till the annual meeting of the corporation in February next. It has been stated that the new firm will commence operations with a cash capital of \$250,000, and it is well known the parties have at command at least as much more.

Mr. Gilmore is at present in England, and it has been intimated that in addition to the usual business of bankers, the new firm will probably act as agents for European establishments for the sale of rails and other articles, for the furnishing and equipment of railroads. The establishment of so extensive a house in our city, is of more than ordinary interest, and but few firms have starved under more favorable auspices.—*Boston Correspondence of the Newburyport Herald.*

Maryland.

Baltimore and Ohio Railroad.—The revenue of this work, for the recent month of May, shows an increase of upwards of \$9,000 over the corresponding month of 1849. According to a statement in the Patriot, the items of revenue are:

	For passengers.	For freight.
Main Stem.....	\$33,177 36	\$72,840 39
Washington branch....	24,543 72	4,240 69
	\$57,721 08	\$77,081 08

Making an aggregate of \$106,017 75 on the main stem, and \$28,784 41 on the Washington branch—the total being \$134,802 16. This shows an increase over the corresponding month of last year of \$4,390 80 on the main stem, and \$5,007 48 on the Washington branch—making together \$9,398 28.

In reference to the important matter of the extension of the road westwardly towards the Ohio river, we learn from the same source that at a meeting of the board yesterday, the remainder of the road from the Tygart's Valley Bridge to the city of Wheeling, was let to contractors, with the exception of about 35 miles, which await the decision of the board of arbitrators, to be made by the 1st of October next. The bidding was spirited, and the estimates of Mr. B. H. Latrobe, the Engineer, fully sustained throughout. The work will be commenced without a moment's delay. The whole line of this great work may now be said to be in the hands of contractors, and at prices below the original estimated cost.

The laborers now employed number upwards of 2500, and the monthly estimates will, when the whole line is under way, exceed \$100,000. Considerable progress has been already made upon all the heavy sections; several of medium class are very nearly, and some entirely finished. The great tunnel is progressing steadily, and with every prospect of completion within the time limited by the engineer.

The laying down of the iron will commence early next spring. The road to the mouth of Savage may be expected to be opened about June next, and the track will thence be pushed forward without interruption, and in an unbroken line until it reaches Wheeling.

The iron is now arriving in large quantities at the company's wharf at Locust Point, upwards of 2000 tons having been received in the last month. This iron is of excellent manufacture, and will compare favorably, as to cost, with any that has been imported. The recent sale of the company's bonds which were given in payment for the iron, has been made in London by the Messrs. Barings, at 108 per cent., a gratifying evidence of the confidence which capitalists have in the work, and the gentlemen who have charge of it.

Tennessee.

General estimate of cost of completion of East Tennessee and Georgia railroad from Dalton, Ga., to Knoxville, Tenn., from 4th April, 1850, the date of Gen. Green's abandonment of his contract.

From Dalton to the Hiwassee River, 40 miles.

Grading and superstructure, including the furnishing of the timber and laying down track.....	\$90,000
Depots, water stations, engine houses, &c.....	10,000
Iron rails, chairs and spikes.....	180,000
Road furniture, including engines, cars, &c.....	44,500
Add superintending, contingencies, &c.....	15,500
Total.....	\$340,000

From Charleston to Blair's Ferry, 40 miles.

Finishing and repairing grade.....	\$20,000
Iron rails, chairs and spikes.....	180,000
Timber and track laying.....	36,000
Road furniture.....	35,000
Depots, &c.....	10,000
Add superintending and contingencies.....	9,000
Total.....	\$290,000

From Blair's Ferry to Knoxville, 30 miles.

Grading, masonry and bridging, including bridge across Tennessee river...	\$280,000
Iron rails, chairs and spikes.....	135,500
Timber and track laying.....	25,000
Engineering, etc.....	9,500
Road furniture, including depots, etc....	33,000
Add for contingencies.....	17,000
Total.....	\$500,000

Abstract of foregoing Estimates.

From Dalton to Charleston.....	\$340,000
Charleston to Blair's Ferry.....	290,000
Blair's Ferry to Knoxville.....	500,000

Total cost.....\$1,130,000

Account of the means of the East Tennessee and Georgia Railroad Company.

State loan of \$350,000 in 6 per cent. bonds at 106.....	\$364,000
State 5 per cent. bonds to be paid Wm. Grant & Co., per contract at par.....	45,000
Unexpended of 5 per cent. bonds \$63,000 at 85.....	53,550
Stock of company to be paid William Grant & Co., per contract, at par....	45,000
Total cash means.....	\$507,550

Required for completion of road to Hiwassee river.....	340,000
Amount at command for extension to Knoxville.....	\$167,550
Estimated cost of extension to Knoxville \$790,000, say.....	800,000

Amount to be raised on stock subscription.....	\$632,450
Of this amount it is safe to assume 15 per cent can be taken by contractors.....	94,868
Remainder.....	\$537,582
To this add floating debt of company, say.....	37,418

Amount of stock to be raised by citizens.....	\$575,000
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We are informed that Dr. Ramsey, the agent of the State for disbursing the loan to the East Tennessee and Georgia railroad company, will probably leave for the north during the present week to make arrangements for purchasing iron and equipments for that section of the road between Dalton and the Hiwassee river.—*Knoxville Register.*

Georgia.

Waynesboro' Railroad.—It will be seen by reference to another column, that the directors of the Waynesboro' railroad advertise to receive proposals for the grading, masonry, bridging and superstructure of the northern division of this road. This part of the road, extending from Waynesboro' to

Augusta, is about thirty miles. The southern division, or that part lying between the Central railroad and Waynesboro', has already been contracted for, and it is now being built.

We are pleased with the energy with which the President and directors are pushing forward this great work. Savannah has never engaged in an enterprise which affected more vitally her general welfare, or one in which her citizens felt more personal interest.—*Sav. Rep.*

Michigan.

The Michigan City News has the following paragraphs concerning the rival railroads centering at that place:

Michigan Central Railroad.—The grading and bridging between New Buffalo and this place is about completed, and the road is ready to receive the iron, which is expected about the 1st of July. The road will probably be in readiness for the cars by the first of August.

Southern Railroad.—It is reported by the engineers employed on this road, that the contracts for grading said road from this place to the Illinois State line will be let in a few weeks.

New Hampshire.

Manchester and Lawrence Railroad.—We learn that the two thousand shares of preferred stock offered to the stockholders of the Manchester and Lawrence railroad have all been taken. The stock is guaranteed four per cent. annually, until the whole net earnings are sufficient to pay eight per cent. per annum, and then to be merged into one stock. The stockholders have from July to January to pay for this new stock. The present capital is \$250,000; this addition of stock will increase it \$500,000—total \$750,000, the whole capital for the road, which is twenty-six miles long. We understand that this arrangement pays for the entire cost and equipments of the road.—*Traveller.*

New Railroad Project.—We learn that a party of engineers are engaged in surveying a route for a railroad from Dracut, Mass., to Derry, N. H.—The proposed road is to start from some point near the Central Bridge in Dracut, pass up the left bank of the Merrimack to the mouth of Beaver Brook, thence up that stream or near it through Dracut, Pelham, (N. H.) and Windham, to the line of the Manchester and Lawrence railroad in Derry. Mr. Peter Lawson, of Dracut, we understand, is largely engaged in the enterprise; and we should not be surprised to have to record that the railroad was in the hands of the builder, within one year from this date.—*Lowell Cour.*

Massachusetts.

Midland Railroad.—At a called meeting of the corporators of this company, in this city, on Saturday, Robert Codman, presiding, and E. W. Ammidown acting as Secretary, it was voted to accept the act of incorporation passed at the last session of the Legislature.

Messrs. Farnum, Ammidown and Dunham, were appointed a committee to nominate a ticket for directors for the ensuing year, and the following named gentlemen were unanimously elected:

James M. Bunce, of Hartford, (President of Willimantic and Thompson railroad;) H. N. Slater, of Providence, (President of Southbridge and Blackstone railroad;) E. W. Ammidown, (President of the Norfolk County railroad;) Marshall P. Wilder, of Dorchester, Welcome Farnum, of Blackstone, Robert Codman, Henry K. Horton, Joseph W. Ward, Thomas Richardson, Samuel S. Perkins, Isaac Adams, and Francis Brinly of Boston.

Messrs. Codman, Ammidown and Ward, were appointed a committee to prepare by-laws for the corporation.

Mr. Ammidown stated with much satisfaction, the legislature of Connecticut had empowered the city of Hartford to loan its credit to the Hartford and Willimantic road to the amount of \$500,000. The meeting then adjourned to Saturday next at 3 P. M.—*Bos. Cour.*

Ohio.**Cleveland and Toledo Railroad.**

At the stockholders meeting of the Junction railroad company, for the election of officers, held at Elyria, on Friday last, the following named gentlemen were elected directors, for the ensuing year: Seymour W. Baldwin, Elijah DeWitt, Raymond Starr, Nahum B. Gates, Robert McEachron, Herman Ely, Jr., Orin Cowles, and Artemas Beebe, of Elyria; David Hamilton, of Milan; Alexander M. Porter, and Ebenezer Lane, of Sandusky; and John A. Foot and Herman B. Ely, of Cleveland.

A meeting of the directors was held subsequently; and Hon. Ebenezer Lane was chosen President, and Elijah DeWitt, Secretary and Treasurer. Means are already provided for the preliminary surveys; and the President has been instructed to put a corps of engineers on the route immediately. Committees are appointed to ascertain the amount of subscription, which can be procured along the line. They will make efficient work of it. There is every indication from the determination now manifest of the inhabitants through the region which it must pass, to have a road, that the requisite amount will be raised, and the work pushed forward without unnecessary delay.—*Cleveland Herald.*

Ohio.

Cleveland, Sandusky and Toledo Railroad.—We notice that our neighbors of Elyria and Sandusky are moving in this matter. Last Saturday, pursuant to notice given by the gentleman named as commissioners in the act of 1846, incorporating the Junction railroad company, the books were opened for subscriptions at Elyria, and the amount requisite to effect the organization of the company subscribed. A meeting of the stockholders is called for the 7th of June next, for the choice of directors, and to adopt measures to push forward the work immediately. It is understood that this company possess all the property and rights of the old Ohio railroad company, west of Cleveland; and that a part of the located line of that company, some small portions of which are already graded, will be adopted by this company.

Though aware that the movement has been in contemplation for some time, we have waited hopefully to see this last link in the chain of railroad communication from New York and Boston to Galena, filled up; and the work pushed forward on all the sections yet incomplete, simultaneously.—Our expectations are now beginning to be realized. The Southern Michigan road, terminating at Toledo, and the Mad river and Cincinnati road at Sandusky, know the importance of the early completion of this road. There is every assurance, that the sound of the axe and clink of hammers will not cease to be heard, until the whole work is complete.—*Clev. Herald.*

Georgia Railroad.—The following is a comparative statement of the business of the Georgia railroad for the month of May, 1849 and '50.

	Passengers.	Freight, Mail, etc.	Amounts.
1850....	\$15,503 05	\$28,991 55	\$44,494 60
1849....	11,457 09	18,401 39	29,856 48
Increase.	\$4,045 96	\$10,590 16	\$14,636 12

Michigan.

Michigan Southern Railroad.—The Toledo Blade says—"We learn of a gentlemen from Coldwater that about one half the grading on the Southern railroad, between Hillsdale and Jonesville, is already completed, and the remainder will be by the 30th inst. The timber is already on the ground for laying the track, which will be ready to receive iron in time for its entire completion, by the 4th of July. There are two hundred laborers at work be-

tween Jonesville and Coldwater. It is said that this section will be ready for the iron by the 1st August. Our cars will run to Coldwater early enough in the fall to give us the benefit of the entire fall trade. With reasonably good wheat crops, there is no reason why we should not have a very active trade from this direction.

Kentucky.

The railroad track between this place and Lexington is now in fine order and the cars are running through, twice a day, in perfect safety, and making the distance in very good time. We passed up on them some days ago, and were gratified to see the number of passengers both going up and returning.—*Frankfort Yeoman.*

A Useful Contrivance.

The Detroit Tribune gives a description of a machine invented by Mr. Brooks, superintendent of the Michigan Central railroad, recently added to the conveniences of the large Depot at Detroit. The Tribune says the contrivance resembles a treading mill in an upright position, the top of which projects about one foot above the floor of the upper story, and the bottom the same distance below the ground floor. From what would be called the revolving floor or bed (were it a treading mill) project four pairs of arms equi-distant from each other, or about ten feet apart. The barrel is rolled against this revolving bed, and as a pair of arms come up from beneath the floor, the barrel is taken and carried into the story above. Immediately on arriving at the top of the bed, its momentum carries it on an inclined plane, and it rolls away to the side of the room. Thus it unloads itself, and only needs one person to feed it below. It is said to save the labor of five men. It has been operated for a few minutes so as to hoist at the rate of one thousand barrels an hour. The bed commonly makes three revolutions per minute, carrying four barrels at each revolution, or 720 barrels per hour. It is operated by the same engine that is used for hoisting the grain.

New York.

The annual election of the Albany and Schenectady railroad company was held on Wednesday last at Albany, when the following gentlemen were chosen directors for the ensuing year:

John T. Norton, Ezekiel C. McIntosh, Rufus H. King, Herman Pumpelly, Lyman Chapin, Augustus James, Garrit Y. Lansing, of Albany; Thomas Tileston, Richard H. Winslow, of New York.

At a subsequent meeting of the board, John T. Norton was elected President, and Ezekiel C. McIntosh Vice President. The board unanimously resolved that the construction account on the books of the company should be finally closed on the 1st of August next, the floating debt funded immediately, and that henceforth the revenues of the company should be strictly applied to the repairs and running expenses of the road, interest on the debt and to the payment of regular semi-annual dividends to the stockholders, reserving a suitable contingent fund. The business of the road since 1st January shows a handsome increase on last year, and it is still increasing. It is understood that a dividend of not less than 3½ per cent. will be declared next month; and that the net earnings for the present year will be considerably over 8 per cent.

The Buffalo Republican says: "We understand that the directors of the Buffalo and Attica, Tonawanda, Auburn and Rochester, and Syracuse and Utica railroads have passed resolutions authorizing a committee appointed by each road to immediately subscribe 5 per cent. on their capital stock to the Buffalo and State Line road. This amount, in connection with the subscriptions of individuals, makes an available capital of over \$500,000—sufficient to insure the immediate completion of the road to the State line. It is expected that the Albany and Schenectady, and Schenectady and Utica roads will also subscribe 5 per cent on their capital stock. A meeting of the different committees will be held in this city in a few days to complete the subscription."

From the Boston Shipping List.**Comparative Statement of the California Trade, Commencing January 1, 1849 and 1850, to Date.**

	Clearances for California						Vessels Arrivals at now California. up. 1849. 1850.		
	Ships.	Barks.	Brigs.	Schoon-ers.	Steam-ers.	Tot'l 1850. 1849.			
Boston.....	32	37	23	19	..	111 53	10	1	45
New York.....	47	30	21	10	13	121 141	24	9	36
Baltimore.....	12	7	6	9	1	35 24	..	..	8
Philadelphia.....	7	10	2	6	..	25 12	6	..	12
New Orleans.....	9	7	4	4	..	24 10	5	..	8
New Bedford.....	6	6	2	..	..	14 18	..	2	12
Salem.....	..	..	4	3	..	7 5	1	2	7
Nantucket.....	..	..	1	1	..	2 7	..	..	4
Bath, Me.....	..	..	2	2	..	4 ..	..	..	8
Portland, Me.....	1	3	..	..	..	4 ..	..	..	8
Bangor, Me.....	..	..	..	..	..	.. 2	..	..	3
Eastport, Me.....	..	..	..	..	..	.. ..	..	..	3
Providence, R. I.....	..	..	2	..	..	9 2	..	..	4
New London, Conn.....	1	1	1	3	..	6 6	..	..	7
Other ports in Massachusetts.....	1	3	1	1	..	6 7	..	..	11
Other ports in Maine.....	..	3	3	1	..	7 1	..	..	7
Other ports in Connecticut.....	1	..	..	3	..	4 6	..	1	6
Other ports in Rhode Island.....	..	..	1	..	..	1 5	..	..	1
All other domestic ports.....	7	7	8	4	..	26 8	..	..	16
Great Britain.....	30	..	..	..	..	30 10	7	1	8
France.....	5	..	..	..	..	5 2	..	..	4
British Provinces.....	2	4	4	..	..	10 1	1	..	2
Sandwich Islands.....	1	1	1	..	..	3 ..	3	1	23
Other foreign ports.....	8	12	4	1	3	27 6	1	2	135
Total.....	170	131	89	67	17	474 325	56	19	378
Total number of vessels which have sailed from the United States for California:									
Ships.	Barks.	Brigs.	Schoon-ers.	Sloops.	Steamers.	Total.			
379.	343.	264.	207.	2.	65.	1297.			

Remington's Bridge.

The bridge which Mr. Remington has been building in this city, and which has excited much curiosity and speculation, was completed on Saturday and the scaffolding knocked away, under the direction of Mr. Remington, in the presence of a large concourse of people, and among them many doubting Thomases. The result was most triumphant for the inventor.

The beautiful structure, apparently too fragile to sustain its own weight, proved all that had been claimed for it. It was immediately put to the severest test. Hundreds of people passed over it, and it was conceded by the most sceptical that it would stand and answer all practical purposes. The bridge, which at a little distance resembles a slight ribbon or shaving of wood extended over a ravine beneath, four or five hundred feet in length, tho' looking as if it would not bear the pressure of a bird, is found to endure immense weight, in fact, it appears all that can conveniently be placed upon it. It is without hand rails, 436 feet span, 10 feet wide. The planks, which are at the abutments about six inches thick, fine away at each end towards the centre, to about one inch or an inch and a half, and are firmly joined by an impervious cement, the invention of Mr. Remington. The principle is regarded as eminently successful, and in all sections where lumber is a matter of moment, must prove of incalculable value.—*Alabama Journal*, June 10.

AMERICAN RAILROAD JOURNAL.

Saturday, June 22, 1850.

Ray's Patent India Rubber Car Springs.

Savannah, Ga., May 22, 1850.

FOWLER M. RAY, Esq.,

Dear Sir: I have no hesitation in saying, after having used on our road your springs and Fuller's, that I consider yours decidedly the best in every particular, and in this opinion I am sustained by all our officers. Fuller's spring has a tendency to split, and also to chafe or abrade by the constant friction on the cast iron plates or disc: and in my opinion is not near so elastic as yours.

Your springs, which have been in use on our road for 12 or 15 months past, and in constant use under both passenger and freight cars, are to all appearances as elastic, sound and good, as when first put in use.

We are now building eighty-five new cars, of which for fifty-sets the springs have been ordered of you.

GEORGE A. ADAMS,

Master Carpenter,

Central Railroad and Banking Co. of Georgia.

Connecticut River Railroad Office, }
Northampton, May 4, 1850. }

E. CRANE, Esq.,

Dear Sir: It is now about two years since I first tried the experiment of using a set of Ray's India-rubber Springs upon one of our merchandise cars, and although the car has been in constant service since that time, I do not on examination find the slightest difference either in the thickness or elasticity of the material.

The same result has followed wherever we have applied them, either for wheel or draw springs on Engines, Tenders or Cars. At present we use no other; either in replacing old springs or building new cars—and I am perfectly satisfied that for economy, durability, safety, and ease of motion, that Ray's India-rubber is the best article for Springs which has been presented to the public.

Yours respectfully, J. HUNT,
Supt. Connecticut River Railroad.

EDWARD CRANE, Esq.,

Dear Sir: Having applied to cars of the Boston and Worcester Railroad Corporation, Ray's Vulcanized Rubber Springs (where they have been in use for some two years last past), I have had occasion to observe their operation, and am free to say in answer to your inquiries, that they retain their elasticity perfectly during all changes of atmospheric temperature: and are in my opinion a most valuable acquisition to Railroad Cars—are not liable to derangement, as is the case with steel springs; while at the same time it costs less to apply them. Respectfully yours,

D. N. PICKERING,

Supt. Motive Power, Bost. & Wor. Railroad.
Boston, April 15th, 1850.

For the American Railroad Journal.

New England--Her Factories and her Railroads.

The recent depression in the price of New England factory and railroad stocks has, as we apprehend, a signification which should arrest the attention of her statesmen and capitalists. On the roads there has been no diminution of travel, and altho' the stock has not always been paid in full, and the companies have been in the money market as large borrowers, yet there has been no apparent lack of capital which would have sought investment in these shares or bonds had there been an entire confidence in the future dividends.

According to Mr. Lawrence, the first class factories in Massachusetts and New Hampshire have, for a series of eleven years, paid average dividends of nearly 9 per cent per annum. This interest on capital is large. It is an average of 3 per cent. at least, beyond the ordinary use of capital which is invested by large holders in this country. Yet the stocks of these same factories are at a heavy discount. This depreciation must be the result of a lack of confidence in the future capacity of these cotton mills to pay nine or even six per cent. dividends.

Does this lack of confidence grow out of the unprofitableness of the business itself, or the fear of a vacillating policy in the government on the tariff question, or does it indicate a fear that New England is not the district where manufactures can be carried on with the most economy and profit, where population will be most concentrated, and where railroads will be in the greatest demand as the instruments of a dense population, busy in exchanging commodities with each other and with strangers?

That the business of working up cotton, wool and iron in this country is, in itself, to be unprofitable, we cannot believe. We are too far advanced in civilization to warrant the belief that we shall discontinue those branches of industry by which that civilization has been measured. We cannot retrograde, and become a purely agricultural people. As to the changes and fluctuations in our tariff policy, we can see no reason to dread greater fluctuations for the next twenty years than have occurred in the last twenty years; and certainly, compared with the condition of manufactures of twenty years ago, the present manufactures stand on vantage ground. There is now more capital by far, vastly more experience, and more facilities of disposing of goods.

Is there not, then, an apprehension in the minds of capitalists and manufacturers that, neither in New England nor on the seaboard is to be the chief seats of manufacturing industry? Is it not perceived that the population of the Eastern States, at least in the manufacturing districts, has become already too dense for the subsistence capacity of the soil, and have not the instruments as well as the food of those districts become too costly?

As was suggested in a former number, the railroads from the ocean to the rich lands and minerals of the interior, and that they were made to bring the materials and food to us, and to carry the fabrics from us, have brought the producers and consumers so near together, and have so nearly made an equilibrium in the conveniences and luxuries of life, that men are now more than formerly disposed to leave the rugged hills and narrow valleys of the East for the wider and more fertile plains of the West; to sell high priced and buy low priced lands; and to move, once for all, the tools and the mouths

to the materials and the food instead of being at the yearly cost of moving the latter to the former.

If such are the natural tendencies, and if such are to be the results, would it not be wise in our New England friends to make a corresponding change in their action. The price of land is a matter of but little moment, when compared with the cost of subsistence. New England has made wonderful accumulations of money, capital and wealth in the form of mills, houses, roads, etc., but this has been the result of the profits of labor employed in working up foreign materials for foreign merchants, and by incorporating therein the food grown at home. Now it seems to be a question whether the current profits of this district are not absorbed in transporting heavy and bulky food from a great distance.

The remedy seems as obvious now as when capital of Boston and Salem was so largely transferred to the India trade and to commerce between New York and Calcutta and Canton. Mr. Cushing cannot, certainly, make both ends meet by the profits on fruit, flowers and stock from his princely estate at Waterton: he is not the less useful to his State, because he made his wealth abroad and liberally spends his income at home; but the man who toils hard in the Middlesex mills, and loves earth and trees as well as Mr. Cushing, cannot afford to satisfy his longings in Waterton, or if he does, he must ask a price for his labor that the Lowell mill owners cannot afford to pay.

Let the capitalists then build more mills abroad where land and food and materials are to be had at less cost. If need be, let them send abroad their coarse machinery that requires common laborers at low prices, and let these laborers follow if they cannot learn the use of finer tools; let high priced goods be made by high priced labor to support high prices of food and land. Then, it may be, all will again go well. But to us it seems anomalous that an increase of the coarsest work should be made where everything also indicates the highest skill and the most expensive labor and instruments of labor.

SCIOTO VALLEY.

We agree with the writer of the above that it would be for the interest of a portion of the New England manufacturers to transfer the scene of their operations to the valley of the Mississippi, as in such an event, they would more readily supply that market, and save the cost of transportation, both of their fabrics and food for the support of their labor. To supply the wants of this great valley would require an immense amount of machinery, and for new investments in this country we believe the west to be the best field. Still we believe, that at the present time, cotton cloths can be manufactured cheaper in New England than in any other part of the country, for the reason that we find there a more dense population, greater industry, a harder race, greater mechanical skill and ingenuity, and a more perfect education of all classes than in any other part of the country. At present, we believe these necessary conditions of cheap production, overbalance the superior advantages in other respects of other portions of the country. This advantage is not likely to be overcome for some time. For foreign commerce, the western manufacturer will hardly ever be able to compete with the New Englander. The success of the former will be limited at present at least to a monopoly of his own district.

The stocks of Massachusetts have been very much depressed from over investment of all kinds.

At present the cotton mills are doing a poor business, in consequence of the high price of cotton and the low price of the fabric. But this evil will soon correct itself. But that this great interest is likely to be depressed permanently we do not believe.—People must wear cotton cloth, and they must pay somebody what it costs to manufacture it, and every part of the country, and the world, will find in the New Englanders, rivals by no means to be despised. They possess more of the conditions of cheap manufacturing than can be found in the United States at least. The west may acquire this ultimately to a greater extent, but it must be a work of time.

The profits of manufacturing in New England are by no means to be measured by the present price of stocks, or by the profits received by the manufacturer. Just look at the cities that the cotton mills have built up, having aggregate values of millions, in which the manufacturer has no interest whatever. Here are seen the profits of manufacturing; and these cities still grow rapidly, notwithstanding the temporary depression which now rests upon the whole country.

Free Railroadings.

New York has given to the country two good examples in her banking and her general railroad laws. By these, any number of persons may build as many railroads in any direction as they may choose. A company has the same liberty to build a railroad as a steamboat. The Legislature looks upon such persons as the best judges of their own interests.

If every State would adopt the same principle, it would be an immense advance upon the present systems in use. In all the States where charters are granted by the Legislature direct, as soon as one set of men obtain a charter, they are governed merely by their own interests, and naturally oppose all other charters which conflict with their own. Where there are a large number of companies, a combination of them is often able to control the Legislature of a State, and withhold what may justly belong to a particular section, or body of men. From the opposition thus encountered, railroad charters are in many cases obtained only at great cost and expense, which materially add to the cost of a line, and is the source of no little bribery and competition. The Parliamentary cost of many leading English lines have been greater than the entire cost of many of our roads, and this has been one of the causes of the great depression suffered by their roads.

All these evils can be avoided by making free the right to build these works. Neither would there be half the danger of pushing these works to an injurious excess, as under the old system.—Those engaging in their construction would simply consult their own interest, and would not be influenced by any other motive. The construction of these works would go on naturally as any other pursuit which is alike open to all.

North Carolina.

Central Railroad Stock all Taken.

The stock of the North Carolina Central railroad has all been subscribed for, and five per cent. the first instalment required by the charter, paid in on the whole amount of one million dollars. The fact of the completion of the subscription was ascertained at the meeting of the general commissioners at Chapel Hill last week.

A meeting of stockholders, for organization, etc.,

has been called for the 11th of July, at Salisbury, (according to act of incorporation.)

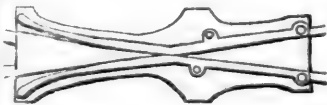
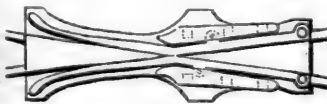
German Railway Car Headings.

We have examined at Doremus & Nixons, No. 39 Nassau street, some of the most beautiful specimens of these goods which we have ever seen.—That house has had for some time past an agent in Germany for the purpose of introducing these goods into this country, and we have no hesitation in saying that they are superior to anything of the kind for sale in the market. The body of the goods are of the finest description, and the figures, which are printed upon satin and silver ground, are of the most tasteful styles, and beautiful finish. In fact we have seen nothing equal to them, and we would recommend them to the attention of car builders, who can, with these trimmings, at a very slight additional expense, offer a much more attractive and saleable article to their customers.

New Invention.

Improved Railroad Frog.

We have been shown a model (of which we have annexed cuts showing the different parts of it,) of an improvement upon the Frog now in use on railroads. It entirely relieves the Frog from the wear to which it is now subject, and removes all danger of getting off the track when these occur. The great expense of keeping the Frogs in order, and the accidents which are constantly occurring upon roads, renders this improvement one of the great desiderata on all railroads. It has been in successful use in Pennsylvania, and we have seen certificates of the engineers and superintendents of some of the leading roads in that State, which speak of the improvement in the highest terms.—Below are annexed cuts, which will readily illustrate the invention. A model may be seen at our office, or at the American Institute.



Rhode Island.

Railroad Meeting at Providence.—A large and enthusiastic meeting of the most substantial citizens of Providence assembled on the 10th instant, to devise means for the speedy building of a railroad from Providence to Willimantic, to connect with the Hartford, Providence and Fishkill railroad. The Providence Post says:—"There was a degree of interest manifested in the enterprise, which promised to atone for our past neglect in a matter of such serious moment to our business interest." A resolution was passed, providing that

books be opened for the subscription of stock, under the charter already granted by the Legislature of Rhode Island. Twenty-four gentlemen of Rhode Island and Connecticut were appointed to carry the resolution into effect. This committee is authorized to call a meeting of the stockholders whenever one thousand shares are subscribed. Extracts from the reports of Mr. Lourie, who had been engaged to survey the route were read. It appeared that the estimates were favorable, statistics showing him the amount of manufacturing, travel, and general business of the line of the proposed road, were also read. A committee was appointed to confer with the directors of the Hartford and Willimantic, and the New London and Providence roads, with reference to the necessary connections. Subscription books were offered at the meeting. One gentleman, Alexander Duncan, Esq., subscribed thirty thousand dollars.

Rouse's Point and St. Johns Railroad.

The contract for building the railroad from St. Johns to Rouse's Point, a distance of twenty-four miles, has been let, and working survey will be made early this week. Henry Campbell, Esq., is the contractor. He has agreed, says the St. Albans Messenger, to complete the road during the present season.

Baltimore and Susquehanna Railroad Depot.

The depot erected for this company, on the square of ground between North and Calvert and Franklin and Centre streets, has now approached so near to its completion as to enable the company to use it for the reception and despatch of passenger trains.

The depot, for spaciousness, convenience, and adaptation to the purposes for which it is designed, will compare most favorably in every respect with any in the United States. In its construction a substantial strength and solidity have been combined with a beauty of architectural style which does great credit to the taste and skill of the architects from whose bureau the designs came, Messrs. Niernsee and Nelson. The front on Calvert street, we think, may justly be considered a most imposing and appropriate piece of architecture. The beautiful brown free stone, extensive quarries of which exist on the line of the railroad, has been introduced into the building with great effect. We are glad to see that this initiative has been followed, and that in improvements in different parts of the city this attractive and excellent building material is being largely used. The depot has been constructed to meet not only the present wants of the road, but those which will be consequent upon the largely increased business which may confidently be expected to seek our city through this avenue; and the President and directors of the road, in thus providing, with an enlightened and liberal policy, for the future, are deserving of the commendation of the community.—*Baltimore American.*

Commercial Street, Portland.

A fine business avenue with the above name, is about being opened in the chief city in Maine. It will be about a mile and a quarter in length, connecting the eastern and western depots, with a track running the whole distance. Its width is 100 feet, part of the way 130, with a solid sea wall on the lower side, capped by a granite sidewalk. It crosses nearly every wharf in the city, leaving about 50 to 100 yards of each dock above it. These

spaces will soon be filled, furnishing fine locations for warehouses fronting the water like those on the western rivers. Tracks will lead down most of the wharves, and the large business already in part pouring in over the northern and eastern roads, will be distributed through the commercial part of the place. The city extinguish the land claims, and pay all damages for buildings removed, one of which is the only distillery; and the Atlantic and St. Lawrence and Boston railroads build the street, at a cost of perhaps \$100,000, furnishing a large station house, where the broad and narrow gauge cars will meet and transfer their passengers. It is a spirited undertaking.—*Journal*.

Pennsylvania.

Ohio and Pennsylvania Railroad.

The prospects of this work, so vitally important to the interests of Pittsburgh, are highly flattering, and the force employed upon the line is constantly increasing. The lower portion of the new county road is already in use, and the upper part will soon be ready, so as to enable the contractors to proceed with the rock work and embankment of the railroad along the narrows. Some delay was caused by the legal proceedings to which the company was obliged to resort, on account of the opposition made by a few landholders, who opposed the construction of the railroad, or were unwilling to make amicable settlements on terms to which the company was willing to accede. Most of these cases have been adjudicated on moderate terms, and the company now has legal possession, and is prepared to press forward its work.

We learn from the Chief Engineer, Solomon W. Roberts, Esq., who has recently returned from a tour of inspection upon the railroad, which was extended to its Western terminus, west of Mansfield, that the work is going on very favorably, and that the people generally along the line show the most lively interest in its speedy completion. Those residing upon the western division are anxious that it should be finished as soon as the eastern part of the road; and, in order to expedite the completion of the work to Massillon, or the Ohio Canal, the County Commissioners of Stark County, who had already subscribed \$75,000, made an additional subscription last week of \$30,000 to the stock of the company. The contractors will be required to complete the grading and masonry of the line from Pittsburgh to Massillon, by the first of April next.

In Wayne County, the five heavy sections east of Wooster, which were put under contract last autumn, are now about two-thirds done, and the work has proved less expensive than was expected, as there has been less rock found in the cuts.—The contractors are going on to complete those sections, and it is intended to press forward the work in Wayne County as fast as the payment of the instalments on the local stock will justify the board in doing it.

The location is now completed by Loudonville to Mansfield, and the general route of the road, to the point of intersection with the Cleveland and Columbus road, thirteen miles beyond Mansfield, is determined upon, and the detailed location will soon be made.

The directors of the Ohio and Pennsylvania railroad company trust that they will be sustained by the aid of all those interested in the enterprise, in their efforts to secure its speedy completion. It is emphatically, as it is called in Ohio, "THE PITTSBURGH RAILROAD;" it cannot be perverted to the

injury of this city, and our citizens are bound by their own interests to see that the operations of the company are not retarded by the want of means.—The directors are now endeavoring to obtain the most direct entrance possible into Allegheny City, and the establishment of a depot at a site which will be most convenient for the citizens of that city and also of Pittsburgh.—*Pittsburgh Gaz.*



NORTHERN RAILROAD, NEW YORK.

CARS run between Rouses Point and Chateaugay daily, Sundays excepted, as follows:

Leave Rouses Point at 3½ A.M.
Leave Chateaugay at 6½ P.M.

On the arrival of the cars at Chateaugay, stages are in readiness to take the passengers to Ogdensburg, where they arrive the same day.

Passengers leave Ogdensburg in the morning by stage, and take the evening train from Chateaugay to Rouses Point, where they go immediately on board the steamboats which run north and south on Lake Champlain.

Passengers leaving New York in the evening by the way of Whitehall, will arrive at Rouses Point the next night, and the next morning pass directly from the boat to the cars, and arrive at Ogdensburg the same day. CHARLES L. SCHLATER, Supt.

Patent Self-clinching Railroad Spikes.



These spikes have been in use upon various roads for several years, and have met with universal approval by Engineers. They drive in the manner shown, turning themselves, and are therefore not liable to work loose. They will prove of great value to secure the chair.

We are also manufacturing railroad spikes, hook and flat head; wrought chairs, clamps, etc., of superior quality, and are prepared to contract for any pattern or weight upon favorable terms.

SMITH & TYSON,

25 South Charles st., Baltimore Md.

Stickney & Beatty, DEALERS IN IRON AND IRON MANUFACTURERS.

AGENTS for the Balt. City Rolling Mill, from which establishment they are prepared to furnish Ellicott's round, square, and flat bar iron, puddled and charcoal boiler plates and billet iron—also agents for the sale of the Laurel and Maryland (Balt.) charcoal forge pig irons, Balt. hard iron for churning wheels, anti-Eaton nails, Catoctin foundry iron, boiler blooms from the Caledonian works, Wm. Jessop & Son's cast steel, Coleman's blister steel and nail rods, hoop, band, sheet, oval and common English iron.

Nos. 18 and 20 South Charles st., Baltimore.

NOTICE.

A young man of experience in Surveying wishes a situation on a Railroad as an Assistant. Please apply at this office.

NORRIS' LOCOMOTIVE WORKS, SCHENECTADY, N. Y.

THESE Works are in full operation in Manufacturing to order, Locomotive Steam Engines & Tenders, of the best principle and construction of material, using wrought iron heavy frames with pedestals welded thereto, and all parts of the engine made of the best wrought iron, except cylinders, pumps and boxes—obtaining greater durability, and carrying less weight over the road, than engines constructed of cast iron.

Wrought Iron Tires made any required size, and Tire Bars bent and welded with dispatch.

Chilled Wheels for Cars, Trucks and Tenders, made from the toughest iron.

Driving and Tender and Car Wheels fitted to Axles with Brass Boxes and Springs, and Railroad Machinery generally. Manufactured and for sale by

April 11, 1849.

E. S. NORRIS.

Theodolite for Sale.

A FIRST RATE 5 INCH THEODOLITE for sale at a bargain. Enquire at the Railroad Journal Office.

Election of an Engineer.

At a Meeting of the Board of Directors of the Virginia Central Railroad Co. at Charlottesville on the 4th day of June, 1850,

Resolved, That the election of a Chief Engineer in the place of Wm. A. Kuper, whose resignation has been accepted, is postponed to take place in Richmond on Tuesday the 18th of June instant.

A copy from the minutes.

JOHN GARRET, Secretary.

Lovegrove's Patent Cast Iron Water and Gas Pipes.

THE Subscriber, the Inventor and Patentee of the Centrifugal mode of giving form to metallic substances while in a molten state, is preparing to make Cast Iron Water and Gas Pipes, of any dimensions, at prices much lower than they can be made in the old manner, and the pipes warranted to stand a pressure of three hundred pounds to the square inch, and to be soft enough to drill. Steam Engines and all kinds of machinery. Cast Iron Doors and Frames, and Mill Castings of every description, made to order.

THOMAS LOVEGROVE,

Machinist and Founder,

West Falls Avenue, below Pratt st., Baltimore.

American Railway Guide, AND POCKET COMPANION FOR THE UNITED STATES;

CONTAINING Correct Tables, showing the time for starting of trains from all stations, distances, fares, etc., on all the Railway lines in the U. States; also many of the principal Steamboat and Stage routes—accompanied by a complete RAILWAY MAP. Price, single copies 12½ cts., or \$1 per annum. Published on the first of every month, corrected from returns furnished by the Railway Superintendents throughout the Union.

This book has been compiled somewhat on the plan of Bradshaw's Guide, with such improvements in size, form and arrangement as have seemed desirable; and the publisher confidently hopes it will not be found liable to the objections of incompleteness and incorrectness, which have been made, and justly too, against various other similar works heretofore issued.

The subscriber having had the management of the NEW YORK PATHFINDER almost from its commencement, has enjoyed superior facilities in obtaining information relating to the thoroughfares of travel, and is therefore well qualified to prosecute with success the arduous undertaking of furnishing a complete and correct national guide book.

STRINGER & TOWNSEND, General Agents, 222 Broadway: and sold also by Booksellers and Periodical Dealers generally throughout the country; also on all the Railways and Steamboats.

CURRAN DINSMORE, Publisher.

N. Y. Pathfinder Office,
138 Fulton St., New York City.

India-rubber for Railroad Cos.

RUBBER SPRINGS—Bearing and Buffer—Fulmer's Patent—Hose from 1 to 12 inches diameter. Suction Hose. Steam Packing—from 1-16 to 2 in. thick. Rubber and Gutta Percha Bands. These articles are all warranted to give satisfaction, made under Tyer & Helm's patent, issued January, 1849.—No lead used in the composition. Will stand much higher heat than that called "Goodyear's," and is in all respects better than any in use. Proprietors of railroads do not be overcharged by pretenders.

HORACE H. DAY,

Warehouse 23 Courtlandt street.

New York, May 21, 1849.

To Railroad Companies.

FOR SALE—A Second-hand Locomotive Engine and Tender, of about 10 tons weight, in good order, and warranted to perform well. Any company wanting a cheap engine for a passenger or light burden train, will rarely meet with an opportunity so favorable as the present. The engine and tender are in perfect running order, and will be tested to the satisfaction of any one wishing to purchase. Price \$1,500.

Address

J. B. MOORHEAD,

Frazer P.O., Chester county, Pa. P.S.—The Engine can be seen by calling on H. Osmond & Co., Car-builders, Broad st., Philadelphia.

September 6, 1849.

Spikes, Spikes, Spikes.

ANY person wishing a simple and effective Spike Machine, or a number of them, may be supplied by addressing

J. W. FLACK,

March 6, 1850.

Troy, N. Y.

Great American Engineering

AND MECHANICAL WORK, just published in medium folio, 75 cts. to Subscribers, One Dollar to non-subscribers.

Part V of "Specimens of the Stone, Iron and Timber Bridges, Viaducts, Tunnels, &c. &c. of the United States Railroads." By George Duggan, Architect and Civil Engineer.

The present part contains beautifully executed plans, elevations and sections of the Timber Viaduct across the Canewacta Creek at Lanesboro', Pa., and the Details of the Starucca, (stone) Viaduct near Lanesboro', Pa., on the line of the N. Y. & Erie R. R., with the specifications, estimates, etc.

N.B.—This work is published by subscription of the most eminent in the engineering profession of the U. States, and will be completed in 12 parts, at 75 cents each to those who remit their names and subscriptions before the 1st June next—when the first 6 parts or one half of the work will be published—after which the price will be raised to \$1 per part.

To those making a present remittance of \$5, and the remainder \$4, when they have been supplied with the first six parts, the work will be forwarded regularly as published. Parties remitting \$9 shall receive it monthly post-free in any part of the United States.

"It is a work that was a great desideratum, and must prove of great benefit to the engineering profession generally, and especially to the tyro in practical engineering and mechanical knowledge; in truth it strikes us, that it would require years of labor and patient toil on the part of a young engineer to prepare the drawings, and collect the information that will be embodied in this work, and can now be secured for the trifling sum of \$9"—[Scientific Amer. March 16, 1850.]

In connection with this subject (Iron Railroad Structures) we take occasion to call attention again to Mr. Duggan's valuable and expensive publication, exhibiting drawings, with full descriptions of the various stone, iron and wooden bridges, viaducts, tunnels, culverts, etc., of all the Railroads in the United States. Mr. Duggan is an accomplished Architect and Civil Engineer, who came from Ireland to it is country to exercise his profession; but finding Railroad construction here, in many respects, different from that he had been accustomed to in Europe, he applied himself to the study of our system; and the fruits of his researches and investigations embodied in this work, are well calculated to meet the exigencies of engineers, and to assist draughtsmen, bridge builders, mechanics and students.—[N. Y. Journal of Commerce, Feb. 14, 1850.]

Published by **GEORGE DUGGAN**,
300 Broadway, New York.

To whom all communications should be addressed, and subscriptions forwarded.

RAILROAD CAR AND COACH TRIMMINGS.

Doremus & Nixon,
IMPORTERS AND FURNISHERS

HAVE FOR SALE

Plain Garnet Plush. Fig. Garnet Plush (Butterfly pat.
"Crimson" "Crimson" "Elegant."
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BROCATELLES.

Crimson Silk Brocates. Gold and Maroon do.
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Silk and Wool " of every color.

MOQUETTES,

Of elegant designs and colors.

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The most beautiful goods ever shown in this country, and the subscribers are the sole agents for the sale of them.

Oil cloths Enamelled with Gold. } These goods can be
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Do. Silver ground velvet printed. } dimensions req'd.

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Of every description and quality.

JNO. W. A. STRICKLAND, Agent.
New York, 1850. 1y16

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CELEBRATED CAST STEEL**

AND

Best Cast Steel Royal Improved Files, well known as better adapted for Engineers' and Machinists' purposes than any now in use in the United States.

Every description of Square, Octagon, Flat and Round Cast Steel, Sheet, Shovel and Railway Spring Steel, etc., and Steel to order for any purposes—manufactured at their works in Sheffield—and universally known by the old stamp "Globe."

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Fire Brick.

THE Subscribers have constantly on hand Rafford's Stourbridge, Oak Farms Stourbridge, Lister, Wortley, Red and White Welsh Fire Bricks, common and fancy shapes. Also,

ROOFING SLATES,

from the best Welch quarries, and of all sizes. Also, COAL,

of all kinds—Liverpool Orrell and Cannel, Scotch, New Castle, Pictou, Sidney, Cumberland, Virginia, and all kinds of Anthracite coals. Also,

Pig Iron, Salt, etc., etc., for sale at the lowest market price. Apply to

SAMUEL THOMPSON & NEPHEW,
275 Pearl and 43 Gold Sts., New York.

November, 23, 1849.

FAIRBANKS' RAILROAD SCALES.—THE

subscribers are prepared to construct at short notice, Railroad and Depot Scales, of any desired length and capacity. Their long experience as manufacturers—their improvements in the construction of the various modifications, having reference to strength, durability, retention of adjustment, accuracy of weight and dispatch in weighing—and the long and severe tests to which their scales have been subjected—combine to ensure for these scales the universal confidence of the public.

No other scales are so extensively used upon railroads, either in the United States or Great Britain;—and the managers refer with confidence to the following in the United States.

Eastern Railroad.	Boston & Maine Railroad.
Providence Railroad.	Providence and Wor. Road.
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Schenectady Railroad.	Syracuse and Utica Road.
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Central (Ga.) Railroad.	Macon and Western Road.
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And other principal Railroads in the Western, Middle and Southern States.

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April 22, 1849. 1y*17

**STABILITY—SECURITY—PERPETUITY.
Mutual Life Insurance Co. of
New York.**

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A MILLION OF DOLLARS

Securely invested in Bonds and Mortgages on real estate in this city and Brooklyn, and stocks of the State and City of New York and United States Government.

The company declared a dividend of profits of fifty-two per cent. on all existing policies on the 31st of January, 1848. •

All the Profits are Divided Among the Insured.
Persons may effect insurance on their own lives and the lives of others.

A married woman can insure the life of her husband, the benefits of which are secured by law for the exclusive use of herself or children.

Clergymen and all others dependent upon salaries or their daily earnings are specially invited to avail themselves of a resource whereby their surviving families may be secured from the evils of penury.

Pamphlets explanatory of the principles of Mutual Life Insurance, and illustrating its advantages, with forms of application, may be obtained at the office of the company, 35 Wall street, or of any of its agents.

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Jos. B. Collins,	David C. Colden,
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John C. Cruger,	Eugene Duttlif,
Walter Joy,	Francis S. Lathrop,
Alfred Pell,	John C. Thatcher.

JOSEPH B. COLLINS, President.
ISAAC ABBATT, Secretary. 3m9

NOTICE TO**Superintendents of Railroads.**

TYLER'S PATENT SAFETY SWITCH.—The undersigned would respectfully call their attention to his Patent Safety Switch, which from long trial and late severe tests has proved itself perfectly reliable for the purpose for which it was intended. It is designed to prevent the train from running off when the switch is set to the wrong track by design or accident. The single rail or gate switch is established as the best and safest switch for the ordinary purpose of shifting cars from one track to another, but it is liable to the serious evil of having one track open or broken when connected with the other. My improvement entirely removes this evil, and while it accomplishes this important office, leaves the switch in its original simplicity and perfection of a plain unbroken rail, connecting one track with the other ready for use.

The following decision of the Commissioner of Patents is respectfully submitted to Railroad Engineers, Superintendents, and all others interested in the subject.

(COPY.)

UNITED STATES PATENT OFFICE,
Washington City, D.C., April 23th, 1846.

SIR: You are hereby informed that in the case of the interference between your claims and those of Gustavus A. Nicolls, for improvements in safety switches—upon which a hearing was appointed to take place on the 3d Monday in March, 1846, the question of priority of invention has been decided in your favor. Inclosed is a copy of the decision. The testimony in the case is now open to the inspection of those concerned.

Yours respectfully, **EDMUND BURKE,**
Commissioner of Patents.

To Philos B. Tyler.

Any further information may be obtained by addressing P. B. TYLER, Springfield, Mass., or JOHN DENTLETON, Agent, 149 Hudson St., New York.

Coal.

CUMBERLAND SEMI-BITUMINOUS COAL
superior quality for Locomotives, for sale by

H. B. TEBBETTS,
No. 40 Wall St., New York.

May 12, 1849. 1m19

PHILADELPHIA CAR MANUFACTORY,

CORNER SCHUYLKILL 2D AND HAMILTON STS.,
SPRING GARDEN, PHILADELPHIA CO., PA.

Kimball & Gorton,

Having recently constructed the above works, are prepared to construct at short notice all kinds of

RAILROAD CARS, Viz:

Passenger Cars of all classes—Open and Covered Freight and Express Cars—Coal Cars—Hand Cars & Trucks of all descriptions.

They are also prepared to furnish Chilled Wheels of any pattern. Car Wheels & Axles fitted and furnished. Snow Ploughs and Tenders made to order. Steel and other Springs always on hand.

All orders will be filled at short notice, and upon as good terms as at any other establishment in the country.

Omnibuses from the Exchange run within one square of the manufactory every 10 minutes during the day. Philadelphia, June 16, 1849. 1y25

C. W. Bentley & Co.,

IRON Founders, Portable Steam Engine Builders
and Boiler Makers, Corner Front and Plowman
Sts., near Baltimore St. Bridge,

BALTIMORE, MARYLAND.

Their Engines are simple in their construction, compact and durable; they require no brick work in setting them, and occupy but a small space (a six horse power engine and boiler, standing on a cast iron plate of three by six feet.)

They also manufacture Major W. P. Williamson's new oscillating Engine; a superior article, combining cheapness and simplicity (one of which may be seen in operation at their shop.) Both of these engines are adapted to any purpose, where power is required, and may be made of any capacity; and for economy in use of fuel are unsurpassed.

All kinds of machinery made to order. Steam Generators, Force Pumps, Wrought Iron Pipes and Fittings for Steam, Water, Gas, etc., constantly on hand, Baltimore, June 6, 1849.

CORROSIVE SUBLIMATE.

THIS article now extensively used for the preservation of timber, is manufactured and for sale by **POWERS & WEIGHTMAN**, manufacturing Chemists, Philadelphia.

Jan. 20, 1849.

ENGINEERS.**Atkinson, T. C.,**

Alexandria and Orange Railroad, Alexandria, Va.

Bancks, C. W.,

Civil Engineer, Vicksburg, Miss.

Berrien, John M.,

Michigan Central Railroad, Marshall, Mich.

Buckland, George,

Troy and Greenbush Railroad.

Clement, Wm. H.,

Little Miami Railroad, Cincinnati, Ohio.

Cozzens, W. H.,

Engineer and Surveyor, St. Louis, Mo.

Alfred W. Craven,

Chief Engineer Croton Aqueduct, New York.

Davidson, M. O.,

Eckhart Mines, Alleghany Co., Maryland.

Fisk, Charles B.,

Cumberland and Ohio Canal, Washington, D. C.

Felton, S. M.,

Fitchburg Railroad, Boston, Mass.

Floyd-Jones, Charles,

South Oyster Bay, L. I.

Gzowski, Mr.,

St. Lawrence & Atlantic Railroad, Montreal, Canada.

Gilbert, Wm. B.,

Rutland and Burlington Railroad, Rutland, Vt.

Grant, James H.,

Nashville and Chattanooga R. R., Nashville, Tenn.

S. W. Hill,

Mining Engineer and Surveyor, Eagle River, Lake Superior.

Holcomb, F. P.,

Southwestern Railroad, Macon, Ga.

Johnson, Edwin F.,

New York and Boston Railroad, Middletown Ct.

Latrobe, B. H.,

Baltimore and Ohio Railroad, Baltimore, Md.

Miller, J. F.,

Worcester and Nashua Railroad, Worcester, Mass.

Morris, Elwood,

Schuylkill Navigation, Schuylkill Haven, Pa.

Morton, A. C.,

Atlantic and St. Lawrence Railroad, Portland, Me.

McRae, John,

South Carolina Railroad, Charleston, S. C.

Nott, Samuel,

Lawrence and Manchester Railroad, Boston.

Prichard, M. B.,

East Tennessee and Georgia R. R., Cleveland, Tenn.

Roebbing, John A.,

Trenton, N. J.

W. Milnor Roberts,

Bellefontaine and Indiana Railroad, Marion, Ohio.

Roberts, Solomon W.,

Ohio and Pennsylvania Railroad, Pittsburgh, Pa.

Sanford, C. O.,

South Side Railroad, Virginia.

Schlatter, Charles L.,

Northern Railroad (Ogdensburg), Malone, N. Y.

Sours, Peter,

Rahway, New Jersey.

Stark, George.,

Bost., Con. and Mont. R. R., Meredith Bridge, N. H.

Steele, J. Dutton,

Pottstown, Pa.

Trimble, Isaac R.,

Philad., Wil. & Baltimore Railroad, Wilmington, Del.

Tinkham, A. W.,

United States Fort, Bucksport, Me.

Thomson, J. Edgar.,

Pennsylvania (Central) Railroad, Philadelphia.

Troost, Lewis,

Alabama and Tennessee Railroad, Selma, Ala.

Whipple, S.,

Civil Engineer and Bridge Builder, Utica, N. Y.

Williams, E. P.,

Auburn and Schenectady Railroad, Auburn, N. Y.

Williams, Charles H.,

Milwaukee, Wisconsin.

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\$1 Per Day.

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This Extensive Establishment, erected expressly for a Hotel, with every regard to comfort and convenience, is situated in the centre and most fashionable part of the city, and but a few minutes' walk from the Railroad Depots and Steamboat Landings.

The House has lately undergone a thorough repair, embracing many valuable improvements, and will accommodate 250 Guests. **BARNUM & CO.****JONES' HOTEL,****NO. 152 CHESTNUT STREET,**
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On the European Plan,

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Between Broadway and Nassau St.,
NEW YORK.**BUSINESS CARDS.****J. T. Hodge**Will attend to the examination of mining tracts near Lake Superior, and prepare Reports and Maps.
Address, during the Summer,
Ontanagon Postoffice, Lake Superior.**Cumberland Steam Coal,**

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FROSTBURG MINES, MD.**H. A. TUCKER,**Agent of Frostburg Coal Co.
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TROY, N. Y.**Nathan Caswell,****METAL BROKER, 69 WALL ST., N. Y.**

For the Purchase and Sale of Railroad Iron (new and old,) Boiler Plates, Pig and Bar Iron, Lead, Tin, Copper, Spelter, etc. Refers to

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" Grinnell, Minturn & Co., " "

" Barston, Pope & Co., " "

" Earps & Brink, Philadelphia.

" E. Pratt & Brother, Baltimore.

John Barstow, Esq., Providence.

Lewis Bullard, Esq., Boston.

February 9, 1850.

6m*

United States Railroad Guide and Steamboat Journal.**CONTAINING OFFICIAL TIME ADVERTISEMENTS,**
Tables of Stations, Distances, Fares, Time, etc., with much miscellaneous matter for the travelling public. Price 12 cents a copy. Yearly subscription \$1. Published at 43 Ann street, New York.**J. & Riley Carr,**

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STEEL,Of all Descriptions, Warranted Good.
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A full Stock of Steel and Files at all times on hand. 6m4

Walter R. Johnson,**CIVIL AND MINING ENGINEER AND AT-**
torney for Patents. Office and Laboratory, F St., opposite the Patent office, Washington, D. C.**Dudley B. Fuller & Co.,****IRON COMMISSION MERCHANTS,**No. 139 GREENWICH STREET,
NEW YORK.**Manning & Lee,****GENERAL COMMISSION MERCHANTS,**NO. 51 EXCHANGE PLACE,
BALTIMORE.Agents for Avalon Railroad Iron and Nail Works.
Maryland Mining Company's Cumberland Coal 'CED'
-Potomac' and other good brands of Pig Iron.**Cop Waste.****CLEAN COP WASTE,** suitable for cleaning Rail-
road, Steamboat and Stationary Engines, con-
stantly on hand and for sale by**KENNEDY & GELSTON,**

54 Pine St., New York.

October 27, 1849,

3m

Ranstead, Dearborn & Co.,

MANUFACTURERS OF

LOCOMOTIVE CRANKS AND CAR AXLES,

ALSO

WROUGHT IRON SHAFTING,

And All Kinds of Hammered Shapes.

Forge at Commercial Point, Dorchester,
Office 25 Foster's Wharf, opposite No. 211 Broad St.**BOSTON.****Henry J. Ibbotson,****IMPORTER of Sheffield and Birmingham Goods.**Also, Agent for the Manufacture of Telegraph
Wire. 218 PEARL ST., NEW YORK.**Cumberland, (Md.) Coals for Steaming, etc.****ORDERS RECEIVED FOR AND FILLED**
by **J. COWLES, 37 Wall St., N. Y.**

**Railroad Car Manufacturer's
Furnishing Store.****F. S. & S. A. MARTINE,**

IMPORTERS AND MANUFACTURERS OF

**RAILROAD CAR &
CARRIAGE LININGS,**

PLUSHES, CURTAIN MATERIALS, ETC.,

112 WILLIAM ST., NEAR JOHN.

3-4 and 6-4 Damasks, Union and Worsted; Mo-
reens, Rattinetta, Cloths, Silk and Cotton Velvets,
English Bunting**To Engineers and Surveyors.**E. BROWN AND SON Mathematical Inst. ma-
kers No. 27 Fulton Slip, New York, make and keep
for sale, Theodolites, Levelling inst., Levelling rods,
Surveyors Compasses, and Chains, Cases of Mathe-
matical drawing insts. various qualities, together with
a general assortment of Ivory Scales and small insts.
generally used by Engineers.**Samuel Kimber & Co.,
COMMISSION MERCHANTS**

WILLOW ST. WHARVES, PHILADELPHIA.

AGENTS for the sale of Charcoal and Anthracite
A Pig Iron, Hammered Railroad Car and Locomo-
tive Axles, Force Pumps of the most approved con-
struction for Railroad Water Stations and Hydraulic
Rams, etc., etc.

July, 27, 1849.

James Herron, Civil Engineer,OF THE UNITED STATES NAVY YARD,
PENSACOLA, FLORIDA.,

PATENTEE OF THE

HERRON RAILWAY TRACK.Models of this Track, on the most improved plans,
may be seen at the Engineer's office of the New York
and Erie Railroad.**To Railroad Companies.**—WROUGHT IRON WHEELS—
SAFETY AND ECONOMY.**NORRIS' LOCOMOTIVE WORKS,
SCHENECTADY, NEW YORK,**Are Manufacturing Wrought Iron Driving, Truck,
Tender, and Car Wheels—made from the best Ameri-
can Iron. Address E. S. NORRIS.
May 16, 1849.**Machinery Warehouse.**S. C. HILLS, No. 43 Fulton street, New York, has
constantly for sale Steam Engines, Boilers, Lathes,
Chucks, Drills, Planers, Force and Suction Pumps;
Tenoning, Morticing and Boring Machines, Shingle
Machines, Bolt and Nut Machines, Belting, Oil, Iron
and Lead Pipe; Rubber, Percha and Leather Hose,
&c., &c.S. C. H.'s arrangements with several machine shops
are such that he can supply, at very short notice, large
quantities of machinery.
November 23, 1849.**George O. Robertson,
BROKER IN SCOTCH AND
AMERICAN PIG IRON;**Bar Iron, Lead, Spelter, Tin, Copper, etc.,
No. 4 Liberty Place, MAIDEN LANE,
(Near Broadway.)
NEW YORK**Manufacture of Patent Wire
ROPE AND CABLES,**For Inclined Planes, Suspension Bridges, Standing
Rigging, Mines, Cranes, Derrick, Tilters, &c., by
JOHN A. ROEBLING, Civil Engineer,
TRENTON, N. J.**Samuel D. Willmott,
MERCHANT, AND MANUFACTURER OF
CAST STEEL WARRANTED SAWS,**

—AND FILES—

IMPORTER OF THE
GENUINE WICKESLY GRINDSTONES
NO. 8 LIBERTY STREET,
NEW YORK**Doremus & Harris,
ANALYTICAL & CONSULTING CHEMISTS,
179 BROADWAY, NEW YORK.**

SCHOOL OF CHEMISTRY.

IRON.**Railroad Iron.****3,000 TONS C. L. MAKE 63½ lbs. per yard,**
now landing and to arrive.Also contracts made for future delivery of above su-
perior make English Iron.

300 Tons Banks Best Iron, Round, Square and Flat.

200 " English Bar " " " "

10 " 9-16 Square Iron for Railroad Spikes.

For sale in lots to suit purchasers by

DAVID W. WETMORE.

New York, March 26, 1850. 3m

**SPRING STEEL FOR LOCOMOTIVES, TEN-
DERS AND CARS.**—The subscriber is engaged
in manufacturing spring steel from 1½ to 6 inches in
width, and of any thickness required: large quantities
are yearly furnished for railroad purposes, and where-
ever used its quality has been approved of. The estab-
lishment being large, can execute orders with great
promptitude, at reasonable prices, and the quality war-
ranted. Address J. F. WINSLOW, Agent,
Albany Iron and Nail Works.**Railroad Iron.**THE Undersigned, Agents for Manufacturers, are
prepared to contract to deliver Rails of superior
quality, and of any size or pattern, to any ports of dis-
charge in the United States.

COLLINS, VOSE & CO.,

74 South St.

New York, June 1, 1850.

Railroad Iron.

1,500 Tons weighing 58 lbs. per lineal yard.

500 " " 57 " " "

500 " " 56 " " "

500 " " 60 & 61 lbs. "

Also 2½x½ flat rails. All the above being of approv-
ed patterns. For sale by

DAVIS, BROOKS, & CO.,

68 Broad street.

N.B.—Rails imported on commission, or at a fixed
price.**Iron.**Pig Iron, Anthracite and Charcoal; Boiler and Flue
Iron, Spring and Blistered Steel, Nail Rods, Best Re-
fined Bar Iron, Railroad Iron, Car Axles, Nails, Stove
Castings, Cast Iron Pipes of all sizes, Railway Chairs
of approved patterns for sale by

COLEMAN, KELTON & CABELL,

109 N. Water St., Philadelphia.

IRONDALE PIG METAL, MANUFACTURED

and for sale by the Bloomsburg Railroad Iron Co.

LINDLEY FISHER, Treasurer.

75 N. Water St., Philadelphia.

Railroad Iron.**2000 Tons, weighing 58 pounds per lineal yard,**
of the most approved pattern of T rails, in
store and to arrive, for sale by

COLLINS, VOSE & CO.,

74 South St.

New York, June 1, 1850.

Railroad Iron.**1675 Tons, weighing about 61 lbs. per yard, 90**
tons, weighing about 52 lbs. per yard, and
825 tons, weighing about 53½ lbs. per yard, of the lat-
est and most approved patterns of T rail, for sale by

BOORMAN, JOHNSTON & CO.,

119 Greenwich street.

New York, Feb. 25, 1850.

N.B.—B., J. & Co are also prepared to take con-
tracts for English rails, delivered in any of the Atlan-
tic ports of the United States.**Railroad Iron.**THE UNDERSIGNED, HAVING made arrange-
ments abroad, are prepared to contract for the de-
livery of Foreign rails, of approved brands upon the
most favorable terms.They will also make contracts for American rails,
made at their Trenton works, from Andover Iron, in
whole or in part, as may be agreed upon.They are prepared to furnish Telegraph, Spring and
Market Wire; Braziers and Wire Rods; Rivets and
Merchant Bars to order, all made exclusively from An-
dover Iron. The attention of parties who require iron
of the very best quality for special purposes, is respect-
fully invited.

COOPER & HEWITT,

17 Burling Slip, New York.

February 15, 1850.

Glendon Refined Iron.Round Iron, Band Iron, Hoop Iron,
Square Flat, Scroll "Axles, Locomotive Tyres,
Manufactured at the Glendon Mills, East Boston, for
sale by

GEORGE GARDNER & CO.,

5 Liberty Square, Boston, Mass.

Sept. 15, 1849. 3m37

**PATENT HAMMERED RAILROAD, SHIP &
BOAT SPIKES.**—The Albany Iron Works
have always on hand, of their own manufacture, a
large assortment of Railroad, Ship and Boat Spikes
from 2 to 12 inches in length, and of any form of head.
From the excellence of the material always used in
their manufacture, and their very general use for rail-
roads and other purposes in this country, the manu-
facturers have no hesitation in warranting them fully
equal to the best spikes in market, both as to quality
and appearance. All orders addressed to the subscrib-
ers at the works will be promptly executed.

JOHN F. WINSLOW, Agent.

Albany Iron and Nail Works, Troy, N. Y.

The above Spikes may be had at the following prices, at
Erastus Corning & Co Albany; Merrill & Co., New
York; E. Pratt & Br 1st Es. 2nd Es. 3rd Es. 4th Es.**LAP-WELDED
WROUGHT IRON TUBES**

FOR

TUBULAR BOILERS,FROM ONE AND A QUARTER TO SEVEN
INCHES IN DIAMETER.THE ONLY Tubes of the same quality and man-
ufacture as those so extensively used in England,
Scotland, France and Germany, for Locomotive, Ma-
rine and other Steam Engine Boilers.

THOMAS PROSSER & SON, Patentees,

28 Platt street, New York.

Railroad Iron.THE UNDERSIGNED ARE PREPARED TO
contract for the delivery of English Railroad Iron
of favorite brands, during the Spring. They also re-
ceive orders for the importation of Pig, Bar, Sheet, etc.
Iron.

THOMAS B. SANDS & CO.,

22 South William street,

February 3, 1849. New York.

Iron Store.THE Subscribers, having the selling agency of the
following named Rolling Mills, viz: Norristown,
Rough and Ready, Kensington, Triadelphia, Pott-
grove and Thorndale, can supply Railroad Companies,
Merchants and others, at the wholesale mill prices for
bars of all sizes, sheets cut to order as large as 58 in.
diameter; Railroad Iron, domestic and foreign; Loco-
motive tire welded to given size; Chairs and Spikes;
Iron for shafting, locomotive and general machinery
purposes; Cast, Shear, Blister and Spring Steel; Bol-
ter rivets; Copper; Pig Iron, etc., etc.

MORRIS, JONES & CO.,

Iron Merchants,

Schuylkill 7th and Market Sts., Philadelphia.

August 16, 1849. 1y33

Railroad Iron.THE MOUNT SAVAGE IRON WORKS, AL-
legany county, Maryland, having recently pass-
ed into the hands of new proprietors, are now prepar-
ed, with increased facilities, to execute orders for any
of the various patterns of Railroad Iron. Commu-
nications addressed to either of the subscribers will have
prompt attention. J. F. WINSLOW, President

Troy, N. Y.

ERASTUS CORNING, Albany;

WARREN DELANO, Jr., N. Y.

JOHN M. FORBES, Boston.

ENOCH PRATT, Baltimore, Md.

November 6, 1848.

Railroad Iron.THE SUBSCRIBERS ARE PREPARED TO
take orders for Railroad Iron to be made at their
Phoenix Iron Works, situated on the Schuylkill Riv-
er, near this city, and at their Safe Harbor Iron Works,
situated in Lancaster County, on the Susquehanna
river; which two establishments are now turning out
upwards of 1800 tons of finished rails per month.Companies desirous of contracting will be promptly
supplied with rails of any required pattern, and of the
very best quality.

REEVES, BUCK & CO.

45 North Water St. Philadelphia.

March 15, 1849.

Monument Foundry.

A. & W. DENMEAD & SON,
Corner of North and Monument Sts.,—Baltimore,

HAVING THEIR

IRON FOUNDRY AND MACHINE SHOP

In complete operation, are prepared to execute faithfully and promptly, orders for Locomotive or Stationary Steam Engines, Woolen, Cotton, Flour, Rice, Sugar Grist, or Saw Mills, Slide, Hand or Chuck Lathes, Machinery for cutting all kinds of Gearing, Hydraulic, Tobacco and other Presses, Car and Locomotive patent Ring Wheels, warranted,

Bridge and Mill Castings of every description, Gas and Water Pipes of all sizes, warranted, Railroad Wheels with best faggotted axle, furnished and fitted up for use, complete. Being provided with Heavy Lathes for Boring and Turning Screws, Cylinders, etc., we can furnish them of any pitch, length or pattern.

Old Machinery Renewed or Repaired—and Estimates for Work in any part of the United States furnished at short notice.

June 8, 1849.

Iron Wire.

REFINED IRON WIRE OF ALL KINDS, Card, Reed, Cotton-flyer, Annealed, Broom, Buckle, and Spring Wire. Also all kinds of Round, Flat or Oval Wire, best adapted to various machine purposes, annealed and tempered, straightened and cut any length, manufactured and sold by

ICHABOD WASHBURN.

Worcester, Mass., May 25, 1849.

American and Foreign Iron.

FOR SALE,

300 Tons A 1, Iron Dale Foundry Iron.
100 " 1, " " " "
100 " 2, " " " "
100 " " Forge " "
400 " Wilkesbarre " "
100 " "Roaring Run" Foundry Iron.
300 " Fort " "
50 " Catactin " "
250 " Chikiswalongo " "
50 " "Columbia" "chilling" iron, a very superior article for car wheels.
75 " "Columbia" refined boiler blooms.
30 " 1 x 1/2 Slit iron.
50 " Best Penna. boiler iron.
50 " "Puddled" " "
50 " Bagnall & Sons refined bar iron.
50 " Common bar iron.

Locomotive and other boiler iron furnished to order.

GOODHUE & CO.,
64 South street

American Pig, Bloom and Boiler Iron.

HENRY THOMPSON & SON,
No 57 South Gay St., Baltimore, Md.,
Offer for sale. Hot Blast Charcoal Pig Iron made at the Catactin (Maryland), and Taylor (Virginia), Furnaces; Cold Blast Charcoal Pig Iron from the Cloverdale and Catactin, Va., Furnaces, suitable for Wheels or Machinery requiring extra strength; also Boiler and Flue Iron from the mills of Edge & Hilles in Delaware, and best quality Boiler Blooms made from Cold Blast Pig Iron at the Shenandoah Works, Va. The productions of the above establishments can always be had at the lowest market prices for approved paper. American Pig Iron of other brands, and Rolled and Hammered Bar Iron furnished at lowest prices. Agents for Watson's Perth Amboy Fire Bricks, and Rich & Cos. New York Salamander Iron Chests.
Baltimore, June 14, 1849. 6 mos

Wheel, Forge and Foundry Iron.

LOCUST GROVE Wheel Iron of great strength and superior chilling property.
Balt. Charcoal Forge Iron, from Patuxent, Curtis Creek and Gunpowder furnaces.
Elkridge Foundry Iron, of superior strength and softness. Anthracite and Charcoal Iron from Pennsylvania and Virginia. Gas and Water Pipes, Lamp Posts from Elkridge furnace.

LEMMON & GLENN,
62 Buchanan's Wharf, Baltimore.

Iron.

THE SUBSCRIBERS having resumed the agency of the New-Jersey Iron Company, are prepared to execute orders for the different kinds and sizes of Iron usually made at the works of the company, and offer for sale on advantageous terms.—

150 tons No. 1 Boonton Foundry Pig Iron.
100 " No. 2 do. do. do.
300 " Nos. 2 & 3 Forge do. do.
100 " No. 2 Glendon do. do.
140 " Nos. 2 & 3 Lehigh Crane do. do.
100 " No. 1 Pompton Charcoal do.
100 " New-Jersey Blooms
50 " New-Jersey Faggoting Iron, for shafts
Best Bars, 1/2 to 4 inch by 1/2 to 1 inch thick.
Do do Rounds and Squares, 1/2 to 3 inch.
Rounds and Squares, 3-16 to 1 inch.
Half Rounds, 1/2 to 1 in. Ovals & Half Ovals 1/2 to 1 1/2 in.
Bands, 1 1/2 to 4 inch. Hoops, 1/2 to 2 inch.
Trunk Hoops, 1/2 to 1 1/2 in. Horse Shoe & Nut Iron.
Nail Plates. Railroad Spikes.
DUDLEY B. FULLER & Co., 139 Greenwich-st. and 85 Broad-st.

WILLIAM JESSOP & SONS' CELEBRATED CAST-STEEL.

The subscribers have on hand, and are constantly receiving from their manufactory

PARK WORKS, SHEFFIELD,
Double Refined Cast Steel—square, flat and octagon.
Best warranted Cast Steel—square, flat and octagon.
Best double and single Shear Steel—warranted.
Machinery Steel—round.
Best and 2d gy. Sheet Steel—for saws and other purposes.

German Steel—flat and square, "W. I. & S." "Eagle" and "Goat" stamps.
Genuine "Sykes" L. Blister Steel.
Best English Blister Steel, etc., etc., etc.

All of which are offered for sale on the most favorable terms by **WM. JESSOP & SONS,**
91 John street, New York.

Also by their Agents—

Curtis & Hand, 47 Commerce street, Philadelphia.
Alex'r Fullerton & Co., 119 Milk street, Boston.
Stickney & Beatty, South Charles street, Baltimore.
May 6, 1848.

JOHNSON, CAMMELL & Co's Celebrated Cast Steel,

ENGINEERING AND MACHINE FILES, which for quality and adaptation to mechanical uses, have been proved superior to any in the United States. Every description of square, octagon, flat and round cast steel, sheet, shovel and railway spring steel, best double and single shear steel, German steel, flat and square, goat stamps, etc. Saw and file steel, and steel to order for any purposes, manufactured at their Cyclops Steel Works Sheffield.

JOHNSON, CAMMELL & CO.,
100 William St., New York.

November 23 1849.

Railroad Iron.

OF ANY PATTERN AND WEIGHT,
Of a Favorite Brand,

And deliverable in Bond, or Duty paid, at any Port of the U. S., contracted for on favorable terms, by

CHARLES ILLIUS,
20 Beaver St., New York.

Pig and other Iron also contracted for. Sole Agent for "Baxter's Machine and Burning Oil"—particularly adapted for "Railroads" and other Machinery—Preferred to Sperrn by the many now using it, and 25 per cent. cheaper.

CUT NAILS OF BEST QUALITY, BAR IRON (including Flat Rails) manufactured and for sale by **FISHER, MORGAN & CO.,**
75 N. Water St., Philadelphia.

Ogden & Martin's ROSENDALE CEMENT.

WE are prepared to enter into arrangements for supplying our Cement for public works or other purposes. We warrant the cement equal in every respect to any manufactured in this country. It attains a great degree of hardness, sets immediately under water, and is a superior article for masonry coming in contact with water, or requiring great strength.

For sale in tight barrels, well papered, at their office by **OGDEN & MARTIN,** 104 Wall st.

February 16, 1850.

The above cement is used in most of the fortifications building by government.

To Steam Engine Builders.

THE Undersigned offer for sale, at less than half its cost, the following new machinery, calculated for an engine of 62 inches cylinder and 10 feet stroke, viz.

- 2 Wrought Iron Cranks, 60 inches from centre to centre.
- 1 Do. do. Connecting Rod Strap.
- 2 Do. do. Crank Pins.
- 1 Eccentric Strap.
- 1 Diagonal Link with Brasses.
- 1 Cast Iron Lever Beam (forked).

The above machinery was made at the West Point Foundry for the U. S. Steamer Missouri, without regard to expense, is all finished complete for putting together, and has never been used. Drawings of the cranks can be seen on application to

HENRY THOMPSON & SON,
No. 57 South Gay St., Baltimore, Md.

Sept. 12, 1849.

8,000 Tons Railroad Iron.

THE OHIO AND PENNSYLVANIA RAILROAD CO. wish to contract for eight thousand tons of Railroad Iron, for the eastern division of their road, extending westward from Pittsburgh. Three thousand tons to be delivered on the Ohio river at Pittsburgh and Beaver, before the close of canal navigation in the present year, 1850; and the remainder in the spring of next year. The rails are to be of the H pattern, in lengths of 20 feet, and are to weigh 60 lbs. per lineal yard. They are to be subject to the inspection of Solomon W. Roberts, Chief Engineer.—For further particulars address the President of the Company at Pittsburgh.

By order of the Board of Directors.

WM. ROBINSON, Jr., President.

S. S. Keyser & Co., IRON WAREHOUSE,

Corner of South and Pratt Streets,
BALTIMORE, MD.

Selling Agents for the Rough and Ready Bar Iron and Elk Boiler and Flue Iron Rolling Mills, Sarah and Taylor Furnaces, and Wrightsville Hollow Ware Foundry, and Dealers in Bar and Sheet Iron, and Cast, Sheer, German, Blister, Spring and Electroplated Steel, etc., etc.

Smith & Tyson,

GENERAL COMMISSION MERCHANTS,
No. 25 South Charles St., Baltimore, Md.

AGENTS for the Celebrated Columbia Pig Iron, suitable for Car Wheels and Chilled Rolls.
Columbia refined Charcoal Blooms; Refined Charcoal Juniata Billet Iron for Wire; Refined Iron for Bridging, of great strength; Cut Nails, Spikes, and Brads; Railroad Spikes and Wrought Chairs. 22tf

To Railroad Companies and Contractors.

FOR SALE.—Two Locomotive Engines and Tenders, at present in use on the Beaver Meadow Railroad, being too light for their coal trains, but well calculated for either gravel or light passenger trains.

They weigh, in running order, about 8 tons each—having one pair of driving wheels 4 feet diameter, 4 truck wheels 30 inches diameter, with cylinders 10 in. diameter, and 18 inches stroke of piston. Tenders on 4 wheels. Address **JAMES ROWLAND,**

Prent. Beaver Meadow Railroad & Coal Co.,
Philadelphia.

or, **L. CHAMBERLAIN, Secy,**
at Beaver Meadow, Pa.

May 19, 1849. 20tf

Railroad Instruments.

THEODOLITES, TRANSIT COMPASSES, and Levels, with Fraunhoffer's Munich Glasses, Surveyor's Compasses, Chains, Drawing Instruments, Barometers, etc., all of the best quality and workmanship, for sale at unusually low prices, by

E. & G. W. BLUNT,

No. 179 Water St., cor. Burling Slip.
New York, May 19, 1849.

Rosendale Cement.

THE NEWARK AND ROSENDALE LIME AND CEMENT CO. are now manufacturing at their works in NEWARK, N. J., and Ulster county, N. Y., a very superior article of Hydraulic Cement—also Lime Calcine Plaster, etc. Contractors and dealers will find it to their advantage to call or make application before purchasing elsewhere. All communications addressed to the subscriber, at Newark, N. J., will be punctually attended to.

1y*15 **HENRY WILDE, Secretary.**

Patent India Rubber Steam Packing.

THIS article, made by the subscriber, who alone is authorised to make it, is warranted to stand as high a degree of heat as any that has been or can be made by any person—and is the article which has made the reputation of India Rubber Steam Packing and the demand therefor. A large assortment of all thick nesses requisite for any description of engines, steam pipes, valves, etc., constantly on hand and for sale by the manufacturer and patentee, who will give every information regarding its properties, mode of use, etc. at the warehouse.

JOHN GREACHEN, JR.,

98 Broadway, opposite Trinity Church.
New York, October, 1849.

Passenger Car Linings.

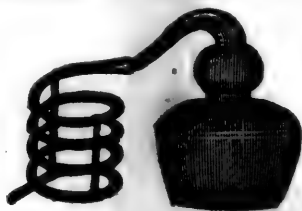
THE Advertiser continues to make to order the Enamelled Car Linings which have been so highly approved the last three years, and are now exclusively used by all the Northern Railroads. No pains are spared to get out new styles, and adapt them to the tastes of every consumer.

Orders addressed to CHARLES STODDER, No. 75 Kilby street, Boston, will have prompt attention.
March 23, 1850. 2m

CAUTION.

RAILROAD COMPANIES and others are hereby cautioned against using or vending our improvement for easing the lateral motion as applied on Railroad Cars. Letters Patent having been granted to us in 1841, any party or parties so making or using said improvement without license from us will be proceeded against according to law.

DAVENPORT & BRIDGES.



P. H. Griffin,

Corner of Steuben and James Sts. Albany, N.Y.
CONTINUES to manufacture copper flues for locomotive boilers, brewers' coppers, stills, tanner heaters, etc. Copper work in general, at the shortest notice. He has constantly on hand brass cocks, brass valves, copper pumps of every variety.
Orders promptly attended to. 1y14

FOWLER M. RAY'S Patent India-rubber Railroad CAR SPRING.

New York and Erie Railroad Shops.
Piermont, March 26, 1850.

This will certify that from practical experience in the use of Fowler M. Ray's India rubber Car Springs, I believe them to be far superior to any others now in use.

I have never known them to be affected by any change of temperature, as other Rubber Springs have been affected on this road.

I am at the present time repairing a Passenger Car that Mr. Ray and myself mounted with his springs about two years and eight months since.

The springs are at the present time as perfect, to all appearances, as when first applied to the car.

Respectfully yours,

HORACE B. GARDNER,
Foreman of the Car Shops.

Supt. Office N.Y. & H. R.R., }
New York, March 8, 1850.

This is to certify that we have used the Rubber Springs manufactured by Mr. F. M. Ray for the past twenty months, "both for Passenger and Freight Car Springs and Bumpers, and of different sizes," and have in every case given entire satisfaction, and I consider them the best spring now in use.

M. SLOAT, Supt.

Harlem R.R. Depot, }
New York, March 7, 1850.

This is to certify that we have used Mr. F. M. Ray's India-rubber Springs for over eighteen months, and find them to be easy and durable, and recommend them to railroad companies as being superior to anything we have tried.

J. M. SMART,
Foreman at 42d St. Depot.

Office New Jersey Railroad Co., }
Jersey City, March 8, 1850. }

FOWLER M. RAY, Esq.,

Dear Sir: In answer to your enquiries respecting the operation of the Vulcanised Rubber Springs, purchased by our company from you some two years since, I reply that they are superior to any spring in use, (that I have either seen or heard of).

The improved form of your spring, consisting of a solid piece of vulcanised rubber with bands on the outside, is far superior to your first form, consisting of disks of rubber with metallic plates interposed.

The last named form was tried, if you recollect, at a much earlier period; and then was replaced by your last form.

I have no hesitation in saying that your springs have given entire satisfaction, and most cheerfully recommend them to railroad companies throughout the country for the following reasons:

1st. The cost is 30 per cent. less.

2d. Saving of weight on each car of 8 wheels from 700 to 900 lbs.

3d. Less care and attention is required, as they are not liable to get out of repair.

4th. A great saving is secured in the wear and tear of the cars and rails from their great elasticity.

5th. The freedom from noise.

6th. There is greater safety in case of accident, as they cannot be broken.

7th. The comfort of passengers is enhanced sufficiently to pay the expense, waiving all the other reasons that I have given.

Should this fail to satisfy any person enquiring, you are at liberty to refer to me, No. 150 Washington St., Jersey City.

Yours respectfully,

T. L. SMITH, Supt.

New York, March 11, 1850.

I have used the Patent India-rubber Spring purchased of Mr. Ray, upon the cars of the New York and New Haven Railroad, and have found them efficient and economical; and when applied to the axles and draw springs, believe them to be quite equal to any in use. I have found a combination of these springs with a steel spring under the transom beam a very satisfactory arrangement, and am now using this plan in all new cars.

Yours respectfully,

ROBERT SCHUYLER.

February 25, 1850.

From practical observation of the use of the India-rubber Car Springs, manufactured and sold by your company, we are entirely satisfied in their application, and do not hesitate to recommend them as elastic, durable, requiring no repairs for years, and retaining their consistency during all extremes of weather. We have applied them for the past two years, and consider them superior for all railroad purposes.

Yours truly,

OSGOOD BRADLEY, Car Builder, Worcester.

T. & C. WASON, do. Springfield.

DEAN, PACKARD & MILLS, do. do.

DAVENPORT & BRIDGES, do. Cambridgeport.

Office of the New Jersey Railroad Co., }
Jersey City, March 7, 1850. }

This is to certify that we have had Mr. F. M. Ray's India-rubber Springs in constant use under our cars, and as Bumper Springs for upwards of two years, and they have in every way given perfect satisfaction.

The present form of spring we deem far superior to the form of Disk, having used both forms, although we have none of those made in Disks at present in use.

We take pleasure in recommending these springs to all railroad companies.

J. P. JACKSON, Vice Pres.
New Jersey Railroad and Trans. Co.

Roxbury, February 23, 1850.

In compliance with your request, I take great pleasure in stating the result of my experience in the use of "Ray's Patented Vulcanised India-rubber Car and Engine Springs." We have used them nearly two years, and never had one fail in any way. The cold weather does not affect them, as it has other rubber springs we have used.

With sixteen years' experience as superintendent of machinery on the Boston and Providence railroad, I take pleasure in saying that your springs are the best we ever used, or I ever saw used elsewhere. We have 20 cars rigged with them, of which I can say that the springs are as good now as when first applied. I put 24 lbs. of the rubber under the forward end of one of our heaviest engines, taking off 250 lbs. of steel springs—it has been in use 18 months, and is in as good condition now as when first put under the engine.

Very respectfully yours,

GEO. S. GRIGGS,

Supt. of Machinery, Boston and Prov. R.R.

Fall River, February 2, 1850.

In answer to yours of the 20th ult. I would say that this company has for some 10 or 12 months past been using "Ray's India-rubber Springs." We have applied them to both passenger and freight cars with uniform success. They have invariably preserved their elasticity and consistency through all the extremes of weather; and we are now applying them whenever the steel spring fails. I am well satisfied that they are particularly adapted for railroad purposes.

Very respectfully yours,

GEO. HAVEN,

Supt. Fall River Railroad.

Jersey City, March 9, 1850.

This is to certify that the present form of Mr. F. M. Ray's India-rubber Car Spring I consider far superior to the form of Disk, having used both forms.

I take pleasure in recommending these springs to all railroad companies.

DAVID H. BAKER,

Foreman of Car Shop of N.J. R.R. & Trans. Co.

Boston, March 5, 1850.

In answer to your enquiry about India-rubber Springs, I have to say that we have used them to a considerable extent on both freight and passenger cars, and also on several of our tenders; and I am very well satisfied that they answer all the purposes for which they are intended. I believe the India-rubber will soon supersede all other springs for cars and tenders.

Yours truly,

S. M. FELTON,

Supt. Fitchburg Railroad.

Old Colony Railroad Office,

Boston, March 6, 1850.

EDWARD CRANE, Esq.,

President New England Car Co.,

Dear Sir: In compliance with your request I would state that the Old Colony Railroad Company have had in use upon their road, India-rubber Springs furnished by your company, for more than eighteen months past, during which time they have been extensively used under Passenger and Freight Cars, Locomotive Tenders, and for Drawer and Bumping Springs, with the most perfect success. The elasticity and consistency of the Rubber has never been unfavorably affected by either extremes of heat or cold—and from the experience which we have had in the use of Rubber Springs, I think them well adapted for railroad purposes—and therefore we have for some months past used Rubber almost exclusively, in all places where springs are required.

Respectfully yours, etc.,

JAS. H. MOORE,

Supt. O. C. Road.

Troy, February 27, 1850.

We have been using your India-rubber Car Springs for nearly two years—and we take pleasure in saying that in our opinion the rubber has to a certain extent already, and may eventually entirely supersede all other Springs for Railroad Car purposes. We now use it entirely for Draw Springs and Bumpers, considering it better and lighter than steel.

During our two years' experience in the use of it, we have not known any to lose their elasticity, or fail in any way; and we cheerfully recommend the rubber for railroad car springs.

Very respectfully,
EATON, GILBERT & CO.

To Practical Machinists.

AN excellent opportunity now occurs to a practical Machinist, of well established reputation, and some capital, to engage extensively in the STEAM ENGINE, BOILER and FOUNDRY BUSINESS.

An establishment is now ready for business, ample in all its details, including extensive wharf room, for any sized steamboats, and from its position, if properly conducted, will doubtless command a large share of business.

A practical Machinist, as a partner is required, to conduct the whole establishment: and only those FULLY COMPETENT need apply. Address (post paid) "MACHINE CO.," Box No. 741, Philadelphia, Pa. 1m14

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THIS superior article for igniting the charge in wet or dry blasting, made with DUPONT'S best powder, is kept for sale at the office and depot of

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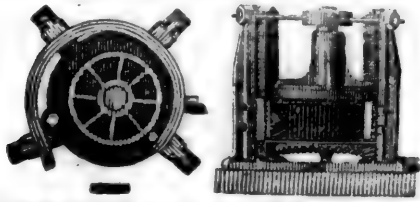
And in the principal cities and towns in the U. States. The Premium of the AMERICAN INSTITUTE was awarded to the Etna Safety Fuse at the late Fair held in this city.

November 3, 1849.

ly

MACHINERY.

Henry Burden's Patent Revolving Shingling Machine.



THE Subscriber having recently purchased the right of this machine for the United States, now offers to make transfers of the right to run said machine, or sell to those who may be desirous to purchase the right for one or more of the States.

This machine is now in successful operation in ten or twelve iron works in and about the vicinity of Pittsburgh, also at Phoenixville and Reading, Pa., Covington Iron Works, Md., Troy Rolling Mills, and Troy Iron and Nail Factory, Troy, N. Y., where it has given universal satisfaction.

Its advantages over the ordinary Forge Hammer are numerous: considerable saving in first cost; saving in power; the entire saving of shingler's, or hammerman's wages, as no attendance whatever is necessary, it being entirely self-acting; saving in time from the quantity of work done, as one machine is capable of working the iron from sixty puddling furnaces; saving of waste, as nothing but the scoria is thrown off, and that most effectually; saving of staffs, as none are used or required. The time required to furnish a bloom being only about six seconds, the scoria has no time to set, consequently is got rid of much easier than when allowed to congeal as under the hammer. The iron being discharged from the machine so hot, rolls better and is much easier on the rollers and machinery. The bars roll sounder, and are much better finished. The subscriber feels confident that persons who will examine for themselves the machinery in operation, will find it possesses more advantages than have been enumerated. For further particulars address the subscriber at Troy, N. Y. P. A. BURDEN.

Railroad Spikes and Wrought Iron Fastenings.

THE TROY IRON AND NAIL FACTORY, exclusive owner of all Henry Burden's Patented Machinery for making Spikes, have facilities for manufacturing large quantities upon short notice, and of a quality unsurpassed.

Wrought Iron Chairs, Clamps, Keys and Bolts for Railroad fastenings, also made to order. A full assortment of Ship and Boat Spikes always on hand.

All orders addressed to the Agent at the Factory will receive immediate attention.

P. A. BURDEN, Agent,
Troy Iron and Nail Factory, Troy, N. Y.

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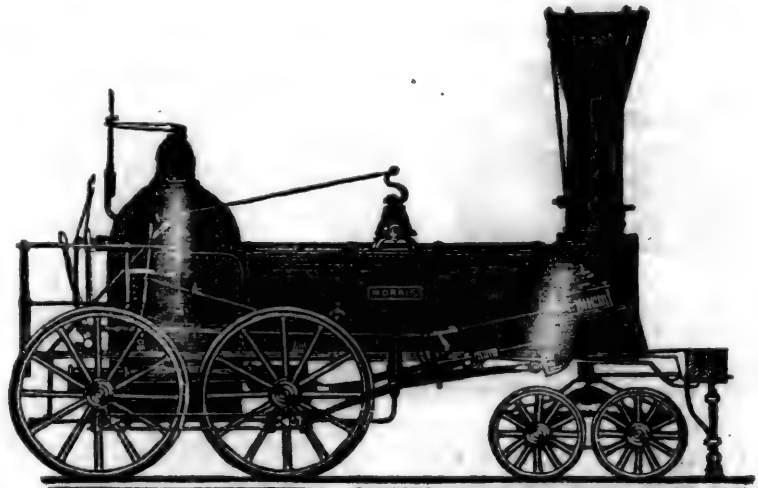
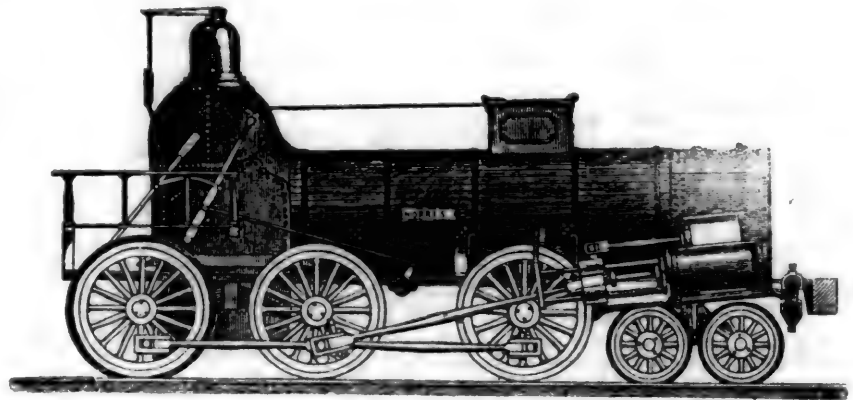
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He also offers to furnish Rolling Mill Castings, and other Mill Gearing, with promptness, having, he believes, the largest stock of such patterns to be found in the country.

Kensington, Philadelphia Co.,
March 12, 1848.

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Iron and Brass castings, Axles, etc., fitted up complete with Trucks or otherwise.

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LAWRENCE'S ROSENDALE HYDRAULIC Cement. This Cement is warranted equal to any manufactured in this country, and has been pronounced superior to Francis' "Roman." Its value for Aqueducts, Locks, Bridges, Floors, and all Masonry exposed to dampness, is well known, as it sets immediately under water, and increases in solidity for years. For sale in lots to suit purchasers, in tight papered barrels, by

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The Troy Iron and Nail Factory have all ways on hand a general assortment of Horse Shoes, made from Refined American Iron.

Four sizes being made, it will be well for those ordering to remember that the size of the shoe increases as the numbers—No. 1 being the smallest.

P. A. BURDEN, Agent,
Troy Iron and Nail Factory, Troy, N. Y.

COLUMBUS, OHIO,

Railroad Car Manufactory.
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HAVE established at this central point, the manufacture of Passenger, Freight, Gravel and Hand Cars for Railroads, and assure all Western Railroad Companies that it will be their constant aim to procure the best materials and workmen, and to turn out the best kind of work at fair prices. Specimens may be seen on the Columbus and Xenia Railroad. The patronage of Railroad Companies is respectfully solicited. 1y8

To Inventors and Patentees.

OWEN G WARREN, ARCHITECT, Has had many years' experience as Agent for obtaining Patents, both in this country and Europe, and will transact such business promptly and reasonably. Persons at a distance can have their business done by correspondence—without the necessity of visiting this city or Washington. Office No. 94 Merchants Exchange, Wall st., corner of Hanover st., up stairs. 1y3

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STEAM NAVIGATION, COMMERCE, MINING, MANUFACTURES.

HENRY V. POOR, Editor.

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American Railroad Journal.

PUBLISHED BY J. H. SCHULTZ & Co., 136 NASSAU ST.

Saturday, June 29, 1850.

An Essay on Pen and Pocket Cutlery,

Embracing a Detailed Description of the Mechanical, Chemical, and Manual Operations Performed on Certain Raw Materials, to Convert them into the Means, Implements, and Materials, for Manufacturing Pen and Pocket Knives.

BY A. L. HOLLEY.

Continued from page 356.

CHAPTER VI.—CUTLERS. WARE-ROOMS. MATERIAL MAKERS. BRASS—TABLE OF PROPORTIONS. COPPER. ZINC. GERMAN SILVER. BOLSTERS. SCALES. CUTLER'S TOOLS AND IMPLEMENTS. MATERIALS FOR A FOUR BLADE, SHELL HANDLED CONGRESS KNIFE.

Having described the ancient methods of making spring and other knives, and given their history from 1297 to the present time, a period of 553 years, we will look at the business of the cutler, or as now termed handlemaker, which was the original trade, and from which proceeded the three separate trades of forging, grinding and material making, the first

two of which have been described (see chapters III and IV,) and the latter will be looked into in connection with handlemaking.

Knife factors are furnished with a material or ware room, and a finishing and packing room, in addition to the apartments occupied by forgers, grinders, cutlers, etc. We first come to the present English method of making a fine, four blade, tortoise shell handled, Congress knife. The blades are taken from the ware room, in the same state as left by the grinder, usually still covered with lime. They are of course partially bright on the face, but dark on the tang's side, and rough on the edges.—The springs are taken as left by the spring forger, rough and imperfectly fitted. The scales, bolsters, shield and shell, are as left by the material maker, and the wire in pieces of several yards length.—The material maker forms the middle and side scales of brass, which is an alloy of copper and zinc. A species of light colored gun metal, called brass, is an alloy of copper and tin, and is often used for mechanical purposes, tools and implements, because harder than copper and zinc, and from the analysis of ancient brass, we find it also to be copper and tin, hard in proportion to the quantity of the latter contained. The elasticity of this metal renders it well adapted to the making of bells.

Pinchback is copper with a very small proportion of zinc, and is frequently "got off" for gold, on to the inexperienced and the verdant. The alloy of copper, tin and zinc is a chemical compound, therefore we have laws and rules for uniting it in the best proportions. The weight of one atom of copper is 8, of tin 7.25, and of zinc 4. The following table exhibits the proportions of the alloys, the color, etc.

Atoms.	Proportion by weight.	Color and use.
Copper+zinc....	1 to 2..	Best for common purposes, and is common brass.
3 Copper+zinc....	4 to 1..	Very malleable, and is used for watch work. Yellow.
Copper+2 zinc..	1 to 1..	Prince metal. Gold color.
Copper+6 zinc..	1 to 3..	Very brittle and hard. [Nearly white.
Tin+3 copper...11	to 36.	Bell metal.
Tin+9 copper...11	to 108.	Bronze; used for some kinds of machinery.
4 Tin+copper....11	to 3..	Coarse, white, and too hard for any purpose.

One method of making brass, is by cementing sheets of copper and zinc by charcoal. The present English method is by melting together copper in round masses, or in bars, with calamine, which is a native oxide or ore of zinc, a native carburet of zinc after combining with oxide of iron, which make it of a redish color, and it usually contains more or less lead. The calamine is powdered and separated by washing, then heated on the hearth of a reverberatory furnace, which expels the volatile matter, usually water and carbonic acid. The remainder is oxide of zinc, and a small portion of carbon, which the heat cannot wholly remove, and some earthy substances. The proportions are nearly equal weights of copper, and calamine, and one tenth of their weight of pulverised charcoal, which are together put into a crucible capable of containing 100 lbs. of brass when completed, but when charged, holding copper 663, calamine 63, and charcoal 13, which is covered with clay, sand, etc., to keep it free from the air. The fire is continued from 12 to 20 hours, when the refuse is poured off, the refuse metal cast into ingots, then usually remelted and cast, to render it better and finer, when it is rolled, drawn, or made into castings for use.

Brass is often made by melting together small pieces of cast copper and zinc, which is made into ingots, then rolled into sheets, slitted, and drawn into wire. For knife scales, sheet brass is used which is not annealed, but stiff and hard. Corinthian brass, famous in antiquity, was an alloy of gold, silver and copper. Lucius Nummius, 146 years before Christ, captured and burned the city of Corinth, and the violence of the conflagration formed, from the abundance of metals in its course, a solid sea of this alloy in the streets and low places. German chemists make copper of a gold color, by exposing it to the fumes of zinc. The comparative stiffness of this alloy permits it to be cut by saws and files, turned and worked much easier than iron. The metal anciently called brass is the copper of modern times, and the Colossus at Rhodes, and other so called brazen fabrics, were formed entirely of the last named metal. Copper (from Cuprum, a corruption of Cyprum, the island of Cyprus, whence it was formerly brought) was known at a very remote period, and before iron was used this was the chief material for domestic implements and utensils, and weapons of war. The ancients, though they used great quantities of this metal, consumed little compared with the modern nations.

The combining volume of copper is 64, its specific gravity 8.584 after fusion, and 8.953 after it is rolled. Its temperature at the point of fusion, is 2548 Fahr. In its pure state it is a very brilliant metal, of fine red color, and essentially different from every other metal, except titanium. One cubic foot of melted copper weighs 545 lbs., one of native metal 600 lbs., and one of copper medals 620 lbs. A wire of copper, .078 of an inch in diameter, will sustain 302 lbs. avoirdupois. A bar of cast copper, one fourth of an inch thick, requires 1192 lbs. to break it, but a bar of hammered copper, of the same dimensions, will sustain 2112 lbs. It is very ductile, and highly malleable, and called by turners and copper workers "stringy," and "sticky." It is not an uncommon mineral, and is obtained in Sweden, in arborescent groups, and is found beautifully crystallized. There is in the cabinet of Adjuda, near Lisbon, a piece of the latter, weighing 2617 lbs. In Cornwall, England, and in one of the Faroe islands, beautiful specimens are obtained, with zeolite, imbedded in amigdaloidal trap. The various sulphurets of copper, are the most abundant of its ores, and of these the most so, is copper pyrites, containing copper, sulphur and iron, and of a fine yellow color. The malachite, red ore and others, are usually associated with these in very small quantities. To obtain the pure metal, these ores are roasted in a furnace with connected flues, in which the volatilized sulphur is collected, then fused, which occasions a combination of the oxide of iron in the copper ore with a quantity of silica, which is usually present, but if not, is supplied, while the iron not melting so easily as copper, is left in the scoria.—The product of this operation is called "coarse metal." This is again roasted at a low heat, which dissipates the remaining sulphur, and oxidizes the remaining iron. After the second fusion a compound remains, containing 60 per cent. copper, and is called "coarse copper," which is exposed to the action of air which passes through the furnace, and the heat is gradually raised to the melting point, and continued from 12 to 24 hours, when it is cast into pigs, and termed "blistered copper." This, covered with charcoal, is often again roasted, to free it from the remaining impurities, and melted and cast till it becomes fine and ductile, and even then it may be alloyed with other easily fused metals, which are not volatile. Hence, the copper of commerce is not perfectly pure, but usually contains lead, and a very little antimony. Copper extracted from its carbonates is purer than that reduced from sulphurets, and a solution of the sulphate is purer than either, the precipitate formed from immersing iron in the solution, being afterwards fused. If the heat is increased above the point of melting, the copper evaporates in a thin invisible smoke, and while in fusion, the color of the surface is a rich bluish green. When exposed to air or moisture, it very gradually becomes covered with a green rust, which may be noticed on the sheets often enclosing the hulls of ships, and when heated red hot, it absorbs oxygen, and is superficially converted into a black oxide, which is the basis of the principal salts of copper, and consists of copper 32, and oxygen 8. It is detected when in very small quantities by the blueish color exhibited, by adding ammonia, and by brown precipitate, with ferrocyanide of potash.

Copper mines are wrought in many countries, but those of Sweden are said to produce the purest copper in market. The richest English mines are those of Cornwall, which are veins, traversing the primary rocks of that country. This copper is

smelted in Swansea, on account of the scarcity of coal about the mines. The mines of Lake Superior are every extensive and productive, and those of Bristol, Conn., worked by Cornish miners, tho' not extensively, are quite productive, and yield a good article, which is at present ground and smelted in England. Zinc was first discovered in 1520, is first mentioned by Paracelsus, and is often called spelter. It is also termed a semi-metal, because imperfect, and is obtained from calamine its native carburet, or from blende, its native sulphuret.—These ores are roasted, mixed with a carbonaceous flux, and placed in a crucible, or earthen vessel, from the bottom of which passes an iron tube, thro' which the vapor of the zinc is distilled downward, and condensed by water contained in a vessel outside the furnace, at the other end of the tube. At first this vapor emits a brown blaze, and contains arsenic, and often cadmium, but is collected when the blaze is blue. Its color, when cast into ingots, is a light lustrous blue, its texture lamellar and crystalline, its specific gravity 6.896, and after hammering 7.1908. At the common temperature of the air it is tough, and scarcely malleable, when heated to from 212° to 230°, it is ductile and tractable under the hammer, thus exhibiting properties which are remarkable, considering its texture, at 500° is brittle, and may be pounded fine in a mortar, and fuses at about 700°, before it is red hot. After it is once superficially covered with a black oxide, it resists the farther action of moisture, but occasions the rapid evolution of hydrogen gas when under water, if a little acid is present, or the zinc is impure, which causes it to be such a powerful generator of electricity, and so valuable in the voltaic pile. It is used in the curious art of transferring printing called xincography, is combustible for a short time at a moderate heat, but on account of the interference of the oxide which is formed, can only be burned up at a white heat when the vapor burns with a very intense white flame, and yields pompholix; a flocculent oxide, which floats in the air, and is often called philosopher's wool, or nihil album.

To return to our knife: the scales are formed from sheet brass by cutting it across the grain, into pieces as long as the knife, "slitting" these pieces with shears furnished with gauges, so that the grain may run lengthwise of the knife, both ends of each strip are perforated by a hand punch and hammer, on a block of lead or wood, and are then ready for the bolsters. These are cast from German silver, which is an alloy of copper, zinc and nickel, and is probably much the same as the Chinese "pack-fong," or white copper, though the latter is said by Dr. Fife to be a compound of iron, copper, zinc and nickel. Dr. Feuchtwanger, who first introduced and manufactured German silver in this country, "composed the alloy of one part of nickel one of spelter, and three of copper," and this well made is worth from \$1.25 to \$1.50 per pound, and prepared from pure metals will not tarnish, but is equal to sterling silver in whiteness. The refractory nature of nickel, and the difficulty of obtaining it free from arsenic, iron and cobalt, often make the silver of a yellowish color. The Doctor, however, disowns all fellowship with this yellow compound, which returns the manufacturer a good profit when sold for best German silver, at 75 cents per pound. It is sometimes an alloy of 7 parts zinc, 2.5 copper, and 6.5 nickel, and then more nearly resembles "packfong," if not the same material. Upwards of 50,000 lbs. of this compound is annually made in America, for which the nickel is imported from

Europe, as there are but three localities of nickel in this country; an ore from Chatham, Ct., yields about three per cent., and one from LaMotte, Mo., ten per cent. nickel, and it has lately been discovered among the copper mines of Lake Superior.—These ingredients are not easily made to mingle, and only unite when quite pure, and subjected to intense heat. The zinc, which is of a volatile nature, is not placed in the crucible till the other metals are well mixed. The compound is cast into ingots, rolled, or slitted and drawn into wire.

In 1836, Dr. Teuchtwanger petitioned Congress for permission to issue German silver cents, to the amount of \$30,000, as a substitute for copper currency. The proposition was strongly advocated by Messrs. Adams and Benton, and met the approbation of Mr. Van Buren, the President, and the members of Congress; but the director of the Mint said that the U. S. government had the exclusive right of coinage, and that it required much skill to analyse German silver: so the proposition of course "fell through."

Bolsters are cast from this metal, in moulds of sand, connected together in strips containing from four to twelve, but on account of the difficulty of properly melting and keeping it in a liquid state, but few can be cast in one piece, as it soon clogs, runs slowly and makes imperfect castings. A short thick pin is formed on the flat side of each bolster. The strips are filed on the edge which meets the covering, till even and straight, and then cut apart by a chisel. The hole of the scale end, is slipped over the pin of the bolster (which lies on an anvil) and this pin is partially riveted over the brass by a stroke of the hammer. When all the scales are supplied with bolsters, they are taken to another anvil, the bolsters laid separately in a steel boss (which is a small anvil with an indented surface), and hammered till the brass and silver are driven together as a solid piece, the pin completely riveted down over the scale, and the shape of the bolster perfected. In this state they are taken by the cutler. The middle scales are of brass, and the same as the side scales before the ends are perforated.—The shield is cut from very thin sheets of German or common silver by a "die,"—a mortice in a steel plate on which the metal is laid, and a "punch," which fits, and when pressed downward, carries the shield before it through the mortice.

The shell is the scale of a testaceous animal commonly called the tortoise, belonging to the genus testudo. All chelonian reptiles are distinguished by the peculiar armature, consisting of the upper and lower buckler united at the edges, and permitting only the head and tail to appear externally. The upper shell is called the carapace, and formed by eight pairs of ribs united by toothed sutures, and having bony plates adhering to the annular portion of the dorsal vertebrae, and so connected as to be motionless. The lower shell is called the plastron, and generally composed of nine portions, which answer for the sternum. There are many peculiarities in the structure of this animal, and Baron Cuvier says regarding it, "un animal retourne."—The chelonians respire by the play of the mouth, have no teeth, and but very limited powers of locomotion, and move with a slow awkward gait.—They are very tenacious of life, will live without food for years, and walk about for several weeks without any head. The most common of European tortoises is the Greek tortoise, which lives on fruits and insects, and sleeps thro' the winter. The scales are granulated in the centre, striated on the margin, and spotted with a rich black, or dark red, and

a transparent bright yellow. One has been known to reach the good old age of 120 years, when it died of neglect. The scales of this animal are taken off in sheets, and in this state they are imported. The sheets are sawn up into strips by the material maker, and are then ready for the cutter. Wire of any size is made by drawing strips of metal through a circular hole in a steel plate. These are the materials, and must be made up into knives by patterns, which consist of a steel "plate," shaped and drilled like the intended knife, a "fitting tang," shaped and drilled as the blade tang should be, and a "fitting spring," the end alone of which is the pattern. All these are hardened so as not to waste by a file. The materials are placed on a board, say 24 by 5 inches, with sides one half an inch high, which is termed the "knife board," and on which the work is kept and carried about.

The cutter's "side," as he terms it, is a bench from 5 to 6 feet long, and from 18 to 24 inches wide. A portion of the bench, 2 feet in length, is raised from 6 to 10 inches above the main bench, on the left end of which is a vice. A steel faced anvil, called a "steady," 4 inches high and 2x2 inches on the face, is set in the lower bench some 6 inches from the vice. The front surface of the steady projects one half an inch over the body, and has in it a mortice and a small circular hole. The hammers usually number 3, the largest of which weighs about 8 oz., the second 3 or 4 oz., and the smallest 1½ to 2 oz.; and those weighing only ½ oz. are occasionally used. The other tools and the mode of operation will be described in the next chapter.

For the American Railroad Journal.

In No. 14 of the current volume of the Journal, I gave a simple formula for obtaining a modulus of strength for bridge trusses, showing the greatest length to which a truss of any given materials, plan and proportions, could be extended before the full strength of the materials became exhausted by the weight of the truss itself, and affording a means of comparing the relative strength of different trusses and plans of trussing. The formula is $\frac{t+w}{l} \times l = \text{modulus}$, t representing the weight, and l the length of the truss, and w its breaking weight, or load.

Applying the formula to cast iron girders of a parallelopipedal form, I showed the modulus to be 1334, for a length of girder equal to 12 times its depth, and 1601, for a length equal to 10 times its depth.

For the English wrought iron tubular bridges and girders, according to Mr. Fairbairn's formula for the breaking weight, applied to the proportions of the Conway tube, the modulus is 1654.4.

To pursue the subject, a piece of straight grained white pine, one foot long and one inch square, will break with a uniformly distributed load of about 1000 lbs., and will weigh 3 ounces. Applying the formula, it becomes $\frac{3 \text{ oz.} + 1000 \text{ lbs.}}{3 \text{ oz.}} \times 1 \text{ ft.}$

=5334. Hence a clear straight beam of well seasoned white pine, with a depth equal to one-twelfth of its length, would bear its own weight at more than a mile in length.

But beams in those proportions cannot be obtained of more than 15 or 20 ft. without great expense, while beams of greater proportionate length possess so much flexibility as to be unsuited to the bearing of heavy loads, although their absolute strength is very considerable.

The loads which girders of the same breadth and depth of section can sustain, are inversely as the lengths, and the weights of such girders directly as the lengths. Hence the depth being the same, the modulus is inversely as the square of the length.—In the above case, then, the modulus for a beam of a length of 12 times its depth being 5334, the modulus for 24 times the depth is $4 \times 5334 = 1333$, and for 6 times the depth $4 \times 5334 = 21336$.

But my object is principally to consider the subject of *trusses*, composed of numerous pieces, proportioned, arranged and connected so as to form systems capable of bearing loads when simply supported at the ends, in the same manner in which girders or beams are commonly used, and secured from swaying or crippling laterally. I propose to apply my formula to the Howe truss, the plan being a prominent one, and familiar to engineers generally in this country.

I have seen no account of the breaking of a bridge or model of this kind by loading beyond the absolute strength of the materials. But by selecting certain important parts of known strength, and computing the distributed load necessary to produce a strain on those parts equal to their utmost ability to bear, of course the load so determined will be the true breaking weight, on the supposition that the parts selected are the weakest as compared with the service required of them.

I will take a truss of 150 feet, in the proportions usually adopted in those bridges, as nearly as I have the means of stating them; bottom chord 2 square feet, top chord 1.75 square feet in cross-section, and braces 7" by 8". Upright bolts, 2 of 1½ inch iron, once in about 10 feet, and cast iron butting blocks to receive the thrust of the braces.—Space between upper and lower chords about 18 ft.

Now, one pair of bolts at 10 feet from each end, contain about 7½ square inches cross-section in the four, besides what is cut away by the screw thread, and at 60,000 lbs. to the inch, can bear 60,000 $\times 7\frac{1}{2}$ = 450,000 lbs. And since these four bolts sustain the whole load, except one-half of what comes on the two endmost pannels, say one-fifteenth part of the whole, it is obvious that the capacity of those four bolts, increased by one-fifteenth part of the same, is a *limit* to the capacity of the truss, if it does not exceed it. Therefore the breaking weight for the truss in question does not exceed 450,000 $\times \frac{16}{15}$ = 480,000 = $t + w$.

Then, for the weight of the truss, t , say 45 braces and counter-braces, 20 ft. 8" $\times 7$ ", 4230 feet, b. m. Top and bottom chords..... 6750 Making say 11,000 ft. at 2½ lbs. 27,500 lbs. 30 bolts and nuts 20 ft., 1½" iron 175 lbs. 5,250 30 wrought plates under the nuts 15 lbs. 450 30 cast blocks 50 lbs. 1,500 Small bolts, etc., say 300

Total 35,000 = t .
The modulus then equals $\frac{480,000}{35,000} \times 150 = 2056$, or less.

A model truss of mine, 4 feet long, with a depth equal to one-tenth of its length, made of pine fastened with iron, and weighing nine-tenths of a pound, was tested with a load of 600 lbs., without breaking it, though it showed symptoms of yielding in the top chord, which was not so thoroughly staid laterally as it would be in a complete bridge. But taking 600 for the breaking load, the modulus

600-9
is $\frac{600-9}{0.9} \times 4 = 2670\frac{1}{3}$.

Now, though this modulus is about 30 per cent. greater than that obtained for the Howe truss, it will be observed that the latter has some 25 per cent. more relative depth of truss than the former, which is equivalent to 10 or 12 per cent. advantage in the modulus, besides that every thing uncertain in the data has been presumed in favor of the other, and adverse to mine, unless it be that *perhaps* the specific gravity of the timber in my model was less by a trifle than that of the other was estimated to be.

Rider's Iron Bridge.—The truss of this bridge has a top stringer and vertical posts of cast iron, with a bottom stringer and diagonals of wrought iron.

A three trussed model, six feet long, said to contain 18 lbs. of iron, including iron traverse beams and lateral bracing, failed in the centre truss with a load of 2000 lbs.

Now, allowing that the middle truss weighed 4 lbs. and bore half the above load, the modulus would be $\frac{1004}{4} \times 6 = 1506$.

The first bridge built by the N. York Iron Bridge Company over the Buffalo creek, on the same plan 160 feet long, broke with about 70,000 lbs., I believe, in addition to the weight of the iron and timber work of the bridge. I estimate the iron in the centre truss at about 25,000 lbs., timber work sustained by that truss 56,000, and half the load of 70,000 lbs., equal to 35,000—making altogether 116,000 lbs. = $t + w$. The modulus then is $\frac{116,000}{25,000} \times 160$

=742. Calculations made by me on examining the work, showed that the parts broken must have been subjected to a stress very nearly equal to the absolute capacity of the materials to bear. It was therefore a fair, and not an accidental failure. It is possible, however, that the load was not favorably distributed to enable the truss to act to the best advantage.

The new bridge at the same place, finished about a year ago, has 3½ square inches cross-section in the lower stringer, besides what is cut off by bolt holes. The stress upon the centre of this stringer is equal to one-eighth part of the distributed load, ($t + w$), multiplied by the length (160), and divided by the depth (15), of the truss. The stringer, moreover, may be assisted in the centre by one pair of diagonals on each side of the centre, possibly, and barely possibly, to an amount which is to the whole strength of two of those diagonals, as their horizontal run is to their length, or about as 2 to 3. And these diagonals, being 2" \times 1", the utmost assistance they can afford is equal to the strength of two square inches of iron, making the stringer, assisted to the utmost by the diagonals, equal 5½ inches, and capable of a stress of 5.75 \times 60,000 = 345,000 = $\frac{1}{4}(t + w) \times \frac{160}{15} = \frac{1}{4}(t + w)$, whence $t + w = 4 \times$

345,000 = 258,750. The modulus, therefore, estimating t at 35,000 lbs. equals $\frac{278,750}{35,000} \times 160 = 1182$.

A very high degree of accuracy cannot be claimed for these results, owing to a want of exactness in the data, but they may certainly be relied on as not very remote approximations to the truth, and it may safely be inferred that the Rider truss, as usually proportioned, has a modulus not exceeding from 1000 to 1500.

Trumbull's iron bridge of 80 feet, over the Erie canal at Frankfort, has in each truss two reversed

curve suspension rods of $1\frac{1}{4}$ inch iron, and a $1\frac{1}{4}$ in. rod running horizontally along the bottom of the truss. These three rods, with an aggregate cross section of about 4.76 inches, capable of a stress of $4.76 \times 60,000 = 285,600$ lbs., constitute the power of the positive or tension side of the truss; and the truss being about 7 feet high, the distributed load due to this amt of stress on these parts is $7 \times 285,600 = 2,000,000$, nearly, and equal to $t + w$, upon the not very probable supposition that the curved and horizontal rods can be adjusted to an uniform tension of 60,000 lbs. to the inch, and that this is the weakest part of the truss.

But the upper chord or stringer of cast iron pieces not stronger than square bars with a width of side equal to one thirty-sixth of their length, cannot, under the most favorable circumstances, be estimated as capable of bearing a negative strain greater than 30,000 lbs. to the square inch. The cross-section being about 6 square inches only, could not sustain over 180,000 lbs. pressure, requiring a load of 126,000 lbs.

Now the truss weighs probably at least 7000 lbs., and the modulus, therefore, would be $\frac{126,000}{7000} \times 80 = 1440$, and could not exceed $\frac{200}{7} \times 80 = 2285$, before

the positive side would be exhausted. The modulus, then, cannot reasonably be reckoned more than 1800.

This exceeds that obtained for the Rider truss.—But it is to be remarked that while the latter is well calculated to sustain the effects of an unequal distribution of load, the former is deficient in the necessary requisites to endure such conditions.

Now, the above appears to be about a fair index of what has been accomplished in the various essays at iron truss bridge building, (except mine) either in Europe or America, as far as the results have come to my knowledge. If any thing better has been achieved, I should consider myself obliged by being put in the way of becoming acquainted with the evidence of it.

But this comes very much short of what *may be*, and what I *have* done, with wrought and cast iron combined in bridge trusses. I have built some 20 iron bridges, from 25 to 100 feet in length, for both common roads and railroads, and the moduli of my trusses, estimated on more certain, and less liberal bases than have been assumed in the cases above considered, range from 3000 to 5000; and even these results fall considerable short of the utmost capabilities of those materials, under the most favorable circumstances.

S. WHIPPLE.

Utica, June 25, 1850.

From the Glasgow Practical Mechanics Journal.
A Chapter in the History of Railway Locomotion.

Continued from page 387.

After the conclusion of their investigations, and previous to the issue of their report, these gentlemen made application to Mr. Hackworth for particulars of the expenses connected with the maintenance of the locomotive engines of the Darlington line, and when the report appeared, it contained their well known decision in favor of stationary power.

Mr. Robert Stephenson was at this time carefully searching for evidence to support him in his opinion in favor of the locomotive system, in opposition to the report. A letter from him to Mr.

Hackworth, dated May 17, 1829, refers particularly to this question:—

"The reports of the engineers who visited the north, to ascertain the relative merits of the two systems of steam machinery now employed on railways have come to conclusions in favor of stationary engines. They have increased the performance of fixed engines beyond what practice will bear out, and, I regret to say, they have depreciated the locomotive engines below what experience has taught us. I will not say whether these results have arisen from prejudice, or want of information or practice on the subject. This is not a point which I will presume to discuss. I write now to obtain answers to some questions on which I think they have not given full information. Some of their calculations are also at variance with experiments that have come under your daily observation. For instance, they state it positively as their opinion, that a locomotive engine of 10 horse power, or say, of the usual size, will not convey more than 10 tons, exclusive of the wagons, at the rate of 10 miles per hour in winter time, and in summer the same engine will take $13\frac{1}{4}$ tons. The calculation is made on the assumption of the road being level. In answer to this statement, will you be kind enough to state at what speed your own engine returns from Stockton with a given number of empty wagons, and the rates of ascent? The whole ascent will do to get an average. State also at what speed the six-wheeled engine made by R. S. & Co. will return with any given number of wagons. What load, including wagons, will an engine, weighing 9 tons, including water, take at the rate of 10 miles an hour on a level well-conditioned railway? Let it be understood that all your statements are made under the supposition that the speed is to be maintained for 20 or 30 miles without stopping, except for water. Let me have your general opinion as to the locomotive engine system. Is it as convenient as any other? Would you consider $13\frac{1}{4}$ tons in summer, and 10 tons in winter, a fair performance for a good locomotive engine? You will oblige me much by answering the above questions as promptly as possible, as the discussion on the merits of the two systems is yet going on amongst the directors here."

The reply to the above letter, in answer to the several questions propounded, was the following:

"The statement you allude to, that a complete locomotive will take but 10 tons at 10 miles per hour, is quite at variance with facts: as an opinion merely, this I would forgive. Four of our wagons, laden for depots, frequently take from 12 to 13 tons of coals, exclusive of the wagons. Our engines never take less than 16 laden wagons in winter, and in summer from 20 to 24 and 32 laden, and can maintain a speed of 5 miles per hour, except in case of stoppages by means of horse wagons at the passing places. Engines thus loaded have frequently travelled at 9 miles per hour, sometimes more. It is unsafe to aim at speed upon a single line of railway, the danger is at the passing places. I am verily convinced that a swift engine, upon a well conditioned railway, will combine profit and simplicity, and will afford such facility as has not hitherto been known.

"I am well satisfied that an engine of the weight you mention, will convey, on a level, in winter, 30 tons of goods, 10 miles per hour, exclusive of carriages, and 40 tons in summer exclusive of carriages. The six-wheeled engine fitted up at the company's works; generally takes 24 wagons, 53 cwt. to 3 tons of coals each, speed 5 miles per hour,

empty wagons 24 cwt. each. The 6 wheels by R. Stephenson & Co.—20 wagons, 5 miles per hour, weight as above.

"As to my general opinion as to the locomotive system, I believe it is comparatively in a state of infancy. Swift engines upon a double way, I am convinced, may be used to the utmost advantage. Improvements upon anything yet produced, of greater importance in all respects, are clearly practicable; and I am sure this will prove itself by actual remuneration to such parties as prudently, yet diligently, pursue the execution of this kind of power, with their eyes open to those alterations and advantages which actual demonstration of local circumstances point out.

"Stationary engines are by no means adapted to a public line of railway. I take here no account of a great waste of capital. But you will fail in proving to the satisfaction of any one, not conversant with these subjects, the inexpediency of such a system. It never can do for coaching; passengers cannot be accommodated. If endless ropes are used, there will be both danger and delay. What provision can be made to answer the stretching of ropes? I have known a rope a mile and a quarter long, stretch 70 fathoms in one day. What set of apparatus will be found practically applicable to give the rope proper tension? Admit it to be possible, who would dare to be near when a mass of matter standing at rest, say 20 to 30 tons, is first put in motion by a rope, moving at the rate of 10 to 15 miles per hour?—It need not be added what will follow—a scene of endless confusion!

"I hear the Liverpool company have concluded to use fixed engines. Some will look on with surprise; but as you can well afford it, it is all for the good of the science and of the trade to try both plans. Do not discompose yourself, my dear sir; if you express your manly, firm, decided opinion, you have done your part as their adviser. And if it happen to be read some day in the newspapers—'Whereas the Liverpool and Manchester railway has been strangled by ropes,' we shall not accuse you of guilt in being accessory either before or after the fact."

There was still considerable indecision in the matter on the part of the directors, although considerable partiality was evinced by the major portion of them in favor of the locomotive, provided engines of this class could be built of sufficient power, whilst their weight was kept below that of the existing engines, some seven or eight tons; and in conformation with the railway act, requiring that no smoke should be discharged.

To distinguish accurately what was the cause of this favorable leaning of the directors towards the locomotive system, after the very opposite evidence which they had received, may, perhaps, be deemed a straining of the point; but there is good room for the presumption, that the evidence supplied by Mr. Hackworth, through Mr. Robert Stephenson, in the letter which we have quoted, had considerable influence in determining their choice. No other person had at this period anything like the practical knowledge which he possessed, in reference to the working of railways by both systems, the relative merits of which he had fully tested on the Darlington line.

One of the directors—Mr. Harrison—having given it as his opinion, that the expectancy of a reward, to be offered to the public as an excitement to competition, would have the desired effect—this mode of procedure was at length adopted; and, in April, 1829, they offered a premium of £500 for the

best locomotive engine, conformable with certain regulations and conditions. The story of the competition—in which Mr. Hackworth joined—with the results of the test of the different engines, has been often told.

It is to be regretted that Mr. Hackworth, as an agent of the Stockton and Darlington company, had not more extended means for the more perfect accomplishment of his designs; and that only such time as could be snatched from their service, could be devoted to his own plans. As the company's means were little more than adequate to the repairs of their own plant of engines, a great part of the work in his trial engine was executed at other establishments—the boiler being made at the Bedlington Iron Works, and the cylinders by Messrs. Stephenson.

The "Sanspareil" had a cylindrical boiler, 6 feet long, and 4 feet 2 inches diameter, one end being flat, and the other hemispherical. The heating surface consisted of a double tube traversing the whole length of the boiler, and returning to the fire end; the fire grate and chimney being both at one end of the engine—the fire grate in one tube, whilst the chimney terminated the other. The tube extended from the boiler to a length of about 3 feet, with a casing of a semi-circular form surrounding it at the fire end, except at the chimney, where this casing extended only 2 feet. With this arrangement, a greater extent of heating surface was obtained, than if tubes limited to the boiler's length had been used. The length of the grate bars was 5 feet, and the diameter of the tube at the fire end 2 feet, reduced to 15 inches in the return tube, this being also the size of the chimney. The area of the fire grate was ten square feet; the area of the surface of water exposed to the radiating heat, or direct action of the fire, being 15.7 square feet; and that acted on by the carried heat, 74½ square feet. She was carried on four wheels, four feet 6 inches diameter. The boiler was very imperfect as a piece of workmanship, and considerable leakage resulted. To such an extent were the joints defective, that many of them had copper run in and calked up to make them steam tight. Of the cylinders the same may be said—six castings were made before two perfect ones were got. The sixth cylinder had to be substituted at Liverpool, immediately after the contest at Rainhill, the fifth having burst during the competition. The imperfection in this case, was in the metal forming the partition between the bore of the cylinder, and the port way or steam pipe along the cylinder side, which had been cast and bored so thin in one part, as to leave less than 1-16 inch of metal. The consequence was, that the engine had no sooner commenced working than the cylinder burst, when the race had to be run with one perfect cylinder only. Whilst the fracture of the other one opened at every stroke a direct communication between the boiler and the chimney. Not only did this mal-adventure render the "Sanspareil's" case hopeless, by a tremendous loss of steam, but as each burst took place when the steam slide opened the communication with the injured cylinder, a great quantity of fuel was ejected from the fire grate. It is obvious that, under these circumstances, the "Sanspareil" had little chance against the "Rocket"—Messrs. Stephenson's engine—which was perfect in all its constructive details. As it was, the only superiority of the latter was in her economy of fuel. The trial run, indeed, was not of such a character as fairly to test the two engines—the distance being no more than 1½ mile. The blast pipe of the "Sans-

pareil" was fitted to enable her to maintain her working pressure during a long journey; whilst the "Rocket," unprovided with this appendage, was capable of generating steam as well when at rest as when in action. Thus the latter was enabled to get up a sufficiency of steam for her run, previous to starting, and when brought to stand at the stations, regained the steam power lost during the run, which was well performed on so short a distance as 1½ mile. This would not have been the case in the regular journeys of a working line.—Such a test, therefore, was practically worthless, in arriving at a due comparison of performance for a line of considerable length, like the Liverpool and Manchester.

To be continued

Terrestrial Magnetism.

When a magnetised needle is freely suspended by a silk thread at its centre of gravity, it will be found to point one of its extremities in the direction of the north pole of the earth. But at most places on the earth's surface its direction does not coincide, and therefore forms an angle with the geographical meridian. This variation from the geographical meridian is termed the *declination* of the needle. Moreover, it is only at a few places that its direction is in the plane of the horizon; it is generally found to point in a sloping direction towards the earth, and the angle of divergence from the horizontal plane is termed the *inclination*, or *dip*. Again, it is found that the needle is not everywhere attracted with the same energy. The intensity of total magnetic force, as it is termed, is measured by the power with which, when withdrawn from its position of equilibrium, it strives to return to it. The magnetic state of any place is not deemed determined until these three elements—the declination, inclination, and intensity—are precisely ascertained. It has been estimated by Gauss that the total magnetic power of the earth, compared with that of a saturated steel bar, 1 lb. in weight, is as 8,464 millions to one; and supposing it to be evenly distributed, the force in every cubic yard of the earth's mass will be equivalent to that of six such bars.

1. *Declination*.—There are certain points on the globe where the direction of the needle exactly coincides with the geographical meridian, and lines which connect such points with each other are termed *lines of no declination*. Lines which connect points where the needle is deflected by the same angle from the geographical meridian, are called *isogonic lines*. Such lines on a sphere, which may be termed magnetic meridians, are curves of double curvature. They are not parallel with each other, but are bent into unaccountable flexures. Most of them are found converging towards a point in each hemisphere—one being near Baffin's Bay, and the other to the southward of Van Dieman's Land. The changes of declination in sailing along some geographical meridians is so rapid, that it has been proposed, where the indications of the chronometer cannot be trusted, to determine the longitude by means of the compass. Sir James Ross, whilst voyaging in the Antarctic Ocean, once noticed a change in the declination from 114° west, in a space of about 360 miles.

2. *Inclination*.—A line drawn through those points where the needle's direction is parallel with the plane of the horizon is termed the *line of no dip*, or the magnetic equator. It forms a curve of double curvature, and, cuts the earth's equator at two places. To the north of this line the needle inclines its northern extremity more and more, until, at the north magnetic pole (70° north latitude, and 95° 39'), it points vertically downwards. On the other hand, to the south of this line the southern extremity of the needle is pointed towards the earth, and at the south magnetic pole (75° 5' south latitude, 154° 8' east longitude), it is again in a perpendicular position. "As we approach the magnetic equator," says Sir James Ross, "our observations relative to this interesting question were more frequent. We had watched the progressive diminution of the dip of the needle, and, steering a course as nearly south as the wind permitted, in order to cross the line of no dip at right angles, we found the change so rapid as to be ascertained with

great precision; so much so, that the signal for our being on the exact point of no dip—where the needles, being equally poised between the northern and southern magnetic systems, assumed a perfectly horizontal position—was being hoisted from both ships at the same instant of time. It could not fail to be of more than ordinary interest to me to witness the needle thus affected, having, some years previously, when at the north magnetic pole, seen it in a directly vertical position; nor was it unnatural, when we saw the south pole of the needle beginning to point below the horizon, to indulge the hope, that ere long we might be permitted to see it in a similar position at the south magnetic pole of the earth. The regularity as well as the rapidity with which the alterations of dip occur is also worthy of notice. At 280 miles north of the magnetic equator, the dip was 9° 36', showing about 2.05 minutes of change for every mile of latitude; at 292 miles to the south, the dip was 9° 52', or about 2.03 minutes for every mile of latitude. It is to be remembered that this large amount of change is limited to the region of the magnetic equator; near the poles it requires an approach of about two miles to produce an alteration of a single minute of dip." The magnetic poles, it will be noticed, do not coincide with the geographical poles. Lines which connect points, where the dip of a needle is the same, are termed *isoclinical lines*.

3. *Intensity*.—It was formerly supposed that the intensity of the force which determines the magnetic declination and inclination is at a minimum, where the dip of the needle is zero, i. e., where the needle is parallel with the plane of the horizon.—But this is not the case; and hence, since Humboldt selected the magnetic intensity at a certain place in Peru, where the needle took a horizontal position as the unit measure, it has become necessary, when his scale is adhered to, to employ expressions less than unity to denote the intensity at many places where the magnetic force is more feeble, although the deviation from the horizon is greater.

Researches, says Sabine, into the amount of the magnetic forces at different points of the earth's surface, the graphical representations of the results by lines drawn through the points where the force has an equal intensity (*isodynamic lines*), have shown that there are two foci, or points of maximum force, in each hemisphere, and consequently four on the whole surface of the globe. The isodynamic lines which surround each of the two points of maximum in a hemisphere are not circles, but are of an ovate form, having the larger axis in a direction which, if prolonged, would connect the two foci by the shortest line, or nearly so, which can be drawn between them on the surface of the globe. As the ovals successively recede from the focus, they correspond to weaker and weaker degrees of force, each in its turn enclosing the ovals of higher intensity. This continues to be the case until the two systems of ovals encounter in a point intermediate between the foci. The isodynamic line which corresponds to the force at this point, has, consequently, the form of a figure of 8, each of the loops enclosing a focus with its surrounding ovals. This form is called by geometers a lemniscate. There is but one such isodynamic line in the extra-tropical part of each hemisphere, and it separates the isodynamics of higher intensity than itself which are within the loops, each surrounding a single point of maximum only, from those which correspond to weaker degrees of force than that of the lemniscate, and are exterior to it. Each of the exterior isodynamics surrounds both the foci, but without meeting or crossing in the point between them. Their general form is that of parallelism with the external figure of the lemniscate, but the inflections which produce the double loop become progressively less marked in the isodynamics of weakest force.

If the two foci in a hemisphere (continues Sabine) were points of equal force, the ovals surrounding each would be similar in force and area, and the point at which the two systems would encounter each other would be half way between the foci. Such, however, does not appear to be the case. The intensity at one of the foci is greater than at the other; it is so in both hemispheres, and the ratio of the force at the major and minor focus appears to be nearly the same in both. The two

major foci—one in the northern, the other in the southern hemisphere—are not at opposite points of the globe to each other, nor are the two minor foci. The foci in each hemisphere are not separated from each other by an equal number of degrees of geographical longitude; they are nearer to each other in the southern than in the northern hemisphere.

None of the foci of maximum intensity is coincident with the spot in which the direction of the needle is vertical. In the northern hemisphere, the geographical position of the focus of maximum intensity is in latitude $52^{\circ} 19' 3''$, longitude $268^{\circ} 0' 1''$.

In passing from the north to the south magnetic hemisphere, there is upon every meridian a point up to which the intensity gradually diminishes, and from which, in continuing a southward progress, it begins to increase. The line uniting these points is one of various inflection, and in it occurs the point of minimum total intensity, or the place whose magnetic intensity is exceeded by that of every other place on the earth's surface.

The mode of measuring the magnetic force in parts of an absolute scale, instead of in Humboldt's manner, has of late been adopted in consequence of its enabling present determinations to be compared with future ones. In this scale the unit of force is that amount of magnetic force required to generate the unit of velocity in the unit of mass during the unit of time. If a British foot, grain, and second, be taken to represent these units, the ratios of force at the major and minor foci in the northern hemisphere are 13.9 and 13.3; in the southern hemisphere, 15.6 and 14.8. At St. Helena, which is nearly in the line of least intensity, the value of the force is 6.4.

Variations in the Position of the Needle and in the Intensity of Magnetic Force.—Such variations as depend upon changes of place have been already mentioned, but there remain to be noticed those variations which have reference to time.

Periodical Movements.—In every 24 hours the needle is found to make two deviations to the eastward, and two to the westward, of its mean position, those which take place in the day being greater than those occurring in the night. The extent of the deviation is greater in summer than in winter. Finally, a fluctuation having an annual period has been discovered. The angle of dip has been found to vary in a similar manner; and the intensity of total magnetic force is likewise subject to fluctuations of the same character. These fluctuations are attributed to electric currents caused by changes in the amount of heat communicated by the sun to the earth and its atmosphere.

The amount of diurnal variation decreases as the magnetic equator is approached.

The diurnal variations in the southern hemisphere are in a direction opposite to those in the northern. Hence it was thought probable that there might exist a line where these diurnal variations are no longer observable. But it appears from observations, made at stations which were suitable for determining the question, that those variations, which are peculiar to each hemisphere, prevail at opposite seasons of the year, apparently in accordance with the position of the sun with relation to the earth's equator.

Secular Variations.—In the periodical displacements, the movement of the needle at one time is compensated by a counter movement at another.—But it has been found that, after allowing for movements of short period, there still remains a small displacement of the needle, by which its mean position is slowly advancing in one direction. Hence all the magnetic curves are slowly but regularly changing over the whole surface of the earth; they are sweeping round upon the two hemispheres in contrary directions. The points of similar intensity are being disturbed along with the rest; and, from comparing the observations of Sir James Ross in the Atlantic with earlier observations in the same ocean, it would seem that the line of least intensity has been there moving northerly, during the last fifteen years, at the rate of rather more than thirteen miles annually.

In addition to the periodical and secular movements, the needle is subject to irregular perturbations, which—when of a sudden and violent nature, as they frequently are—have received the name of *magnetic storms*. Sometimes the pertur-

bations are scarcely perceptible; but at others, the needle gradually moves without oscillation over several degrees to some fixed point, from which it will return in the course of a few minutes. On some rare occasions, the needle is capriciously agitated in a peculiar way. These disturbances are simultaneously propagated over vast regions; they have been synchronously observed over the whole surface of the globe, so that the needles in observatories thousands of miles apart are seen mysteriously to tremble at precisely the same moment.—The synchronism of the perturbations, however, is not confined to the larger and extraordinary changes, but even the minutest deviation at one place of observation has its counterpart at another.

Hypothesis of Terrestrial Magnetism.—One hypothesis regards the earth itself, as intrinsically magnetic in the sense that a loadstone is magnetic; but, in this hypothesis, it is difficult to account for the secular variations of the magnetic curves. Another hypothesis assumes that the seat of the earth's magnetism, if not entirely atmospheric, is at least so far superficial, as to be subject to external influence to a large amount, and the magnetic curves bearing no relation to any fixed lines in the globe, or to any determinate directions in external space. It is to be noticed, that Professor Barlow was able to imitate, on an artificial globe, most of the phenomena of the magnetic needle, by passing electro-magnetic currents round its surface.

Terrestrial magnetism, in its present state (says a Report of the Council of the Royal Society,) subdivides itself into two chief branches, which bear a certain analogy to the theories of the elliptic movements of the planets, and of their periodical and secular perturbations. The first comprehends the actual distribution of the magnetic influence over the globe at the present epoch, in its mean or average state, when the effects of temporary fluctuations are either neglected or eliminated, by extending the observations over a sufficient time to neutralize their efforts. The other comprises the history of all that is not permanent in the phenomena, whether it appear in the form of momentary, daily, monthly, or annual change and restoration, or in progressive changes, not compensated by counter changes, but going on continually accumulating in one direction, so as, in the course of many years, to alter the mean amount of the quantities observed. These last mentioned changes hold the same place in the analogy above alluded to with respect to the mean quantities and temporary fluctuations, that the secular variations in the planetary movements must be regarded as holding with respect to their mean orbits on the one hand, and their perturbations of brief period on the other. There is, however, this difference, that in the planetary theory, all these varieties of effect have been satisfactorily traced up to a single cause, whereas, in that of terrestrial magnetism, this is so far from being demonstrably the case, that the contrary is not destitute of considerable probability. In fact, the great features of the magnetic curves, and their general displacements and changes of form over the whole surface of the earth would seem to be the result of causes acting in the interior of the earth, and pervading its whole mass; while the annual and diurnal variations of the needle, with their train of subordinate periodical movements, may, and very probably do, arise from, and correspond to, electric currents produced by periodical variations of temperature at its surface, due to the sun's position above the horizon, or in the ecliptic modified by local causes; while local or temporary electric discharges, due to thermic, chemical, or mechanical causes, acting in the higher regions of the atmosphere, and relieving themselves irregularly or at intervals, may serve to render account of those unceasing, and, as they seem to us, casual movements, which recent observations have placed in so conspicuous and interesting a light. The electro-dynamic theory, which refers all magnetism to electric currents, is silent as to the cause of those currents, which may be various, and which only the analysis of their effects can teach us to regard as internal, superficial, or atmospheric.

Backwardness of the Cotton Crop.

We find in the Savannah Republican a table giving the date of bloom and frost, with the crop of each season, from 1836 to date.

	Date of bloom.	Date of frost.	Extent of crop.
1836	4th June	14th Oct.	1,432,000 bales.
1837	7th May	27th Oct.	1,800,000
1838	14th June	7th Oct.	1,360,000
1839	24th May	7th Nov.	2,117,000
1840	6th June	17th Oct.	1,630,000
1841	10th June	15th Oct.	1,683,000
1842	17th May	1st Nov.	2,379,000
1843	12th June	15th Oct.	2,030,000
1844	31st May	30th Oct.	2,394,000
1845	30th May	3d Nov.	2,100,000
1846	10th June	1st Nov.	1,900,000
1847	29th May	27th Nov.	2,348,000
1848	30th May	20th Nov.	2,700,000*
1849	15th June	10th Dec.	2,100,000

* 200,000 bales left over from preceding seasons.

A late bloom has been invariably followed by a short crop. The bloom of 1849 was one day later than any on record, and although the frost held off until December, giving the planters one of the finest picking seasons on record, yet the yield was reduced six or seven hundred thousand bales.

From present indications the bloom will scarcely make its appearance, in a majority of fields before the close of the month. The unprecedented lateness of the crop this season, with the continued drought, precludes all hope of a crop even approaching that of last year.

Steam Explosions and Evans' Safety Guard.

We extract the following from the report of the Commissioner of Patents, read in the Senate of the U.S. at its last session. It is in reply to a communication from the commissioners on the subject of steam boiler explosions; and the reply of Mr. Gray bears such strong testimony in favor of Evans' safety guard, that we would be wanting in duty to the public, and regardless of justice to our fellow townsman, not to publish it. We have all along believed that this invention would survive the storm of persecution with which it was at first assailed, and that justice, slow but sure, would be eventually extended to it by the great body of our engineers and practical men. The invention has been improved by Mr. Evans, in many material points. "The fusible alloy, used in the 'guards,' cannot harden by use. It makes no difference how long in use, or how much exposed to heat, it cannot lose its property of fusion, and will not require a greater degree of temperature to melt it than at first designated. We learn that Mr. Evans has devoted the last three or four years to the attainment of important improvements, and that the guard now presented to the public challenges all objections.—We hope that such toil and perseverance, devoted to so noble an object, will meet with due reward, and that our engineers will cast aside all prejudices, and extend the hand of friendly regard to this beneficent improvement:

CUSTOM HOUSE OFFICE, St. Louis.

Sir—In answer to your interrogations, I respectfully answer in their order, &c.

In the year 1841, I built a boat in Pittsburgh; the boilers had been used in another boat. At the earnest solicitation of Capt. May, of that city, I had placed on those boilers "Evans' safety valve," at the time, much against my own judgment. A year or so after, when running the boat, from the darkness of the night, it became necessary to lay up. On retiring to bed, I gave orders to the engineers to have steam up by daylight; the engineer, as I afterwards learned, passed the order to the watchman, and went to bed also.

The watchman, sometime before daylight, fired up, and raised steam before it was yet light. The old safety valve in due time commenced to blow off steam. The man in charge tied it down to prevent the noise, and not being capable of working the engine so as to supply the boilers with water, the steam increased rapidly, and Evans' valve went off and gave the alarm to myself and the engineer.—As soon as I ascertained the cause of the escape of steam, I caused the fires to be cooled down, and the man head was taken out of the boiler to ascertain the fact if Evans' valve could be relied upon or not. On examining the water, after the

man head was taken out, I found the water had sunk in the boiler to a stage below what was safe, which was the cause of the explosion by Evans' valve, and I believe, had not the valve been upon the boilers, they would have blown up.

I have known other circumstances occurring on boats on which this valve was placed, and I am firmly of opinion, that when Evans' valve is left free to act, no explosion can occur on boats.

Very respectfully, &c.,

THOMAS GRAY,

Surveyor and inspector,

To COMMITTEE OF PATENTS,
Washington City.

We cannot understand why, for several years, this invention has been completely overlooked and allowed absolutely to go out of use when its value as a safeguard is altogether above doubt or question. Our own opinion has been fixed and firm in its favor, and we are confident that if the public attention can be directed to it, it will be brought into general use.

Railroad Economy.

We have given a hasty perusal to the new work of Dr. Lardner with the above title. In many respects it is an interesting rather than a useful work. It gives a minute account of the workings of European railroads, particularly those of England, the country in which these works have been pushed to a greater extent than in any other, and where at the same time the greatest losses have been sustained from their mismanagement. Tho' the general scope of the work is a history of railroads, and their influence upon the wealth and prosperity of a country, yet it contains much useful matter upon the management, which, tho' not new, cannot be too often repeated. The extraordinary depression of railroad property in England, is not, in our opinion, attributable so much to their mismanagement after they have gone into operation, as in their mismanagement prior to this, which so enormously adds to their cost, and from which we are entirely free in this country. The following extract which gives a pretty good idea of the character and style of the work is as well worthy the considerations of the companies here as in England. We shall recur to this work again in our next number.

Let us endeavor to convey to the unpractised reader some definite idea of this enormous speed of locomotion.

Seventy miles an hour is, in round numbers, 105 feet per second; that is to say, a motion in virtue of which the passenger is carried over 35 yards between two beats of a common clock. Two objects near him, a yard asunder, pass by his eye in the thirty-fifth part of a second; and, if 35 stakes were erected at the side of the road, a yard asunder, these 35 would pass his eye between two beats of a common clock, and it is scarcely necessary to say that they would not be distinguishable, the retina not being capable of receiving distinct successive impressions in so minute a fraction of time. If the stakes had any strong color, such as red, they would have the appearance of a continuous flash of red color. At such a speed, therefore, the objects on the side of the road are undistinguishable.

When two trains having this speed pass each other, the relative velocity will be double that, or 70 yards per second; and if one of the trains were 70 yards long, it would flash by in a single second. It will be somewhat curious to investigate the movement of the mechanism of the engine, which produces this extraordinary speed.

Let us suppose that the driving wheels of the engine are about 7 feet in diameter, and, consequently, that they measure a little more than 21 feet, or 7 yards in circumference. These wheels would revolve five times in passing over 35 yards of the rails; and as this space is, on the supposition we have made, passed over in one second, these driving wheels must, necessarily, at such a speed, revolve five times per second. Now, to produce one revolution of the driving wheels, each piston must

once pass backward and forward in the cylinder, and its motion, therefore, must divide a second into ten equal parts. On arriving at each end of the cylinder, at the moment it is about to change the direction of its motion, and to return, a valve must be shifted by which steam may be admitted on one side of the piston and withdrawn from the other side. This valve must therefore also be moved ten times per second, and must complete its motion so rapidly as to form but a small fraction of the entire stroke of the piston, and therefore its motion must be computed by a small fraction of the tenth part of a second, and this must be done with the utmost punctuality and uniformity, otherwise the action of the piston could not be continued. The cylinder discharges its contents through the escape valve every time that the piston changes its direction, and consequently this discharge must take place, under the circumstances here supposed, ten times per second.

But there are two cylinders, and the mechanism is so regulated that the discharge from the one is intermediate between two discharges from the other. There are therefore 20 discharges of steam per second, at equal intervals; and thus these 20 puffs divide a second into 20 equal parts, each puff having the twentieth of a second between it and that which precedes or follows it. The steam which thus puffs from the cylinders is conveyed by a pipe to the chimney, where it escapes upward in a succession of blasts, by which the draft through the fire place is maintained. It is these blasts of steam in the chimney which produce the coughing noise heard when a locomotive engine is moving slowly. As the rapidly augments, these coughs become more rapid, and when the speed attains the amount which we have supposed above, there will be 20 coughs per second. The ear, like the eye, is limited in the rapidity of the sensations of which it is susceptible, and active and sensitive as that organ is, it is not capable of distinguishing sounds which succeed each other at intervals of the twentieth part of a second; therefore, when the engine moves at such a rate, the puffing in the chimney ceases to be appreciated by the ear, although, as a mechanical effect, it continues to be produced as accurately and regularly as when the engine is moving slowly.

According to the experiments of Dr. Hutton, it appeared that the time of flight of a cannon ball, having a range of 6,700 feet, is one quarter of a minute.

The velocity was therefore 26,800 feet per minute, which is equal to five miles per minute, or 300 miles per hour.

It follows, therefore, that a railway train, moving at 75 miles an hour, not an uncommon speed for express trains to attain, would have a velocity only four times less than a cannon ball.

The momentum of such a mass, moving at such a speed, is difficult to conceive. It would amount to a force equivalent to the aggregate force of a number of cannon balls equal to one-fourth of its own weight.

The consideration of the great damage done to the railway, as well as to the rolling stock, by these extreme speeds, is a serious drawback to the gratification which such wondrous performances naturally excite. The fracture and wear of rails is augmented in a very high ratio with the speed; so likewise is the wear of all parts of the vehicles most affected, such as wheels, axles, &c.

I have shown that, at the speed we have here considered, a driving wheel, 7 feet in diameter, revolves 5 times per second; but the bearing wheels of carriages, wagons, and vans are in general only 3 feet in diameter, and sometimes even less. Now, if a wheel of 7 feet in diameter revolve 5 times per second, a wheel 3 feet in diameter, proceeding at the same speed, must revolve very nearly 12 times per second.

This, therefore, is the action which must take place upon all the wheels of the vehicles composing each express train.

The expense attending such extreme speed is not, however, limited to the cost which attends the trains themselves to which this motion is imparted. The whole traffic of the road is more or less affected by it. All other trains must be hurried forward to get out of the way of the express train, or detained in sidings to wait for its passage.

From these causes goods trains, which need not and ought not to move at a speed of more than 16 or 18, are frequently compelled to be driven at 30 miles an hour and upward. Their average speed is made up by undue speed when in motion, for the time lost waiting in sidings for the progress of express trains.

The damage done to the road by these causes is not merely that which arises from the undue speed which must occasionally be given to heavy goods trains; great damage is also done by the frequent stoppages of such trains. When they are stopped, their momentum must be spent upon the rails; and when they are put in motion afterward, and momentum imparted to them, the reaction produced by their driving wheels on the rails is another cause of most injurious wear and tear.

Railway directors and managers are deeply sensible of the great damage sustained by the property under their care in consequence of these circumstances, and frequent murmurs and remonstrances are heard upon the subject. The public, however, appear to be too exigent to be successfully resisted. I have no doubt, from long and careful practical investigations into the effects produced by the action of engines and carriages on railways, that the damage sustained directly and indirectly by railway proprietors in consequence of express trains moving at this extraordinary speed, is far greater than any profits derivable from such trains can cover; and I have no hesitation in saying, that, considered in a commercial point of view, railway proprietors would be fully justified, either in laying a much higher rate of fare upon express trains, or, which would be much more advisable and more consistent with their own interests, suppressing them altogether.

Missouri.

The Pacific Railway.

It has been heretofore announced that the surveys upon this work commenced from this city westwardly on the 24th of May. The party then sent out, we understand are progressing very well, and have found a very good route, much better than was anticipated, the maximum grade not exceeding 35 or 40 feet to the mile. This party are now running a line that shall be the cheapest and most direct to Jefferson city, and are now about 30 to 40 miles west of this city.

In order to start the surveys on the western division, commencing at Jefferson city and running westwardly to the western border, the President of the company, with the Chief Engineer and a party of assistants, embark to-day, we understand, for Jefferson city.

The people of Jefferson city and the corporate authorities of Cole county will now be called upon to show their patriotic spirit in affording encouragement and aid to this work. They may be assured that those who have charge of the affair are zealously in earnest, and intend to put the railroad through if means enough can be got. The corporate authorities of all the counties along the route will be called upon, and, by the charter of the road, all, through which the road may pass, are authorized to subscribe.—*St. Louis Intelligencer.*

South Carolina.

Greenville and Columbia Railroad.—The Charleston Mercury says: "We are gratified to learn that the energetic President and his able Engineer are making rapid progress with this important work. The road is now finished and open for the accommodation of travellers for twenty three or twenty four miles above Columbia. The company have supplied themselves with engines and very handsome passenger cars, which leave Columbia daily, and we learn that on and after the 20th inst., accommodation coaches will be run regularly from the road to Newberry C. H., from which point to

Greenville C. H. the roads are at all times in good order. It is expected that in a few weeks the road will be completed to the bridge across the Broad river, from whence we understand Messrs. Douglass and Ward, the accommodating proprietors of the stages, propose to run a passenger coach thro' to Glenn Springs daily. We trust that the company will begin at once to realise the benefits of their enterprise, and that our citizens who propose leaving Charleston during the summer months, will take this course, leading to our own mountain region, than which no more delightful summer climate can be found anywhere."

AMERICAN RAILROAD JOURNAL.

Saturday, June 29, 1850.

Railroads in the West.

The rapid progress of the great leading lines of railroad from the Atlantic cities west, gives those links which are necessary to connect them with each other, or with the Mississippi, the immediate goal of all, an importance which they would by no means possess but for the relations they thus sustain. The great trunk lines from New York, Philadelphia and Baltimore are certain of being speedily constructed to the western line of Indiana. Illinois, now presents obstacles to the construction of roads upon routes demanded by the business of the country, but the obstacles we are confident will soon be removed, and her citizens allowed to build these works wherever it shall be for their interest to do so. The completion of the New York and Erie, the Pennsylvania Central and the Baltimore and Ohio railroad, will give an increased impulse to the lines which are to carry them forward to the Father of Waters, as they will find it for their interest to extend the necessary aid for their speedy construction.

The cities of Savannah and Charleston are soon to be united by railroad with Nashville, the capital of Tennessee. The Georgia roads have already reached Chattanooga, which is 432 miles from Savannah. The Nashville and Chattanooga railroad is in a state of forwardness, and will soon be opened. Nashville is 159 miles from Chattanooga.—From the former place to Henderson, Kentucky, it is only 130 miles. Henderson is opposite Evansville, the Southern terminus of the great Indiana Canal, which is nearly completed, and is to extend from that place to Lake Erie by a line of 450 miles. From Evansville, a railroad is in progress in the direction of Indianapolis, where are to centre all the roads from the north, including Baltimore. All that will be wanting in a short time to connect the roads of the north and south, and those of the latter with the lake, will be the link between Nashville and the Ohio. This then becomes a conspicuous portion of this great interior line. Its construction is necessary to give symmetry to the whole.

A very favorable charter for this road has been granted by the States of Tennessee and Kentucky. The whole cost of the road has been estimated not to cost over \$10,000 per mile. It traverses the most fertile and richest portions of these States, and we learn that those interested in the road as a local work, have abundant means to build it. There is certainly no part of the west where a railroad is more necessary. We hope to see the importance of this work appreciated by the people along its proposed line. There is no way in the world by which they can make money so fast as to build this road, and no way in which they can so surely elevate their social condition as by securing to themselves the means of cheap and rapid locomotion,

which will give them both the means and the opportunity of visiting other parts of the country far and near, and of being visited in return.

Steam Communication Between the Great Lakes and the Mississippi.

It is well known that the Wisconsin and Fox rivers, in the State of Wisconsin, approach at one point within two miles of each other, the former falling into the Mississippi, and the latter into Lake Michigan. The land which separates these rivers at their nearest approach is so low as to be overflowed at high water, and the rivers are then united. The Wisconsin is navigable to this point without any improvement. The Fox river is obstructed by rapids which have thus far prevented its navigation by steam. These obstructions are but few in number, and easily surmounted. The State of Wisconsin, by aid of grants of land from the general government, has been for some time past engaged in removing the obstructions, and constructing locks and canals by the rapids, and steamboats will soon run from Lake Michigan to Lake Winnebago, a fine sheet of water about 30 miles long, and surrounded by one of the most beautiful countries in the world. By another season the whole work of improvement will be completed, and steamers will run from the Mississippi to the Lakes with full cargoes.

The above bids fair to become one of the most important public improvements ever made in the United States. The connecting the great Lakes and the Mississippi river by a route navigable by steamers must form an era, even in our present advanced state of internal communication. A boat may then load at Buffalo for the Falls of St. Anthony, the Yellow Stone, or New Orleans. The products of the great Mississippi valley will have a direct and cheap route to the Atlantic cities by way of the Lakes. Emigrants may then embark at Buffalo or Oswego, and be carried by the same steamer to the spot where they wish to settle. A new impulse will be given to the commerce of the country, and the bonds of our union made the stronger by the opening of this new route which is soon to rival all other artificial lines of water communication opened in this country.

East Tennessee and Georgia R. R.

This company has made such progress, that they are now in our market to purchase iron and the equipment for the first eighty miles, which will carry the road to the Tennessee river. To purchase the above articles the company have the bonds of the State of Tennessee for \$350,000. The road will be in readiness for the iron as soon as it can be received.

Ohio.

Sandusky and Mansfield Railroad.—The work upon the extension of the Mansfield and Sandusky city railroad from Mansfield to Newark, is going on with rapidity. The company is now laying the iron at each end of the route at the rate of about half a mile per day. The road is to be completed to Belleville, 13 miles south of Mansfield, by the 4th of July, and by the 1st of September the company expect to meet the other division at Mt. Vernon, and celebrate the completion of the road to Newark in time for the fall trade.

New York.

Albany and Rutland Railroad.—The whole amt necessary to secure the construction of this road, with the exception of a hundred and fifty thousand dollars, has been raised.

From the Lake Superior Copper and Iron Region.

Minnesota Mine.—The Lake Superior Journal of June 19th says this company's vessel, the Fur Trader, came in on Saturday last with 26 tons of native copper in masses, some of which weigh over 4,000 lbs. There are many other pieces out much heavier ready to be shipped down, and every day brings to light new masses of this kind. The prospects of this mining company are of the most encouraging character, bidding fair to soon rival the noted "Cliff" at Eagle river.

The same paper states that several tracts of land have lately been entered by persons about to engage in the manufacture of iron on a large scale. This is now carried on to quite an extent. The Journal says that the Jackson Iron Company at Carp river, shipped down by the Propeller Napoleon on her last trip about 40 tons of their iron, in blooms. This fine article of iron is to be taken to Pittsburgh for sale, and, in the very heart of Iron-dom, it will doubtless command the highest price. It has now been thoroughly tested by every manner of use, having been drawn into card-teeth wire with perfect satisfaction, manufactured into a good article of steel, and used with success wherever a fine article was necessary.

It was thoroughly tried, for heavy iron work, by Messrs. Ward, and was pronounced superior to the best article heretofore used. The Jackson Iron company are the pioneers in the manufacture of this iron, and they are now likely to receive a rich reward for their perseverance and investment.—Now that the expenses of manufacturing blooms and conducting the business has been ascertained, and its superiority over all other in the country has been established, they mean greatly to enlarge their works and extend their business. They intend putting on a large force of men, and erecting new furnaces the present season, and we doubt not, will make large shipments of blooms before the close of navigation.

This location embraces a large portion of the Iron Mountain and contains a sufficient quantity to supply the whole country for centuries. It is piled up in irregular stratified masses, easily split or broken up with a crow bar and sledge hammer;—and one may break and throw together fifty tons of this ore in one day. To make bar iron from this ore is a cheap and simple process, and the day is not far distant, when the markets around the whole chain of lakes will be supplied with their best iron from the Iron Mountain of Lake Superior.

Georgia.

Milledgeville and Gordon Railroad.—We learn that all the preliminary arrangements are now made for the completion of this road. At a recent meeting of the stockholders of this company, the directors were requested if practicable, to have the road in operation by the 1st of January next.

Indiana.

There is hardly a State in the Union doing more in railroads than Indiana. A few years only will elapse before every farmer will be within a convenient distance of one. Several of the roads have recently concluded purchases for their iron, or are now negotiating for this article—the Lafayette and Crawfordsville, and the Evansville and Mt. Carmel among others. A number of branch roads, and the Peru and Indianapolis we believe are laying a flat bar, which had either been used or purchased for other roads. A number of other compa-

nies will soon be in the market for their iron and equipment. Two years more will place this State in the rank of the leading railroad States of the Union.

New York.

Ogdensburgh Railroad.

We have received the last annual report of this company. As is well known, the road commences at Ogdensburgh, at the foot of navigation of the great lakes, and extends entirely across northern New York, terminating at Rouse's Point, on Lake Champlain. Its whole length is 117½ miles. Forty-five miles are now open, and well supplied with engines and cars. The rails are now being laid from Ogdensburgh east, as rapidly as practicable, and another force will be employed in a few weeks in laying them on the middle division. It is expected that the entire track will be ready for use in the month of October next, and arrangements have been made to have it furnished with engines and cars sufficient to do all the business that may be offered at its opening.

The whole amount expended in construction, on the first day of May, including interest paid to the stockholders, and on loans, was.....\$2,032,000
The amount paid for engines and cars. 92,000

Making a total expenditure, at that time, of..... 2,124,000
The amount required to complete the work is..... 1,036,000
And for additional engines and cars to operate the whole road when opened. 168,000

Making the total cost of road, engines, cars, and fixtures, at its opening.....\$3,328,000

Which sum includes the interest already paid to bond and stockholders, and on loans, but does not include any interest to accrue hereafter.

The capital of the company is.....\$2,000,000

[The whole amount was subscribed for before its organization, and five per cent paid thereon. From various causes this subscription will be reduced nearly one quarter, the unpaid stock reverting to the company.]

The amount, received by the company, from its stock subscriptions, to the 1st of May, was.....\$1,256,300

The amount of funded debt..... 599,000

The amount of floating debt..... 394,700

Total receipts.....\$2,250,000

The amount yet to be received from actual subscriptions for bonds, is.....\$310,000

The amount that will be realized in cash from present stock subscriptions..... 40,000

There will be payable to contractors in stock, under contracts now in force.....\$27,000

The company will have a balance of capital stock at its disposal of (at par)..... 476,700—1,053,700

Balance..... 24,300

\$3,328,000

To which balance of.....\$24,300
Add the present floating debt.. 394,700

Making.....\$419,000

Which, when provided for by negotiation of the company's bonds, will leave the road finished, with a debt equal to the amount of stock reverted and belonging to the company.

The credit of the company is unimpaired, notwithstanding the prevalent clamor against railroads, and but for the scarcity of money no difficulty would have been found in obtaining all their wants on the bonds which have been offered. In order to place these bonds in a more favorable light, the road, furniture, and fixtures have been mortgaged to secure their payment. This mortgage covers all bonds which have been or will be issued by the company to the extent of \$1,500,000.

Rapid progress has been made during the last year in completing the various connecting lines of railway extending east and south from Lake Champlain. The Vermont and Canada will be finished the present season, and thus open communication with all New England, as well as those in the valley of the Hudson. The line of road connecting Rouse's Point with St. Johns, has been put under contract, and will be finished to meet the Ogdensburgh in October.

The directors believe that the bridge at Rouse's Point will be constructed at an early date, demanded as it is and will be by the great and varied interests of the trading and travelling community; but they do not consider it essential to the success of the Ogdensburgh road, for reasons which they give in brief.

The directors close their report by expressions of confidence in regard to the complete success of the road, but do not wish unduly to influence the present stockholders to retain their shares, or to purchase more than they now hold. They believe all the anticipations of its projectors will be realized, and that the road will yield a satisfactory income, when in full operation. The expenditures have been prudently and judiciously made, and the road, when finished, will be one of the cheapest and best constructed railways in America.

New York.

At a meeting of the stockholders of the Chemung railroad company, held at Jefferson, Chemung Co. on the 3d inst., an election was held for thirteen directors, when the following named gentlemen were duly elected:

Simeon Benjamin, Wm. Maxwell, John Arnot, Alexander S. Diven, Elmira; Charles Cook, Havana; Wm. W. Watson, Wm. N. Clark, Nathan Ridder, Charles A. Cook, Geneva; Isaac Otis, J. S. T. Straghan, Freeman Rawdon, Josiah W. Baker, New York.

A meeting of the directors was held on the 20th instant, when the following gentlemen were duly elected officers for the ensuing year:

Simeon Benjamin, of Elmira, President. Isaac Otis, of New York, Treasurer. H. H. Casey, do., Secretary.

Railroad from Canandaigua to the Chemung R.

Road.—We learn that this road, which is an extension of the Chemung railroad, is under contract for everything except the cars, at ten thousand dollars per mile, to experienced and faithful contractors. A considerable amount of stock has been subscribed, which, with the amount to be taken by the contractors, will be sufficient to get the road ready for the iron. It is believed that eight hundred thousand dollars will be ample to build and equip it completely. A saving of several hours will be made by running this road from Cananda-

igua to Jefferson over the Geneva Lake route, which will attract travel over the Chemung road. It is contemplated to extend the Canandaigua road to Batavia, and eventually to Lockport and the Niagara river.

Wisconsin.

Milwaukee and Mississippi Railroad.—The city of Milwaukee has loaned its credit to the above road to the amount of \$250,000. This places in the hands of the company ample means to complete the first division of the road, 55 miles, to the Rock River Valley, which is to be done the present season.

Massachusetts.

Boston and Maine Railroad.—The fifteenth annual report of the directors of this road has been issued. It states that, "the usual July dividend has been delayed to the end of the year, by the action of the stockholders, in the protracted inquiry and severe scrutiny, which they caused to be instituted through their committee of investigation. The result of this examination into the condition of the company, proves the unquestionable soundness of the enterprise, and calls for renewed diligence on the part of the directors; and must give to the stockholders and the public the fullest confidence in the prosperity of the road." The following statement shows the business of the past year:

The reserved fund by the last annual report, amounted to.....\$48,272 45
Income for the year ending Nov. 30:
From passengers.....332,214 00
From freight.....168,974 21
From mails, rents, and use of road. 21,147 30

\$570,607 96

The expenditures properly chargeable to the operating of the road, and for depreciation of engines and cars.\$276,199 42

\$294,408 54

From which is to be deducted as extraordinary charges for this year, the items for loss of Salmon Falls bridge, car shop at Lawrence, committee of investigation and interest..... 53,491 19

240,917 35

A dividend has been paid on 35,568 shares, of 5½ per cent.....195,624 00

Leaving as a present reserve.....\$45,293 35

Alabama.

Mobile and Ohio Railroad.—The work on the town end of this road continues to advance finely, and everything connected with the enterprise looks encouraging. A permanent bridge is being built by John King over Three Mile creek. When completed, which will be within a short time, temporary tracks will be laid down to facilitate the transportation of dirt for filling in the road through the swamp and the depot ground. By the close of this month the whole of the embankment, every foot of it being through the swamp and portions of it covered with water several feet deep, will be finished to the Three Mile creek, and a considerable portion of the depot filled in.

We are pleased to learn that the stockholders, as a general thing, pay up very promptly their instalments as they become due, thus enabling the directors to push the work with energy without running in debt.

The growing confidence in the value of this enterprise, and the ability to construct it, is not confined to our own people. Intelligent men in all sections of the Union consider it by far the most important railroad yet commenced in the United

States. The length of it, to be sure, renders it a heavy undertaking. But in view of the large and diversified extent of country to be benefitted by it—the vast agricultural and manufacturing resources to be developed—the immense travel that will pass over it, and, as a consequence, the handsome profits that must certainly accrue to the stockholders—even its great length of line dwindles comparatively into insignificance.—*Alabama Planter.*

Notice to Contractors.

HUDSON RIVER RAILROAD.—Proposals for contracts for grading that part of the Hudson River Railroad not now under contract, will be received by the Directors of the Company, at the office, 54 Wall street, New York, until the 2d day of July, at noon, which will be answered on the Saturday following (July 6th.)

The work consists principally of rock and earth excavations, to be carried into embankments, for the road bed on Sections No. 67 to 74 inclusive, extending from Garretson's Point two miles above Rhinebeck to East Camp, about 13 miles. In regard to examinations for proposals, reference to be made to Wm. Jervis, Resident Engineer, at Tivoli, Dutchess county.

Also sections 75 to 83, inclusive, about fourteen miles. In regard to which, refer to John C. Campbell, Resident Engineer, at Hudson.

Payments will be made in cash on monthly estimates, reserving 15 per cent. until the work is completed.

The part of the work above Oak Hill, which is opposite Catskill, will be required to be finished on or before the 1st March, 1851, and that below on or before the 1st of July following.

Contractors whose bids may be accepted will be required to enter into contract and commence the work without delay.

The names in full of all parties proposing to be interested in contracts must be given in the proposition, as no assignment or transfer of bids will be permitted.

The Directors reserve to themselves the right to accept or reject proposals that may be offered, as they may consider the interest of the company to require.

WILLIAM C. YOUNG,
Chief Engineer.

Dated June 19, 1850.

Patent Self-clinching Railroad Spikes.



These spikes have been in use upon various roads for several years, and have met with universal approval by Engineers. They drive in the manner shown, turning themselves, and are therefore not liable to work loose. They will prove of great value to secure the chair.

We are also manufacturing railroad spikes, hook and flat head; wrought chairs, clamps, etc., of superior quality, and are prepared to contract for any pattern or weight upon favorable terms.

SMITH & TYSON,
25 South Charles st., Baltimore Md.

NORRIS' LOCOMOTIVE WORKS, SCHENECTADY, N. Y.

THESE Works are in full operation in Manufacturing to order, Locomotive Steam Engines & Tenders, of the best principle and construction of material, using wrought iron heavy frames with pedestals welded thereto, and all parts of the engine made of the best wrought iron, except cylinders, pumps and boxes—obtaining greater durability, and carrying less weight over the road, than engines constructed of cast iron.

Wrought Iron Tires made any required size, and Tire Bars bent and welded with dispatch. Chilled Wheels for Cars, Trucks and Tenders, made from the toughest iron.

Driving and Tender and Car Wheels fitted to Axles with Brass Boxes and Springs, and Railroad Machinery generally. Manufactured and for sale by
April 11, 1849. E. S. NORRIS.

Ray's Patent India Rubber Car Springs.

Savannah, Ga., May 22, 1850.

FOWLER M. RAY, Esq.,

Dear Sir: I have no hesitation in saying, after having used on our road your springs and Fuller's, that I consider yours decidedly the best in every particular, and in this opinion I am sustained by all our officers. Fuller's springs has a tendency to split, and also to chafe or abrade by the constant friction on the cast iron plates or discs: and in my opinion is not near so elastic as yours.

Your springs, which have been in use on our road for 12 or 15 months past, and in constant use under both passenger and freight cars, are to all appearances as elastic, sound and good, as when first put in use.

We are now building eighty-five new cars, of which for fifty-sets the springs have been ordered of you.

GEORGE A. ADAMS,
Master Carpenter,
Central Railroad and Banking Co. of Georgia.

Connecticut River Railroad Office,
Northampton, May 4, 1850.

E. CRANE, Esq.,

Dear Sir: It is now about two years since I first tried the experiment of using a set of Ray's India-rubber Springs upon one of our merchandise cars, and although the car has been in constant service since that time, I do not on examination find the slightest difference either in the thickness or elasticity of the material.

The same result has followed wherever we have applied them, either for wheel or draw springs on Engines, Tenders or Cars. At present we use no other: either in replacing old springs or building new cars—and I am perfectly satisfied that for economy, durability, safety, and ease of motion, that Ray's India-rubber is the best article for Springs which has been presented to the public.

Yours respectfully, J. HUNT,
Supt. Connecticut River Railroad.

EDWARD CRANE, Esq.,

Dear Sir: Having applied to cars of the Boston and Worcester Railroad Corporation, Ray's Vulcanised Rubber Springs (where they have been in use for some two years last past), I have had occasion to observe their operation, and am free to say in answer to your inquiries, that they retain their elasticity perfectly during all changes of atmospheric temperature: and are in my opinion a most valuable acquisition to Railroad Cars—are not liable to derangement, as is the case with steel springs; while at the same time it costs less to apply them. Respectfully yours,

D. N. PICKERING,
Supt. Motive Power, Bost. & Wor. Railroad.
Boston, April 15th, 1850.



NORTHERN RAILROAD, NEW YORK.

CARS run between Rouses Point and Chateaugay daily, Sundays excepted, as follows:

Leave Rouses Point at 3 4 A.M.
Leave Chateaugay at 6 4 P.M.

On the arrival of the cars at Chateaugay, stages are in readiness to take the passengers to Ogdensburg, where they arrive the same day.

Passengers leave Ogdensburg in the morning by stage, and take the evening train from Chateaugay to Rouses Point, where they go immediately on board the steamboats which run north and south on Lake Champlain.

Passengers leaving New York in the evening by the way of Whitehall, will arrive at Rouses Point the next night, and the next morning pass directly from the boat to the cars, and arrive at Ogdensburg the same day.

CHARLES L. SCHLATTER, Supt.

Ibbotson, Brothers & Co's CELEBRATED CAST STEEL

AND

Best Cast Steel Royal Improved Files, well known as better adapted for Engineers' and Machinists' purposes than any now in use in the United States.

Every description of Square, Octagon, Flat and Round Cast Steel, Sheet, Shovel and Railway Spring Steel, etc., and Steel to order for any purposes—manufactured at their works in Sheffield—and universally known by the old stamp "Globe."

HENRY J. IBBOTSON, Agent,
218 Pearl st., New York.

NOTICE.

A young man of experience in Surveying wishes a situation on a Railroad as an Assistant. Please apply at this office.

Election of an Engineer.

At a Meeting of the Board of Directors of the Virginia Central Railroad Co. at Charlottesville on the 4th day of June, 1850,

Resolved, That the election of a Chief Engineer in the place of Wm. A. Kuper, whose resignation has been accepted, is postponed to take place in Richmond on Tuesday the 18th of June instant.

A copy from the minutes.

JOHN GARRET, Secretary.

Lovegrove's Patent Cast Iron Water and Gas Pipes.

THE Subscriber, the Inventor and Patentee of the Centrifugal mode of giving form to metallic substances while in a molten state, is preparing to make Cast Iron Water and Gas Pipes, of any dimensions, at prices much lower than they can be made in the old manner, and the pipes warranted to stand a pressure of three hundred pounds to the square inch, and to be soft enough to drill. Steam Engines and all kinds of machinery. Cast Iron Doors and Frames, and Mill Castings of every description, made to order.

THOMAS LOVEGROVE,
Machinist and Founder,
West Falls Avenue, below Pratt st., Baltimore.

American Railway Guide, AND POCKET COMPANION FOR THE UNITED STATES;

CONTAINING Correct Tables, showing the time for starting of trains from all stations, distances, fares, etc., on all the Railway lines in the U. States; also many of the principal Steamboat and Stage routes—accompanied by a complete RAILWAY MAP. Price, single copies 12 1/2 cts., or \$1 per annum. Published on the first of every month, corrected from returns furnished by the Railway Superintendents throughout the Union.

This book has been compiled somewhat on the plan of Bradshaw's Guide, with such improvements in size, form and arrangement as have seemed desirable; and the publisher confidently hopes it will not be found liable to the objections of incompleteness and incorrectness, which have been made, and justly too, against various other similar works heretofore issued.

The subscriber having had the management of the NEW YORK PATHFINDER almost from its commencement, has enjoyed superior facilities in obtaining information relating to the thoroughfares of travel, and is therefore well qualified to prosecute with success the arduous undertaking of furnishing a complete and correct national guide book.

STRINGER & TOWNSEND, General Agents, 222 Broadway: and sold also by Booksellers and Periodical Dealers generally throughout the country; also on all the Railways and Steamboats.

CURRAN DINSMORE, Publisher.
N. Y. Pathfinder Office,
138 Fulton St., New York City.

India-rubber for Railroad Cos.

RUBBER SPRINGS—Bearing and Buffer—Fuller's Patent—Hose from 1 to 12 inches diameter. Suction Hose, Steam Packing—from 1-16 to 2 in. thick. Rubber and Gutta Percha Bands. These articles are all warranted to give satisfaction, made under Tyer & Helm's patent, issued January, 1849.—No lead used in the composition. Will stand much higher heat than that called "Goodyear's," and is in all respects better than any in use. Proprietors of railroads do not be overcharged by pretenders.

HORACE H. DAY,
Warehouse 23 Courtlandt street.
New York, May 21, 1849.

To Railroad Companies.

FOR SALE—A Second-hand Locomotive Engine and Tender, of about 10 tons weight, in good order, and warranted to perform well. Any company wanting a cheap engine for a passenger or light burden train, will rarely meet with an opportunity so favorable as the present. The engine and tender are in perfect running order, and will be tested to the satisfaction of any one wishing to purchase. Price \$1,500.

Address J. B. MOORHEAD,
Frazer P.O., Chester county, Pa.

P.S.—The Engine can be seen by calling on H. Osmond & Co., Car-builders, Broad st., Philadelphia. September 6, 1849.

Spikes, Spikes, Spikes.

ANY person wishing a simple and effective Spike Machine, or a number of them, may be supplied by addressing
J. W. FLACK,
Troy, N. Y.
March 6, 1850.

Great American Engineering

AND MECHANICAL WORK, just published in medium folio, 75 cts. to Subscribers, One Dollar to non-subscribers.

Part VI of "Specimens of the Stone, Iron and Timber Bridges, Viaducts, Tunnels, &c. &c. of the United States Railroads." By George Duggan, Architect and Civil Engineer.

The present part contains beautifully executed plans, elevations and sections of the Timber Bridge (three spans of 150, and one span of 160 feet) across the Delaware at Saw Mill Rift, on the line of the N. York & Erie R. R., with the specifications, estimates, bills of timber, iron, etc.

N.B.—With the present (6th) part, are given specimen Plates of the APPENDIX, (or "THEORETICAL AND PRACTICAL TREATISE ON BRIDGE BUILDING, etc. etc.") consisting of plans, elevations, sections and details of a cast iron oblique arch, 130 feet span, across Fairfield st. Manchester, on the line of the Manchester and Birmingham Railroad. Also a specimen sheet of the letter press of the APPENDIX, consisting of an introductory article on the *Application of Iron to Railroad Structures*.

"It is a work that was a great desideratum, and must prove of great benefit to the engineering profession generally, and especially to the tyro in practical engineering and mechanical knowledge; in truth it strikes us, that it would require years of labor and patient toil on the part of a young engineer to prepare the drawings, and collect the information that will be embodied in this work, and can now be secured for the trifling sum of \$9"—[Scientific Amer. March 16, 1850.]

In connection with this subject (Iron Railroad Structures) we take occasion to call attention again to Mr. Duggan's valuable and expensive publication, exhibiting drawings, with full descriptions of the various stone, iron and wooden bridges, viaducts, tunnels, culverts, etc., of all the Railroads in the United States. Mr. Duggan is an accomplished Architect and Civil Engineer, who came from Ireland to this country to exercise his profession; but finding Railroad construction here, in many respects, different from that he had been accustomed to in Europe, he applied himself to the study of our system; and the fruits of his researches and investigations embodied in this work, are well calculated to meet the exigencies of engineers, and to assist draughtsmen, bridge builders, mechanics and students.—[N. Y. Journal of Commerce, Feb. 14, 1850.]

Published by **GEORGE DUGGAN**,
300 Broadway, New York.

To whom all communications should be addressed, and subscriptions forwarded.

RAILROAD CAR AND COACH TRIMMINGS.

Doremus & Nixon,
IMPORTERS AND FURNISHERS

HAVE FOR SALE

Plain Garnet Plush. Fig. Garnet Plush (Butterfly pat.
"Crimson" "Crimson" (Elegant.
"Scarlet" " " (Gen. Taylor.

BROCADELLES.

Crimson Silk Brocadelles. Gold and Maroon do.
Gold and Blue " Brown "
Silk and Wool " of every color.

MOQUETTES.

Of elegant designs and colors.

GERMAN CLOTH FOR CAR LININGS.

The most beautiful goods ever shown in this country, and the subscribers are the sole agents for the sale of them.

Oil cloths Enamelled with Gold. These goods can be
" Silver. furnished in any
Do. Silver ground velvet printed. dimensions req'd.

CURLED HAIR

Of every description and quality.

JNO. W. A. STRICKLAND, Agent.
New York, 1850. 1y16

Stickney & Beatty,
DEALERS IN IRON AND IRON MANUFACTURERS.

AGENTS for the Balt. City Rolling Mill, from which establishment they are prepared to furnish Ellicott's round, square, and flat bar iron, puddled and charcoal boiler plates and billet iron—also agents for the sale of the Laurel and Maryland (Balt.) charcoal forge pig irons, Balt. hard iron for churning wheels, anti-friction nails, Castoria foundry iron, boiler blooms from the Caledonian works, Wm. Jessop & Son's cast steel, Coleman's blister steel and nail rods, hoop, band, sheet, oval and common English iron.

Nos. 18 and 20 South Charles st., Baltimore.

Fire Brick.

THE Subscribers have constantly on hand Rafford's Stourbridge, Oak Farms Stourbridge, Lister, Wortley, Red and White Welsh Fire Bricks, common and fancy shapes. Also,

ROOFING SLATES.

from the best Welsh quarries, and of all sizes. Also, **COAL,**

of all kinds—Liverpool Orrell and Cannel, Scotch, New Castle, Pictou, Sidney, Cumberland, Virginia, and all kinds of Anthracite coals. Also,

Pig Iron, Salt, etc., etc., for sale at the lowest market price. Apply to

SAMUEL THOMPSON & NEPHEW,
275 Pearl and 43 Gold Sts., New York.

November, 23, 1849.

FAIRBANKS' RAILROAD SCALES.—THE subscribers are prepared to construct at short notice, *Railroad and Depot Scales*, of any desired length and capacity. Their long experience as manufacturers—their improvements in the construction of the various modifications, having reference to strength, durability, retention of adjustment, accuracy of weight and dispatch in weighing—and the long and severe tests to which their scales have been subjected—combine to ensure for these scales the universal confidence of the public.

No other scales are so extensively used upon railroads, either in the United States or Great Britain;—and the managers refer with confidence to the following in the United States.

Eastern Railroad.	Boston & Maine Railroad.
Providence Railroad.	Providence and Wor. Road.
Western Railroad.	Concord Railroad.
Old Colony Railroad.	Fitchburg Railroad.
Schenectady Railroad.	Syracuse and Utica Road.
Balt. and Ohio Railroad.	Baltimore and Susq. Road.
Phila. & Reading Road.	Schuylkill Valley Road.
Central (Ga.) Railroad.	Macon and Western Road.
	New York and Erie Railroad.

And other principal Railroads in the Western, Middle and Southern States.

E. & T. FAIRBANKS & CO.

St. Johnsbury, Vt.
Agents, } FAIRBANKS & Co., 89 Water St., N. York.
A. B. NORRIS, 196 Market St. Philadelphia. 1y*17
April 22, 1849.

STABILITY—SECURITY—PERPETUITY.
Mutual Life Insurance Co. of New York.

No. 35 WALL STREET.

A MILLION OF DOLLARS

Securely invested in Bonds and Mortgages on real estate in this city and Brooklyn, and stocks of the State and City of New York and United States Government.

The company declared a dividend of profits of fifty-two per cent. on all existing policies on the 31st of January, 1848.

All the Profits are Divided Among the Insured.
Persons may effect insurance on their own lives and the lives of others.

A married woman can insure the life of her husband, the benefits of which are secured by law for the exclusive use of herself or children.

Clergymen and all others dependent upon salaries or their daily earnings are specially invited to avail themselves of a resource whereby their surviving families may be secured from the evils of penury.

Pamphlets explanatory of the principles of Mutual Life Insurance, and illustrating its advantages, with forms of application, may be obtained at the office of the company, 35 Wall street, or of any of its agents.

TRUSTEES.

Jos. B. Collins,	Abraham Bininger,
Wm. J. Hyslop.	Alfred Edwards,
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John P. Yelverton,	Henry Wells,
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Jas. S. Wadsworth,	Moses H. Grinnell,
Charles Ely,	Wm. J. Banker,
John C. Cruger,	John M. Stuart,
Charles King,	Francis S. Lathrop,
Alfred Pell,	Nathaniel Hayden.

JOSEPH B. COLLINS, President.

ISAAC ABBATT, Secretary. 3m9

NOTICE TO**Superintendents of Railroads.**

TYLER'S PATENT SAFETY SWITCH.—The undersigned would respectfully call their attention to his Patent Safety Switch, which from long trial and late severe tests has proved itself perfectly reliable for the purpose for which it was intended. It is designed to prevent the train from running off when the switch is set to the wrong track by design or accident. The single rail or gate switch is established as the best and safest switch for the ordinary purpose of shifting cars from one track to another, but it is liable to the serious evil of having one track open or broken when connected with the other. My improvement entirely removes this evil, and while it accomplishes this important office, leaves the switch in its original simplicity and perfection of a plain unbroken rail, connecting one track with the other ready for use.

The following decision of the Commissioner of Patents is respectfully submitted to Railroad Engineers, Superintendents, and all others interested in the subject.
P. B. TYLER.

(COPY.)

UNITED STATES PATENT OFFICE,
Washington City, D.C., April 28th, 1846.

SIR: You are hereby informed that in the case of the interference between your claims and those of Gustavus A. Nicolls, for improvements in safety switches—upon which a hearing was appointed to take place on the 3d Monday in March, 1846, the question of priority of invention has been decided in your favor. Inclosed is a copy of the decision. The testimony in the case is now open to the inspection of those concerned.

Yours respectfully,
EDMUND BURKE,
Commissioner of Patents.

To Philos B. Tyler.

Any further information may be obtained by addressing P. B. TYLER, Springfield, Mass., or JOHN PENDLETON, Agent, 149 Hudson St., New York.

Coal.

CUMBERLAND SEMI-BITUMINOUS COAL
superior quality for Locomotives, for sale by
H. B. TEBBETTS,
No. 40 Wall St., New York. 1m19

May 12, 1849.

PHILADELPHIA CAR MANUFACTORY,
CORNER SCHUYLKILL 2D AND HAMILTON STS.,
SPRING GARDEN, PHILADELPHIA CO., PA.
Kimball & Gorton,

Having recently constructed the above works, are prepared to construct at short notice all kinds of

RAILROAD CARS, Viz:

Passenger Cars of all classes—Open and Covered Freight and Express Cars—Coal Cars—Hand Cars & Trucks of all descriptions.

They are also prepared to furnish Chilled Wheels of any pattern. Car Wheels & Axles fitted and furnished. Snow Ploughs and Tenders made to order. Steel and other Springs always on hand.

All orders will be filled at short notice, and upon as good terms as at any other establishment in the country. Omnibuses from the Exchange run within one square of the manufactory every 10 minutes during the day.
Philadelphia, June 16, 1849. 1y25

C. W. Bentley & Co.,

IRON Founders, Portable Steam Engine Builders and Boiler Makers, Corner Front and Plowman Sts., near Baltimore St. Bridge,

BALTIMORE, MARYLAND.

Their Engines are simple in their construction, compact and durable; they require no brick work in setting them, and occupy but a small space (a six horse power engine and boiler, standing on a cast iron plate of three by six feet.)

They also manufacture Major W. P. Williamson's new oscillating Engine; a superior article, combining cheapness and simplicity (one of which may be seen in operation at their shop.) Both of these engines are adapted to any purpose, where power is required, and may be made of any capacity; and for economy in use of fuel are unsurpassed.

All kinds of machinery made to order. Steam Generators, Force Pumps, Wrought Iron Pipes and Fittings for Steam, Water, Gas, etc., constantly on hand,
Baltimore, June 6, 1849.

CORROSIVE SUBLIMATE.

THIS article now extensively used for the preservation of timber, is manufactured and for sale by **POWERS & WEIGHTMAN**, manufacturing Chemists, Philadelphia.
Jan. 20, 1849.

ENGINEERS.**Atkinson, T. C.,**

Alexandria and Orange Railroad, Alexandria, Va.

Bancks, C. W.,

Civil Engineer, Vicksburg, Miss.

Berrien, John M.,

Michigan Central Railroad, Marshall, Mich.

Buckland, George,

Troy and Greenbush Railroad.

Clement, Wm. H.,

Little Miami Railroad, Cincinnati, Ohio.

Cozzens, W. H.,

Engineer and Surveyor, St. Louis, Mo.

Alfred W. Craven,

Chief Engineer Croton Aqueduct, New York.

Davidson, M. O.,

Eckhart Mines, Alleghany Co., Maryland.

Fisk, Charles B.,

Cumberland and Ohio Canal, Washington, D. C.

Felton, S. M.,

Fitchburgh Railroad, Boston, Mass.

Floyd-Jones, Charles,

South Oyster Bay, L. I.

Gzowski, Mr.,

St. Lawrence & Atlantic Railroad, Montreal, Canada.

Gilbert, Wm. B.,

Rutland and Burlington Railroad, Rutland, Vt.

Grant, James H.,

Nashville and Chattanooga R. R., Nashville, Tenn.

S. W. Hill,

Mining Engineer and Surveyor, Eagle River, Lake Superior.

Holcomb, F. P.

Southwestern Railroad, Macon, Ga.

Johnson, Edwin F.

New York and Boston Railroad, Middletown, Ct.

Latrobe, B. H.,

Baltimore and Ohio Railroad, Baltimore, Md.

Miller, J. F.,

Worcester and Nashua Railroad, Worcester, Mass.

Morris, Elwood,

Schuylkill Navigation, Schuylkill Haven, Pa.

Morton, A. C.,

Atlantic and St. Lawrence Railroad, Portland, Me.

McRae, John,

South Carolina Railroad, Charleston, S. C.

Nott, Samuel,

Lawrence and Manchester Railroad, Boston.

Prichard, M. B.,

East Tennessee and Georgia R. R., Cleveland, Tenn.

Roebling, John A.,

Trenton, N. J.

W. Milnor Roberts,

Bellefontaine and Indiana Railroad, Marion, Ohio.

Roberts, Solomon W.,

Ohio and Pennsylvania Railroad, Pittsburgh, Pa.

Sanford, C. O.,

South Side Railroad, Virginia.

Schlatter, Charles L.,

Northern Railroad (Ogdensburg), Malone, N. Y.

Sours, Peter,

Rahway, New Jersey.

Stark, George.,

Bost., Con. and Mont. R. R., Meredith Bridge, N. H.

Steele, J. Dutton,

Pottstown, Pa.

Trimble, Isaac R.,

Philad., Wil. & Baltimore Railroad, Wilmington, Del.

Tinkham, A. W.,

United States Fort, Bucksport, Me.

Thomson, J. Edgar.,

Pennsylvania (Central) Railroad, Philadelphia.

Troost, Lewis,

Alabama and Tennessee Railroad, Selma, Ala.

Whipple, S.,

Civil Engineer and Bridge Builder, Utica, N. Y.

Williams, E. P.,

Auburn and Schenectady Railroad, Auburn, N. Y.

Williams, Charles H.,

Milwaukee, Wisconsin.

HOTELS.**GUY'S****United States Hotel,**

(Opposite Pratt street Railroad Depot.)

BALTIMORE.**JOHN GUY.****WILLIAM GUY.****American Hotel,**

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BALTIMORE.**HENRY M. SMITH.....Proprietor.**

Late of the Exchange & St. Charles Hotels, Pittsburg.

Washington Hotel,**BY JOHN GILMAN,**

\$1 Per Day.

No. 206 Pratt street, (near the Depot.)

BALTIMORE.**Fountain Hotel,****LIGHT STREET, BALTIMORE,****P. THURSTON.....Proprietor.****Barnum's City Hotel,****MONUMENT SQUARE, BALTIMORE.**

This Extensive Establishment, erected expressly for a Hotel, with every regard to comfort and convenience, is situated in the centre and most fashionable part of the city, and but a few minutes' walk from the Railroad Depots and Steamboat Landings.

The House has lately undergone a thorough repair, embracing many valuable improvements, and will accommodate 250 Guests. **BARNUM & CO.****JONES' HOTEL,**

NO. 152 CHESTNUT STREET,

PHILADELPHIA.**BRIDGES & WEST, Proprietors.****DUNLAP'S HOTEL,**

On the European Plan,

NO. 135 FULTON STREET,

Between Broadway and Nassau St.,

NEW YORK.**BUSINESS CARDS.****J. T. Hodge**

Will attend to the examination of mining tracts near Lake Superior, and prepare Reports and Maps.

Address, during the Summer,

Ontanagon Postoffice, Lake Superior.

Cumberland Steam Coal,

FROM THE

FROSTBURG MINES, MD.**H. A. TUCKER,**

Agent of Frostburg Coal Co.

No. 50 Wall Street, New York.

Eaton, Gilbert & Co.,Railroad Car, Coach and Omnibus Builders,
TROY, N. Y.**Nathan Caswell,****METAL BROKER, 69 WALL ST., N. Y.**

For the Purchase and Sale of Railroad Iron (new and old,) Boiler Plates, Pig and Bar Iron, Lead, Tin, Copper, Spelter, etc. Refers to

Messrs. Boorman, Johnston & Co., New York.

" Grinnell, Minturn & Co., "

" Barston, Pope & Co., "

" Earps & Brink, Philadelphia.

" E. Pratt & Brother, Baltimore.

John Barstow, Esq., Providence.

Lewis Bullard, Esq., Boston.

February 9, 1850.

6m*

United States Railroad Guide and Steamboat Journal.

CONTAINING OFFICIAL TIME ADVERTISEMENTS, Tables of Stations, Distances, Fares, Time, etc., with much miscellaneous matter for the travelling public. Price 12 cents a copy. Yearly subscription \$1. Published at 43 Ann street, New York.

J. & Riley Carr,

Manufacturers of Cast, Shear, German and Blister

STEEL,Of all Descriptions, Warranted Good.
BAILEY-LANE WORKS, SHEFFIELD.**R. S. STENTON, Agent,****NO. 20 CLIFF ST., NEW YORK.****STEEL AND FILES.****R. S. Stenton,**

20 CLIFF STREET, NEW YORK,

AGENT FOR

J. & Riley Carr's**BAILEY-LANE WORKS, SHEFFIELD,**

Manufacturers of Cast, Shear, German and Blister

STEEL

Of all descriptions. Warranted Good

FILES.

Manufacturers of Machinists' Warranted Best Cast Steel Files, expressly for working upon Iron and Steel, made very heavy for recutting.

A full Stock of Steel and Files at all times on hand. 6m4

Walter R. Johnson,**CIVIL AND MINING ENGINEER AND AT-**
torney for Patents. Office and Laboratory, F St., opposite the Patent office, Washington, D. C.**Dudley B. Fuller & Co.,****IRON COMMISSION MERCHANTS,**

No. 139 GREENWICH STREET,

NEW YORK.**Manning & Lee,****GENERAL COMMISSION MERCHANTS,**

NO. 51 EXCHANGE PLACE,

BALTIMORE.Agents for Avalon Railroad Iron and Nail Works.
Maryland Mining Company's Cumberland Coal 'CED'
—'Potomac' and other good brands of Pig Iron.**Cop Waste.****CLEAN COP WASTE,** suitable for cleaning Rail-
road, Steamboat and Stationary Engines, con-
stantly on hand and for sale by**KENNEDY & GELSTON,**

54 Pine St., New York.

October 27, 1849,

3m

Ranstead, Dearborn & Co.,**MANUFACTURERS OF**
LOCOMOTIVE CRANKS AND CAR AXLES,

ALSO

WROUGHT IRON SHAFTING,

And All Kinds of Hammered Shapes.

Forge at Commercial Point, Dorchester,

Office 25 Foster's Wharf, opposite No. 211 Broad St.

BOSTON.**Henry J. Ibbotson,****IMPORTER of Sheffield and Birmingham Goods.**
Also, Agent for the Manufacture of Telegraph
Wire. 218 PEARL ST., NEW YORK.**Cumberland, (Md.) Coals for**
Steaming, etc.**ORDERS RECEIVED FOR AND FILLED**
by **J. COWLES, 27 Wall St., N. Y.**

**Railroad Car Manufacturer's
Furnishing Store.****F. S. & S. A. MARTINE,**

IMPORTERS AND MANUFACTURERS OF

**RAILROAD CAR &
CARRIAGE LININGS,**

PLUSHES, CURTAIN MATERIALS, ETC.,

113 WILLIAM ST., NEAR JOHN.

3-4 and 6-4 Damasks, Union and Worsted; Mo-
reens, Rattinets, Cloths, Silk and Cotton Velvets,
English Bunting**To Engineers and Surveyors.**E. BROWN AND SON Mathematical inst. mak-
ers No. 27 Fulton Slip, New York, make and keep
for sale, Theodolites, Levelling inst., Levelling rods,
Surveyors Compasses, and Chains, Cases of Mathe-
matical drawing insts. various qualities, together with
a general assortment of Ivory Scales and small insts.
generally used by Engineers.**Samuel Kimber & Co.,
COMMISSION MERCHANTS**

WILLOW ST. WHARVES, PHILADELPHIA.

AGENTS for the sale of Charcoal and Anthracite

Pig Iron, Hammered Railroad Car and Locomotive

Axles, Force Pumps of the most approved con-
struction for Railroad Water Stations and Hydraulic

Rams, etc., etc.

July, 27, 1849.

James Herron, Civil Engineer,

OF THE UNITED STATES NAVY YARD,

PENSACOLA, FLORIDA.,

PATENTEE OF THE

HERRON RAILWAY TRACK.Models of this Track, on the most improved plans,
may be seen at the Engineer's office of the New York
and Erie Railroad.**To Railroad Companies.**

—WROUGHT IRON WHEELS—

SAFETY AND ECONOMY.

NORRIS' LOCOMOTIVE WORKS,

SCHENECTADY, NEW YORK,

Are Manufacturing Wrought Iron Driving, Truck,

Tender, and Car Wheels—made from the best Ameri-

can Iron. Address E. S. NORRIS.

May 16, 1849.

Machinery Warehouse.S. C. HILLS, No. 43 Fulton street, New York, has
constantly for sale Steam Engines, Boilers, Lathes,
Chucks, Drills, Planers, Force and Suction Pumps;
Tenoning, Morticing and Boring Machines, Shingle
Machines, Bolt and Nut Machines, Belting, Oil, Iron
and Lead Pipe; Rubber, Percha and Leather Hose,
&c., &c.S. C. H.'s arrangements with several machine shops
are such that he can supply, at very short notice, large
quantities of machinery.

November 23, 1849.

**George O. Robertson,
BROKER IN SCOTCH AND
AMERICAN PIG IRON;**

Bar Iron, Lead, Spelter, Tin, Copper, etc.,

No. 4 Liberty Place, MAIDEN LANE,

(Near Broadway.)

NEW YORK

**Manufacture of Patent Wire
ROPE AND CABLES,**

For Inclined Planes, Suspension Bridges, Standing

Rigging, Mines, Cranes, Derrick, Tillers, &c., by

JOHN A. ROEBLING, Civil Engineer,

TRENTON, N. J.

**Samuel D. Willmott,
MERCHANT, AND MANUFACTURER OF
CAST STEEL WARRANTED SAWS,**

—AND FILES—

IMPORTER OF THE

GENUINE WICKESLY GRINDSTONES

NO. 8 LIBERTY STREET,

NEW YORK.

**Doremus & Harris,
ANALYTICAL & CONSULTING CHEMISTS,**

179 BROADWAY, NEW YORK.

SCHOOL OF CHEMISTRY.

IRON.**Railroad Iron.****3,000 TONS C. L. MAKE 63½ lbs. per yard,**
now landing and to arrive.Also contracts made for future delivery of above su-
perior make English Iron.

300 Tons Banks Best Iron, Round, Square and Flat.

200 " English Bar " " " " "

10 " 9-16 Square Iron for Railroad Spikes.

For sale in lots to suit purchasers by

DAVID W. WETMORE.

New York, March 26, 1850. 3m

**SPRING STEEL FOR LOCOMOTIVES, TEN-
DERS AND CARS.**The subscriber is engaged
in manufacturing spring steel from 1½ to 6 inches in
width, and of any thickness required: large quantities
are yearly furnished for railroad purposes, and where-
ever used its quality has been approved of. The estab-
lishment being large, can execute orders with great
promptitude, at reasonable prices, and the quality war-
ranted. Address J. F. WINSLOW, Agent,

Albany Iron and Nail Works.

Railroad Iron.THE Undersigned, Agents for Manufacturers, are
prepared to contract to deliver Rails of superior
quality, and of any size or pattern, to any ports of dis-
charge in the United States.

COLLINS, VOSE & CO.,

74 South St.

New York, June 1, 1850.

Railroad Iron.

1,500 Tons weighing 53 lbs. per lineal yard.

500 " " 57 " "

500 " " 56 " "

500 " " 60 & 61 lbs. "

Also 2½x½ flat rails. All the above being of approv-
ed patterns. For sale by

DAVIS, BROOKS, & CO.,

68 Broad street.

N.B.—Rails imported on commission, or at a fixed
price.**Iron.**Pig Iron, Anthracite and Charcoal; Boiler and Flue
Iron, Spring and Blistered Steel, Nail Rods, Best Re-
fined Bar Iron, Railroad Iron, Car Axles, Nails, Stove
Castings, Cast Iron Pipes of all sizes, Railway Chairs
of approved patterns for sale by

COLEMAN, KELTON & CABBELL,

109 N. Water St., Philadelphia.

IRONDALE PIG METAL, MANUFACTURED

and for sale by the Bloomsburg Railroad Iron Co.

LINDLEY FISHER, Treasurer.

75 N. Water St., Philadelphia.

Railroad Iron.**2,000 Tons, weighing 53 pounds per lineal yard,**
of the most approved pattern of T rails, in
store and to arrive, for sale by

COLLINS, VOSE & CO.,

74 South St.

New York, June 1, 1850.

Railroad Iron.**1,675 Tons, weighing about 61 lbs. per yard, 90**
tons, weighing about 52 lbs. per yard, and
825 tons, weighing about 53½ lbs. per yard, of the lat-
est and most approved patterns of T rail, for sale by

BOORMAN, JOHNSTON & CO.,

119 Greenwich street.

New York, Feb. 25, 1850.

N.B.—B. J. & Co are also prepared to take con-
tracts for English rails, delivered in any of the Atlan-
tic ports of the United States.**Railroad Iron.**THE UNDERSIGNED, HAVING made arrange-
ments abroad, are prepared to contract for the de-
livery of Foreign rails, of approved brands upon the
most favorable terms.They will also make contracts for American rails,
made at their Trenton works, from Andover Iron, in
whole or in part, as may be agreed upon.They are prepared to furnish Telegraph, Spring and
Market Wire; Braziers and Wire Rods; Rivets and
Merchant Bars to order, all made exclusively from An-
dover Iron. The attention of parties who require iron
of the very best quality for special purposes, is respect-
fully invited.

COOPER & HEWITT,

17 Burling Slip, New York.

February 15, 1850.

Glendon Refined Iron.Round Iron, Band Iron, Hoop Iron,
Square " Flat " Scroll "Axles, Locomotive Tyres,
Manufactured at the Glendon Mills, East Boston, for
sale by

GEORGE GARDNER & CO.,

5 Liberty Square, Boston, Mass.

Sept. 15, 1849. 3m37

**PATENT HAMMERED RAILROAD, SHIP &
BOAT SPIKES.**The Albany Iron Works
have always on hand, of their own manufacture, a
large assortment of Railroad, Ship and Boat Spikes
from 2 to 12 inches in length, and of any form of head
From the excellence of the material always used in
their manufacture, and their very general use for rail-
roads and other purposes in this country, the manu-
facturers have no hesitation in warranting them fully
equal to the best spikes in market, both as to quality
and appearance. All orders addressed to the subscrib-
ers at the works will be promptly executed.

JOHN F. WINSLOW, Agent.

Albany Iron and Nail Works, Troy, N. Y.
The above Spikes may be had at first prices, at
Erastus Corning & Co Albany; Merrill & Co., New
York; E. Pratt & Br 1st, Es. 2nd, Md**LAP—WELDED
WROUGHT IRON TUBES**

FOR

TUBULAR BOILERS,FROM ONE AND A QUARTER TO SEVEN
INCHES IN DIAMETER.THE ONLY Tubes of the same quality and man-
ufacture as those so extensively used in England,
Scotland, France and Germany, for Locomotive, Ma-
rine and other Steam Engine Boilers.

THOMAS PROSSER & SON, Patentees,

28 Platt street, New York.

Railroad Iron.THE UNDERSIGNED ARE PREPARED TO
contract for the delivery of English Railroad Iron
of favorite brands, during the Spring. They also re-
ceive orders for the importation of Pig, Bar, Sheet, etc.
Iron.

THOMAS B. SANDS & CO.,

22 South William street,

February 3, 1849. New York.

Iron Store.THE Subscribers, having the selling agency of the
following named Rolling Mills, viz: Norristown,
Rough and Ready, Kensington, Tridaphia, Potts-
grove and Thorndale, can supply Railroad Companies,
Merchants and others, at the wholesale mill prices for
bars of all sizes, sheets cut to order as large as 58 in.
diameter; Railroad Iron, domestic and foreign; Loco-
motive tire welded to given size; Chairs and Spikes;
Iron for shafting, locomotive and general machinery
purposes; Cast, Shear, Blister and Spring Steel; Bol-
ter rivets; Copper; Pig Iron, etc., etc.

MORRIS, JONES & CO.,

Iron Merchants,

Schuylkill 7th and Market Sts., Philadelphia.

August 16, 1849. 1y33

Railroad Iron.THE MOUNT SAVAGE IRON WORKS, AL-
legany county, Maryland, having recently pass-
ed into the hands of new proprietors, are now prepar-
ed, with increased facilities, to execute orders for any
of the various patterns of Railroad Iron. Commu-
nications addressed to either of the subscribers will have
prompt attention. J. F. WINSLOW, President

Troy, N. Y.

ERASTUS CORNING, Albany

WARREN DELANO, Jr., N. Y.

JOHN M. FORBES, Boston.

ENOCH PRATT, Baltimore, Md.

November 6, 1848.

Railroad Iron.THE SUBSCRIBERS ARE PREPARED TO
take orders for Railroad Iron to be made at their
Phoenix Iron Works, situated on the Schuylkill Riv-
er, near this city, and at their Safe Harbor Iron Works,
situated in Lancaster County, on the Susquehanna
river; which two establishments are now turning out
upwards of 1800 tons of finished rails per month.Companies desirous of contracting will be promptly
supplied with rails of any required pattern, and of the
very best quality.

KEEVES, BUCK & CO.

45 North Water St. Philadelphia.

March 15, 1849.

Monument Foundry.

A. & W. DENMEAD & SON,
Corner of North and Monument Sts.,—Baltimore,
HAVING THEIR

IRON FOUNDRY AND MACHINE SHOP

In complete operation, are prepared to execute faithfully and promptly, orders for Locomotive or Stationary Steam Engines, Woollen, Cotton, Flour, Rice, Sugar Grist, or Saw Mills, Slide, Hand or Chuck Lathes, Machinery for cutting all kinds of Gearing, Hydraulic, Tobacco and other Presses, Car and Locomotive patent Ring Wheels, warranted, Bridge and Mill Castings of every description, Gas and Water Pipes of all sizes, warranted, Railroad Wheels with best faggoted axle, furnished and fitted up for use, complete. Being provided with Heavy Lathes for Boring and Turning Screws, Cylinders, etc., we can furnish them of any pitch, length or pattern. Old Machinery Renewed or Repaired—And Estimates for Work in any part of the United States furnished at short notice.
June 8, 1849.

Iron Wire.

REFINED IRON WIRE OF ALL KINDS,
Card, Reed, Cotton-flyer, Annealed, Broom, Buckle, and Spring Wire. Also all kinds of Round, Flat or Oval Wire, best adapted to various machine purposes, annealed and tempered, straightened and cut any length, manufactured and sold by
ICHABOD WASHBURN.
Worcester, Mass., May 25, 1849.

American and Foreign Iron.

FOR SALE,
300 Tons A 1, Iron Dale Foundry Iron.
100 " 1, " " "
100 " 2, " " "
100 " " Forge "
400 " Wilkesbarre " "
100 " "Roaring Run" Foundry Iron.
300 " Fort " "
50 " Catoctin " "
250 " Chikiswalungo " "
50 " "Columbia" "chilling" iron, a very superior article for car wheels.
75 " "Columbia" refined boiler blooms.
30 " 1 x 1 Slit iron.
50 " Best Penna. boiler iron.
50 " "Puddled" "
50 " Bagnall & Sons refined bar iron.
50 " Common bar iron.
Locomotive and other boiler iron furnished to order.
GOODHUE & CO.,
New York. 64 South street

American Pig, Bloom and Boiler Iron.

HENRY THOMPSON & SON,
No 57 South Gay St., Baltimore, Md.,
Offer for sale. Hot Blast Charcoal Pig Iron made at the Catoctin (Maryland), and Taylor (Virginia), Furnaces; Cold Blast Charcoal Pig Iron from the Cloverdale and Catawba, Va., Furnaces, suitable for Wheels or Machinery requiring extra strength; also Boiler and Flue Iron from the mills of Edge & Hilles in Delaware, and best quality Boiler Blooms made from Cold Blast Pig Iron at the Sherandoah Works, Va. The productions of the above establishments can always be had at the lowest market price, for approved paper. American Pig Iron of other brands, and Rolled and Hammered Bar Iron furnished at lowest prices. Agents for Watson's Perth Amboy Fire Bricks, and Rich & Cos. New York Salamander Iron Chests.
Baltimore, June 14, 1849. 6 mos

Wheel, Forge and Foundry Iron.

LOCUST GROVE Wheel Iron of great strength and superior chilling property. Balt. Charcoal Forge Iron, from Patuxent, Curtis Creek and Gunpowder furnaces. Elkridge Foundry Iron, of superior strength and softness. Anthracite and Charcoal Iron from Pennsylvania and Virginia. Gas and Water Pipes, Lamp Posts from Elkridge furnace.
LEMMON & GLENN,
63 Buchanan's Wharf, Baltimore.

Iron.

THE SUBSCRIBERS having resumed the agency of the New-Jersey Iron Company, are prepared to execute orders for the different kinds and sizes of Iron usually made at the works of the company, and offer for sale on advantageous terms.—

150 tons No. 1 Boonton Foundry Pig Iron.
100 " No. 2 do. do. do.
300 " Nos. 2 & 3 Forge do. do.
100 " No. 2 Glendon do. do.
140 " Nos. 2 & 3 Lehigh Crane do. do.
100 " No. 1 Pompton Charcoal do. do.
100 " New-Jersey Blooms
50 " New-Jersey Faggoting Iron, for shafts
Best Bars, $\frac{1}{2}$ to 4 inch by $\frac{1}{2}$ to 1 inch thick.
Do do Rounds and Squares, $\frac{1}{2}$ to 3 inch.
Rounds and Squares, 3-16 to 1 inch.
Half Rounds, $\frac{1}{2}$ to 1 in. Ovals & Half Ovals $\frac{1}{2}$ to 1 in.
Bands, $\frac{1}{2}$ to 4 inch. Hoops, $\frac{1}{2}$ to 2 inch.
Trunk Hoops, $\frac{1}{2}$ to 1 in. Horse Shoe & Nut Iron.
Nail Plates. Railroad Spikes.
DUDLEY B. FULLER & Co., 139 Greenwich-st. and 85 Broad-st.

WILLIAM JESSOP & SONS' CELEBRATED CAST-STEEL.

The subscribers have on hand, and are constantly receiving from their manufactory,
PARK WORKS, SHEFFIELD,
Double Refined Cast Steel—square, flat and octagon. Best warranted Cast Steel—square, flat and octagon. Best double and single Shear Steel—warranted. Machinery Steel—round.
Best and 2d gy. Sheet Steel—for saws and other purposes.
German Steel—flat and square, "W. I. & S." "Eagle" and "Goat" stamps.
Genuine "Sykes" L Blister Steel.
Best English Blister Steel, etc., etc., etc.
All of which are offered for sale on the most favorable terms by
WM. JESSOP & SONS,
91 John street, New York.
Also by their Agents—
Curtis & Hand, 47 Commerce street, Philadelphia.
Alex'r Fullerton & Co., 119 Milk street, Boston.
Stickney & Beatty, South Charles street, Baltimore.
May 6, 1848.

JOHNSON, CAMMELL & Co's Celebrated Cast Steel,

AND
ENGINEERING AND MACHINE FILES,
which for quality and adaptation to mechanical uses, have been proved superior to any in the United States. Every description of square, octagon, flat and round cast steel, sheet, shovel and railway spring steel, best double and single shear steel, German steel, flat and square, goat stamps, etc. Saw and file steel, and steel to order for any purposes, manufactured at their Cyclops Steel Works Sheffield.
JOHNSON, CAMMELL & CO.,
100 William St., New York.
November 23 1849.

Railroad Iron.

OF ANY PATTERN AND WEIGHT,
Of a Favorite Brand,
And deliverable in Bond, or Duty paid, at any Port of the U. S., contracted for on favorable terms, by
CHARLES ILLIUS,
20 Beaver St., New York.

Pig and other Iron also contracted for. Sole Agent for "Baxter's Machine and Burning Oil"—particularly adapted for "Railroads" and other Machinery—Preferred to Sperrn by the many now using it, and 25 per cent. cheaper.

CUT NAILS OF BEST QUALITY, BAR IRON
(including Flat Rails) manufactured and for sale by
FISHER, MORGAN & CO.,
75 N. Water St., Philadelphia.

Ogden & Martin's ROSENDALE CEMENT.

WE are prepared to enter into arrangements for supplying our Cement for public works or other purposes. We warrant the cement equal in every respect to any manufactured in this country. It attains a great degree of hardness, sets immediately under water, and is a superior article for masonry coming in contact with water, or requiring great strength.

For sale in tight barrels, well papered, at their office by
OGDEN & MARTIN, 104 Wall st.
February 16, 1850. 1y*

The above cement is used in most of the fortifications building by government.

To Steam Engine Builders.

THE Undersigned offer for sale, at less than half its cost, the following new machinery, calculated for an engine of 62 inches cylinder and 10 feet stroke, viz.

- 2 Wrought Iron Cranks, 60 inches from centre to centre.
- 1 Do. do. Connecting Rod Strap.
- 2 Do. do. Crank Pins.
- 1 Eccentric Strap.
- 1 Diagonal Link with Brasses.
- 1 Cast Iron Lever Beam (forked).

The above machinery was made at the West Point Foundry for the U. S. Steamer Missouri, without regard to expense, is all finished complete for putting together, and has never been used. Drawings of the cranks can be seen on application to

HENRY THOMPSON & SON,
No. 57 South Gay St., Baltimore, Md.
Sept. 12, 1849.

8,000 Tons Railroad Iron.

THE OHIO AND PENNSYLVANIA RAILROAD CO. wish to contract for eight thousand tons of Railroad Iron, for the eastern division of their road, extending westward from Pittsburgh. Three thousand tons to be delivered on the Ohio river at Pittsburgh and Beaver, before the close of canal navigation in the present year, 1850; and the remainder in the spring of next year. The rails are to be of the H pattern, in lengths of 20 feet, and are to weigh 60 lbs. per lineal yard. They are to be subject to the inspection of Solomon W. Roberts, Chief Engineer.—For further particulars address the President of the Company at Pittsburgh.

By order of the Board of Directors.
WM. ROBINSON, Jr., President.

S. S. Keyser & Co., IRON WAREHOUSE,

Corner of South and Pratt Streets,
BALTIMORE, MD.
Selling Agents for the Rough and Ready Bar Iron and Elk Boiler and Flue Iron Rolling Mills, Sarah and Taylor Furnaces, and Wrightsville Hollow Ware Foundry, and Dealers in Bar and Sheet Iron, and Cast, Sheer, German, Blister, Spring and Electroplated Steel, etc., etc.

Smith & Tyson,

GENERAL COMMISSION MERCHANTS,
No. 25 South Charles St., Baltimore, Md.
AGENTS for the Celebrated Columbia Pig Iron, suitable for Car Wheels and Chilled Rolls.
Columbia refined Charcoal Blooms; Refined Charcoal Juniata Billet Iron for Wire; Refined Iron for Bridging, of great strength; Cut Nails, Spikes, and Brads; Railroad Spikes and Wrought Chairs. 22tf

To Railroad Companies and Contractors.

FOR SALE.—Two Locomotive Engines and Tenders, at present in use on the Beaver Meadow Railroad, being too light for their coal trains, but well calculated for either gravel or light passenger trains.

They weigh, in running order, about 8 tons each—having one pair of driving wheels 4 feet diameter, 4 truck wheels 30 inches diameter, with cylinders 10 in. diameter, and 18 inches stroke of piston. Tenders on 4 wheels. Address **JAMES ROWLAND,**

Prest. Beaver Meadow Railroad & Coal Co., Philadelphia.
or, **L. CHAMBERLAIN, Sec'y,**
at Beaver Meadow, Pa.
May 19, 1849. 20tf

Railroad Instruments.

THEODOLITES, TRANSIT COMPASSES,
and Levels, with Fraunhoffer's Munich Glasses, Surveyor's Compasses, Chains, Drawing Instruments, Barometers, etc., all of the best quality and workmanship, for sale at unusually low prices, by
E. & G. W. BLUNT,

No. 179 Water St., cor. Burling Slip.
New York, May 19, 1849.

Rosendale Cement.

THE NEWARK AND ROSENDALE LIME AND CEMENT CO. are now manufacturing at their works in NEWARK, N. J., and Ulster county, N. Y., a very superior article of Hydraulic Cement—also Lime Calcine Plaster, etc. Contractors and dealers will find it to their advantage to call or make application before purchasing elsewhere. All communications addressed to the subscriber, at Newark, N. J., will be punctually attended to.
1y*15

HENRY WILDE, Secretary.

Patent India Rubber Steam Packing.

THIS article, made by the subscriber, who alone is authorised to make it, is warranted to stand as high a degree of heat as any that has been or can be made by any person—and is the article which has made the reputation of India Rubber Steam Packing and the demand therefor. A large assortment of all thick nesses requisite for any description of engines, steam pipes, valves, etc., constantly on hand and for sale by the manufacturer and patentee, who will give every information regarding its properties, mode of use, etc. at the warehouse.

JOHN GREACHEN, JR.,
98 Broadway, opposite Trinity Church.

New York, October, 1849.

Passenger Car Linings.

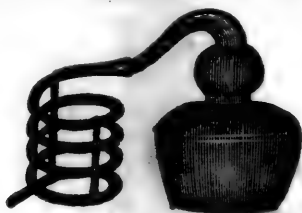
THE Advertiser continues to make to order the Enamelled Car Linings which have been so highly approved the last three years, and are now exclusively used by all the Northern Railroads. No pains are spared to get out new styles, and adapt them to the tastes of every consumer.

Orders addressed to CHARLES STODDER, No. 75 Kilby street, Boston, will have prompt attention.
March 23, 1850. 2m

CAUTION.

RAILROAD COMPANIES and others are here-by cautioned against using or vending our improvement for easing the lateral motion as applied on Railroad Cars. Letters Patent having been granted to us in 1841, any party or parties so making or using said improvement without license from us will be proceeded against according to law.

DAVENPORT & BRIDGES.



P. H. Griffin,

Corner of Steuben and James Sts. Albany, N.Y.
CONTINUES to manufacture copper flues for locomotive boilers, brewers' coppers, stills, tanner heaters, etc. Copper work in general, at the shortest notice. He has constantly on hand brass cocks, brass valves, copper pumps of every variety.
Orders promptly attended to. 1y14

FWLER M. RAY'S Patent India-rubber Railroad CAR SPRING.

New York and Erie Railroad Shops.
Piermont, March 26, 1850.

This will certify that from practical experience in the use of Fowler M. Ray's India rubber Car Springs, I believe them to be far superior to any others now in use.

I have never known them to be affected by any change of temperature, as other Rubber Springs have been affected on this road.

I am at the present time repairing a Passenger Car that Mr. Ray and myself mounted with his springs about two years and eight months since.

The springs are at the present time as perfect, to all appearances, as when first applied to the car.

Respectfully yours,

HORACE B. GARDNER,
Foreman of the Car Shops.

Supt. Office N.Y. & H. R.R.,
New York, March 8, 1850.

This is to certify that we have used the Rubber Springs manufactured by Mr. F. M. Ray for the past twenty months, "both for Passenger and Freight Car Springs and Bumpers, and of different sizes," and have in every case given entire satisfaction, and I consider them the best spring now in use.

M. SLOAT, Supt.

Harlem R.R. Depot,
New York, March 7, 1850.

This is to certify that we have used Mr. F. M. Ray's India-rubber Springs for over eighteen months, and find them to be easy and durable, and recommend them to railroad companies as being superior to anything we have tried.

J. M. SMART,
Foreman at 42d St. Depot.

Office New Jersey Railroad Co.,
Jersey City, March 8, 1850.

FOWLER M. RAY, Esq.,

Dear Sir: In answer to your enquiries respecting the operation of the Vulcanised Rubber Springs, purchased by our company from you some two years since, I reply that they are superior to any spring in use, (that I have either seen or heard of).

The improved form of your spring, consisting of a solid piece of vulcanised rubber with bands on the outside, is far superior to your first form, consisting of disks of rubber with metallic plates interposed.

The last named form was tried, if you recollect, at a much earlier period; and then was replaced by your last form.

I have no hesitation in saying that your springs have given entire satisfaction, and most cheerfully recommend them to railroad companies throughout the country for the following reasons:

1st. The cost is 30 per cent. less.

2d. Saving of weight on each car of 8 wheels from 700 to 900 lbs.

3d. Less care and attention is required, as they are not liable to get out of repair.

4th. A great saving is secured in the wear and tear of the cars and rails from their great elasticity.

5th. The freedom from noise.

6th. There is greater safety in case of accident, as they cannot be broken.

7th. The comfort of passengers is enhanced sufficiently to pay the expense, waiving all the other reasons that I have given.

Should this fail to satisfy any person enquiring, you are at liberty to refer to me, No. 150 Washington St., Jersey City.

Yours respectfully,

T. L. SMITH, Supt.

New York, March 11, 1850.

I have used the Patent India-rubber Spring purchased of Mr. Ray, upon the cars of the New York and New Haven Railroad, and have found them efficient and economical; and when applied to the axles and draw springs, believe them to be quite equal to any in use. I have found a combination of these springs with a steel spring under the transom beam a very satisfactory arrangement, and am now using this plan in all new cars.

Yours respectfully,

ROBERT SCHUYLER.

February 25, 1850.

From practical observation of the use of the India-rubber Car Springs, manufactured and sold by your company, we are entirely satisfied in their application, and do not hesitate to recommend them as elastic, durable, requiring no repairs for years, and retaining their consistency during all extremes of weather. We have applied them for the past two years, and consider them superior for all railroad purposes.

Yours truly,

OSGOOD BRADLEY, Car Builder, Worcester.
T. & C. WASON, do. Springfield.
DEAN, PACKARD & MILLS, do. do.
DAVENPORT & BRIDGES, do. Cambridgeport.

Office of the New Jersey Railroad Co.,
Jersey City, March 7, 1850.

This is to certify that we have had Mr. F. M. Ray's India-rubber Springs in constant use under our cars, and as Bumper Springs for upwards of two years, and they have in every way given perfect satisfaction.

The present form of spring we deem far superior to the form of Disk, having used both forms, although we have none of those made in Disks at present in use.

We take pleasure in recommending these springs to all railroad companies.

J. P. JACKSON, Vice Pres.
New Jersey Railroad and Trans. Co.

Roxbury, February 28, 1850.

In compliance with your request, I take great pleasure in stating the result of my experience in the use of "Ray's Patented Vulcanised India-rubber Car and Engine Springs." We have used them nearly two years, and never had one fail in any way. The cold weather does not affect them, as it has other rubber springs we have used.

With sixteen years' experience as superintendent of machinery on the Boston and Providence railroad, I take pleasure in saying that your springs are the best we ever used, or I ever saw used elsewhere. We have 20 cars rigged with them, of which I can say that the springs are as good now as when first applied. I put 24 lbs. of the rubber under the forward end of one of our heaviest engines, taking off 250 lbs. of steel springs—it has been in use 18 months, and is in as good condition now as when first put under the engine.

Very respectfully yours,

GEO. S. GRIGGS,
Supt. of Machinery, Boston and Prov. R.R.

Fall River, February 2, 1850.

In answer to yours of the 20th ult. I would say that this company has for some 10 or 12 months past been using "Ray's India-rubber Springs." We have applied them to both passenger and freight cars with uniform success. They have invariably preserved their elasticity and consistency through all the extremes of weather; and we are now applying them whenever the steel spring fails. I am well satisfied that they are particularly adapted for railroad purposes.

Very respectfully yours,

GEO. HAVEN,
Supt. Fall River Railroad.

Jersey City, March 9, 1850.

This is to certify that the present form of Mr. F. M. Ray's India-rubber Car Spring I consider far superior to the form of Disk, having used both forms.

I take pleasure in recommending these springs to all railroad companies.
DAVID H. BAKER,
Foreman of Car Shop of N.J. R.R. & Trans. Co.

Boston, March 5, 1850.

In answer to your enquiry about India-rubber Springs, I have to say that we have used them to a considerable extent on both freight and passenger cars, and also on several of our tenders; and I am very well satisfied that they answer all the purposes for which they are intended. I believe the India-rubber will soon supersede all other springs for cars and tenders.

Yours truly,
S. M. FELTON,
Supt. Fitchburg Railroad.

Old Colony Railroad Office,
Boston, March 6, 1850.

EDWARD CRANE, Esq.,

President New England Car Co.,

Dear Sir: In compliance with your request I would state that the Old Colony Railroad Comp'y have had in use upon their road, India-rubber Springs furnished by your company, for more than eighteen months past, during which time they have been extensively used under Passenger and Freight Cars, Locomotive Tenders, and for Drawer and Buffing Springs, with the most perfect success. The elasticity and consistency of the Rubber has never been unfavorably affected by either extremes of heat or cold—and from the experience which we have had in the use of Rubber Springs, I think them well adapted for railroad purposes—and therefore we have for some months past used Rubber almost exclusively, in all places where springs are required.

Respectfully yours, etc.,

JAS. H. MOORE,
Supt. O. C. Road.

Troy, February 27, 1850.

We have been using your India-rubber Car Springs for nearly two years—and we take pleasure in saying that in our opinion the rubber has to a certain extent already, and may eventually entirely supersede all other Springs for Railroad Car purposes. We now use it entirely for Draw Springs and Bumpers, considering it better and lighter than steel.

During our two years' experience in the use of it, we have not known any to lose their elasticity, or fail in any way; and we cheerfully recommend the rubber for railroad car springs. Very respectfully,
EATON, GILBERT & CO.

To Practical Machinists.

AN excellent opportunity now occurs to a practical Machinist, of WELL ESTABLISHED REPUTATION, and some capital, to engage extensively in the STEAM ENGINE, BOILER AND FOUNDRY BUSINESS.

An establishment is now ready for business, ample in all its details, including extensive wharf room, for any sized steamboats, and from its position, if properly conducted, will doubtless command a large share of business.

A practical Machinist, as a partner is required, to conduct the whole establishment; and only those FULLY COMPETENT need apply. Address (post paid) "MACHINE CO.," Box No. 741, Philadelphia, Pa. 1m14

Etna Safety Fuse.

THIS superior article for igniting the charge in wet or dry blasting, made with DUPONT'S best powder, is kept for sale at the office and depot of

REYNOLDS & BROTHER,

Sole Manufacturers,

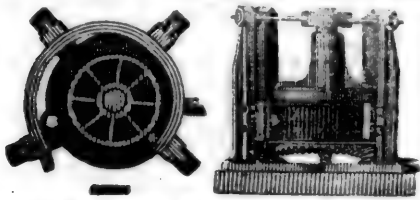
No. 85 Liberty St.

NEW YORK.

And in the principal cities and towns in the U. States. The Premium of the AMERICAN INSTITUTE was awarded to the Etna Safety Fuse at the late Fair held in this city.

November 3, 1849.

1y

MACHINERY.**Henry Burden's Patent Revolving Shingling Machine.**

THE Subscriber having recently purchased the right of this machine for the United States, now offers to make transfers of the right to run said machine, or sell to those who may be desirous to purchase the right for one or more of the States.

This machine is now in successful operation in ten or twelve iron works in and about the vicinity of Pittsburgh, also at Phoenixville and Reading, Pa., Covington Iron Works, Md., Troy Rolling Mills, and Troy Iron and Nail Factory, Troy, N. Y., where it has given universal satisfaction.

Its advantages over the ordinary Forge Hammer are numerous: considerable saving in first cost; saving in power; the entire saving of shingler's, or hammerman's wages, as no attendance whatever is necessary, it being entirely self-acting; saving in time from the quantity of work done, as one machine is capable of working the iron from sixty puddling furnaces; saving of waste, as nothing but the scoria is thrown off, and that most effectually; saving of staffs, as none are used or required. The time required to furnish a bloom being only about six seconds, the scoria has no time to set, consequently is got rid of much easier than when allowed to congeal as under the hammer. The iron being discharged from the machine so hot, rolls better and is much easier on the rollers and machinery. The bars roll sounder, and are much better finished. The subscriber feels confident that persons who will examine for themselves the machinery in operation, will find it possesses more advantages than have been enumerated. For further particulars address the subscriber at Troy, N. Y.

P. A. BURDEN.

Railroad Spikes and Wrought Iron Fastenings.

THE TROY IRON AND NAIL FACTORY, exclusive owner of all Henry Burden's Patented Machinery for making Spikes, have facilities for manufacturing large quantities upon short notice, and of a quality unsurpassed.

Wrought Iron Chairs, Clamps, Keys and Bolts for Railroad fastenings, also made to order. A full assortment of Ship and Boat Spikes always on hand.

All orders addressed to the Agent at the Factory will receive immediate attention.

P. A. BURDEN, Agent,
Troy Iron and Nail Factory, Troy, N. Y.

RAILROAD WHEELS.

CHILLED RAILROAD WHEELS.—THE UNDERSIGNED are now prepared to manufacture their Improved Corrugated Car Wheels, or Wheels with any form of spokes or discs, by a new process which prevents all strain on the metal, such as is produced in all other chilled wheels, by the manner of casting and cooling. By this new method of manufacture, the hubs of all kinds of wheels may be made whole—that is, without dividing them into sections—thus rendering the expense of banding unnecessary; and the wheels subjected to this process will be much stronger than those of the same size and weight, when made in the ordinary way.

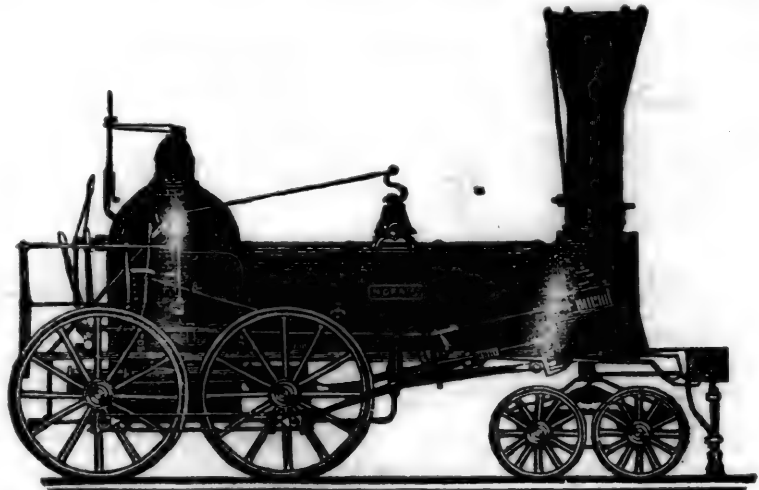
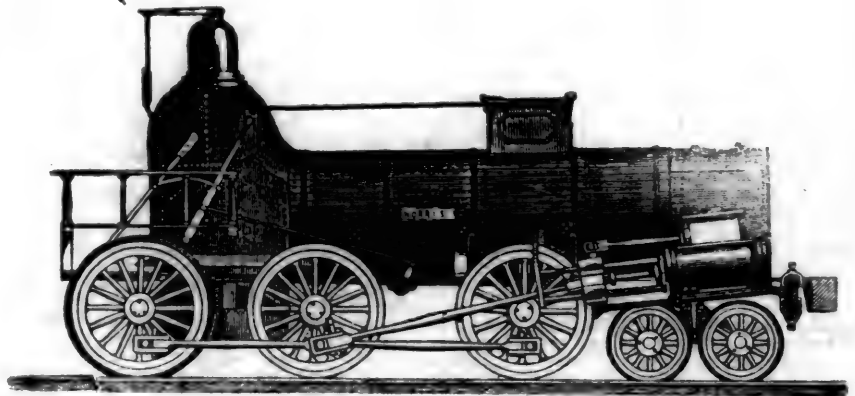
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Willow St., below 13th,
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CHILLED RAILROAD WHEELS.—THE UNDERSIGNED, the Original Inventor of the Plate Wheel with solid hub, is prepared to execute all orders for the same, promptly and faithfully, and solicits a share of the patronage for those kind of wheels which are now so much preferred, and which he originally produced after a large expenditure of time and money.

A. TIERS,
Point Pleasant Foundry.

He also offers to furnish Rolling Mill Castings, and other Mill Gearing, with promptness, having, he believes, the largest stock of such patterns to be found in the country.

A. T.
Kensington, Philadelphia Co.,
March 12, 1842.

NORRIS' LOCOMOTIVE WORKS.
BUSHHILL, SCHUYLKILL SIXTH-ST., PHILADELPHIA,

THE UNDERSIGNED Manufacture to order Locomotive Steam Engines of any plan or size, Their shops being enlarged, and their arrangements considerably extended to facilitate the speedy execution of work in this branch, they can offer to Railway Companies unusual advantages for prompt delivery of Machinery of superior workmanship and finish.

Connected with the Locomotive business, they are also prepared to furnish, at short notice, Chilled Wheels for Cars of superior quality.

Wrought Iron Tyres made of any required size—the exact diameter of the Wheel Centre, being given, the Tyres are made to fit on same without the necessity of turning out inside.

Iron and Brass castings, Axles, etc., fitted up complete with Trucks or otherwise.

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LAURENCE'S ROSENDALE HYDRAULIC Cement. This Cement is warranted equal to any manufactured in this country, and has been pronounced superior to Francis' "Roman." Its value for Aqueducts, Locks, Bridges, Floors, and all Masonry exposed to dampness, is well known, as it sets immediately under water, and increases in solidity for years.

For sale in lots to suit purchasers, in tight papered barrels, by

JOHN W. LAWRENCE,
142 Front-street, New York.

Orders for the above will be received and promptly attended to at this office. 32 ly.

PATENT MACHINE MADE HORSE-SHOES.

The Troy Iron and Nail Factory have all ways on hand a general assortment of Horse Shoes, made from Refined American Iron.

Four sizes being made, it will be well for those ordering to remember that the size of the shoe increases as the numbers—No. 1 being the smallest.

P. A. BURDEN, Agent,
Troy Iron and Nail Factory, Troy, N. Y.

**COLUMBUS, OHIO,
Railroad Car Manufactory.
RIDGWAYS & KIMBALL,**

HAVE established at this central point, the manufacture of Passenger, Freight, Gravel and Hand Cars for Railroads, and assure all Western Railroad Companies that it will be their constant aim to procure the best materials and workmen, and to turn out the best kind of work at fair prices. Specimens may be seen on the Columbus and Xenia Railroad. The patronage of Railroad Companies is respectfully solicited. 1y8

To Inventors and Patentees.

OWEN G WARREN, ARCHITECT, Has had many years' experience as Agent for obtaining Patents, both in this country and Europe, and will transact such business promptly and reasonably. Persons at a distance can have their business done by correspondence—without the necessity of visiting this city or Washington. Office No. 94 Merchants Exchange, Wall st., corner of Hanover st., up stairs. 1y3

AMERICAN RAILROAD JOURNAL.

STEAM NAVIGATION, COMMERCE, MINING, MANUFACTURES.

HENRY V. POOR, Editor.

ESTABLISHED 1831.

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American Railroad Journal.

PUBLISHED BY J. H. SCHULTZ & CO., 136 NASSAU ST.

Saturday, July 6, 1850.

Plan for Shortening the Time of Passage between New York and London.

The interest awakened upon the subject of trans-Atlantic steam navigation, has led to the publication of the following petition, addressed to the Legislature of Maine.

To the Honorable, the Senate and House of Representatives of the State of Maine, in session at Augusta, A. D. 1850:

The undersigned, citizens of Maine, respectfully request, your honorable body to cause to be surveyed and ascertained, the most practicable route for a railway, from the city of Bangor to the eastern boundary of the State, in the general direction of the city of St. John, New Brunswick; and to take such further action in the premises as will tend to favor the construction of a railroad from the city of Bangor to some good harbor on the eastern shore of Nova Scotia, or Cape Breton, best fitted to become the entrepot and terminus for the most direct line of trans-Atlantic navigation.

From the easternmost point of Nova Scotia, Cape Canso, in latitude 45° 17' N. and in longitude 61° 3' W. to Galway Bay, in Ireland, in lati-

tude 53° 13' N. and in longitude 9° 13' W., the distance is about 2000 miles. Assuming a speed of 17 miles an hour in steam vessels, the Atlantic Ocean can be crossed between these points in five days' time.

The nearest good harbor to Cape Canso, Whitehaven, in lat. 45° 10' N. long. 61° 10' W., according to the authority of Admiral Owen, in a report on the subject made to Sir John Harvey, Sept. 5 1846—"is the most splendid and commodious port, at the nearest available point of North America to Ireland; its natural facilities greatly exceeding those of Halifax, or any other point upon the coast." Galway harbor is one of the finest in the world, having great advantages over Bristol or Liverpool as a steam ship terminus.

The Gut of Canso could probably be passed by bridge; but upon this point there is at present no satisfactory information. By means of a ferry across the Gut of Canso, the line could be extended to Louisburgh harbor in Cape Breton, still further east, to a point less than 2000 miles distant from Galway Bay—as will appear by the accompanying map or plan.

From Galway to Dublin, a line of railway is nearly completed across Ireland in actual operation from Dublin to Mullingar, a distance of fifty miles. From Dublin, the distance of sixty-three miles across the Irish Channel to Holyhead, is passed with steam packets, at the rate of 18 miles an hour, to which place the Chester and Holyhead railway is already finished, connecting with Liverpool and London—crossing the Menai Straight by the Britannia Tubular Bridge, which was opened for traffic on the 18th of March, 1850.

The route of the steamship from Liverpool to New York passes near to Cape Race in Newfoundland, Cape Breton, and Cape Canso, and thence along the coast of Nova Scotia to Cape Sable, and parallel with the general line of the coast of New Brunswick and Maine. From Cape Canso to New York the distance can be passed in about the length of time. From New York to Waterville the railway is already finished, a distance of 410 miles. From Waterville to the city of St. John, the distance would be about 200 miles; and from St. John to Whitehaven less than 250 miles further; making the entire distance from New York to Whitehaven from 800 to 900 miles in all.

From Whitehaven to the head of the Bay of Fundy, at Sackville, a feasible route for a railway has been ascertained, passing near to Pictou, thro' the valuable coal districts along the shore of the Gulf of St. Lawrence; and it is believed that the Legislature of Nova Scotia would cheerfully engage to construct that part of the line whenever the other portions are secured.

A line of railway from Halifax, passing in the vicinity of Truro, could be easily connected at some feasible point with the main trunk; and it cannot be doubted that the enterprising citizens of Halifax

would engage in its construction at once. At the present time they are urging the completion of a line from Halifax to Windsor, and a survey of the route has been accomplished.

From the city of St. John to Shediac Bay, on the Gulf of St. Lawrence, a line has been surveyed for a railway on the general line of the route to Sackville, and Provincial aid to a large amount proposed. The Province of New Brunswick has recently appropriated £60,000 currency—\$240,000, to construct that portion of the distance between Shediac Bay and the Bend of the Petecodiac river—the head of navigation on the Bay of Fundy. No doubt can be entertained that the Province would extend this line from a point of connection with the Nova Scotia line to the city of St. John; and it is believed that the local business of the country between the city of St. John and Whitehaven or Canso, would at the present time pay a tolerable remuneration to the stockholders.

From the city of St. John to Bangor it is supposed that a route tolerably direct can be found, without encountering serious obstacles. The necessary information upon this point has never been ascertained; and it is for the purpose of asking that this service may be speedily accomplished, that we approach your honorable body. From Bangor to Waterville, private enterprise has already demonstrated the fact, that either one of several cheap and practicable routes can be adopted.

The only grant asked of the Legislature, or that will be necessary to obtain, is an appropriation sufficient to secure the completion of the remaining link in the line of surveys, and at a suitable time, the necessary grant of a charter to carry this work forward, which, from the progress of events, must soon claim the public attention.

The citizens of Maine are generally aware of the importance of the question to the best interests of the State; but the work is too great for individuals to undertake with our present means. The proper surveys once being completed, would place before the country the great advantage of the position of our State for a leading part in the commercial movements of the age. Private enterprise ought not to be so largely taxed as it must necessarily be, without the grant of aid to the proposed survey in whole or in part by the State, for the purpose of procuring valuable information, equally desired by, or at any rate of equal importance to, all. Maine ought not, either, to remain indifferent to the great advantages which may now be brought within her reach by a proper attention to the great movements in ocean steam navigation and commercial affairs.

The most strenuous efforts are now made to revive the plan of the Quebec and Halifax line;—and various projects are now engaging the attention of the British Provinces, with a view to secure in some form or other the aid of the home government. The movement is gaining favor in Great Britain.

From Halifax to Quebec the distance, according to the survey of a railroad, by Major Robinson, is 635 miles; and this road is urged upon public attention with a view to draw over it a portion of the western trade, and place the lower provinces in the great line of communication between the grain growing regions of this continent and Europe.—

Without going into an extended examination of the merits of this project, it seems to us that it must strike every intelligent mind, that the most natural—the cheapest and best mode of obtaining a communication by railway between the Lower Provinces, and Montreal and the west, will be found, by extending a line of railway in the direction of Bangor and Waterville, Maine. From Waterville to Montreal, a distance of 300 miles, the entire line is finished or under contract for completion in 1852, and a branch to Quebec may be regarded as secured within three years from the present time.

The highest importance therefore attaches to every movement having reference to the extension of railways east of Bangor, or from the Lower Provinces in the direction of the St. Lawrence river.—One great central line for the whole State, and for European communication, once laid down, into which the various branch lines could enter, on either side as required—connected with a line extending to Montreal and Quebec—a system of railways would be secured surpassing in value and importance any that has yet been proposed.

It is not proposed to urge any one to embark hastily in the construction of the proposed line; but to so far present the advantages of this route for the great end in view, over any other possible line, as to secure for it such aid as in the progress of events, its advantages may call forth. If the practicability of the line were properly demonstrated, it is believed that it would command support from the great commercial interests of Great Britain and the United States. If already built, no one can doubt the value of the undertaking, as a mode of profitable investment. Those who may incline to hesitate, in yielding assent to the truth of this assertion, are invited to very carefully review the present condition of affairs.

The United States now embrace a territory of 2,187,490 square miles not organized into States, including Texas. If this whole territory was as densely populated as the State of Massachusetts, it would contain a population of over two hundred millions of people. The same extent of territory in Europe, under similar climate, and with fewer natural advantages, contains a still greater population, while the United Kingdom of Great Britain and Ireland has a ratio of population to the square mile more than twice as great as Massachusetts. The twenty-nine remaining states, exclusive of Texas, comprise an extent of 1,065,158 square miles more. The increase of population in the United States from 1790 to 1800, was at the rate of 35.01 per cent.; from 1800 to 1810, 36.45 per cent.; from 1810 to 1820, 33.35 per cent.; from 1820 to 1830, 33.26 per cent.; from 1830 to 1840, 32.67 per cent. It is believed that the census of 1850 will show that from 1840 to 1850, the increase has been as great as at any other period of ten years. Causes now at work tend rather to increase than diminish the ratio of increase; and many now alive will see this nation numbering one hundred and fifty millions of people.

Commercial intercourse between the United States and Europe has gone on increasing more rapidly than the population of the country. In the year 1820, the attempt was first made to establish a line of packet ships to Liverpool, to sail on certain stated days. Almost every one prophesied their failure, though embracing only two in number, and of 450 tons burden. At this time there are lines of regular sailing packets from all our large cities, embracing vessels of over 2,000 tons burden, and reaching hundreds of ships in number.

About fifteen years ago, the scientific world listened with attention to the assertion of the learned Dr. Lardner, that it was impossible to navigate the Atlantic Ocean by steam. This theory was disproved by the arrival of two steamers, the *Sirius* and the *Great Western*, in New York harbor; one from Bristol, the other from Liverpool, on the 23d day of April, 1839, both on the same day. More than twenty steamships during the present year will run as regular packets between this country and

Europe, while the number of sailing vessels is greater than at any former period.

The number of emigrants which arrived in New York in 1838, was 25,581. In 1849, the number reached 221,799. The number which left the United Kingdom of Great Britain and Ireland for the United States in 1848, was 188,233; and the whole emigration into this country in that year exceeded 250,000. In the year 1849, the number of emigrant arrivals reached 325,000; and it is estimated that the number will exceed 400,000 the present year.

Every year gives fresh impulses to the cause of emigration to the United States, and the disturbed condition of all commercial affairs on the continent of Europe is operating to invite a better class of emigrants than heretofore, embracing much of the skill and mechanical industry of Switzerland, France and Germany.

The most indifferent observer will admit that the increase of facilities for travel with Europe must increase far more rapidly for the next ten years, than at any former period. The trade between the United States and Great Britain is constantly increasing, and at the present moment beyond any former example. The exports to England in 1830, were \$24,599,666, in 1848 \$71,852,315. The imports from England in 1830, were \$22,755,040, in 1848 \$59,763,522. Both exports and imports in 1847 exceeded those of 1848, but the extraordinary demand for food occasioned by the famine in Ireland, gave an unusual impulse to trade in that year.

A route which would enable the traveller to see an attractive portion of this continent, the best portion of Ireland, and the most extraordinary work of human skill, the Britannia Tubular Bridge would of itself invite the pleasure tourist to take this route, if no saving of time or expense were secured. But it is confidently asserted that while to the man of business the same attractions would be offered by the plan proposed, the expense of a trip to Europe can be largely reduced, while it shall save him much if not all uncertainty as to the time of his arrival, and some days time for purposes of business.

From New York to Liverpool, in the shortest line, is 3,100 miles; the route usually traversed is over 3,900 miles. By taking the railway from New York to Canso or Louisburgh, employing the swiftest steam packet from thence to Galway, crossing the great Midland railway, from Galway to Dublin, a distance of about 120 miles, and from thence to Holyhead harbor, a distance of 63 miles, and from thence to London, by the Chester and Holyhead and London and Northwestern railways, a distance of 263 miles—employing about 1,300 miles of railway, and 2,000 miles of steam navigation—the passage from New York to London may be reduced to seven days' time at all events, and possibly in six days, within a few years at farthest.

This can only be achieved by shortening the sea voyage, and dispensing with the vast weight of coal and other superfluous load now carried. Vessels designed for crossing the ocean with speed, should be relieved of all load not requisite for steadiness and good carriage. Ordinary merchandise will always go more cheaply in sailing vessels. Valuable goods could be transferred to boats of still greater speed, from the ocean terminus, running if necessary to the various Atlantic cities, if too bulky to go by the railway. In this way, the safest and swiftest passage would be secured. In a few years instead of a semi-weekly, a daily arrival of steamships may be expected.

One hundred through passengers a day each way by the railway, would give a most profitable business to the road, in addition to its local business; and the highest price would readily be paid for the carrying of the mails. The British and the American governments would willingly enter into a perpetual or permanent contract for this service, at rates of compensation representing a capital equal to one-third of the entire cost of the line. If the proper surveys were now completed, and the necessary charters granted, for a continuous line from Bangor to Whitehaven or Halifax, the scheme would offer inducements for the employment of capital, unsurpassed by any enterprise of the age.

Looking forward but 25 years only, we shall see this government containing fifty millions of people. Its great rivers and inland seas—its mineral wealth

and inexhaustible soil—within a latitude favorable to health of body and vigor of mind—all conspire to give the fullest development to the spirit of progress, requisite to supply means for the fullest gratification of every want known in the highest civilization.

Under any form of government known to civilized man, the progress of the race would be, under such influences, rapid and vigorous. When, therefore, an enterprising race, in the possession of such physical advantages as this country possesses, are stimulated to exertion by the action of a free government upon the energies of the whole people, we may confidently expect a higher development in the ideas and institutions of society, and a more practical application of knowledge to the wants and necessities of life.

Maine, from her frontier position and severe climate, has been heretofore regarded as the least favored of all the States in the Union; while it has the power to become the great manufacturing and great ship owning state of the Confederacy, if not the first in point of commercial importance.—Our climate and our geographical position, generally spoken of as our misfortunes, are in fact the great elements of our strength. The increased necessities which our climate imposes upon us, beyond those of a warmer latitude, are far more than compensated by our superior capacity for labor, our greater power of endurance, and our extraordinary fondness for exertion. With a more extended line of sea coast than any other State in the Union, and more good harbors than all the other states together, Maine will present at some future day, along her bays and rivers, a line of cities surpassing those which are now found upon the shores of the English Channel, or the Baltic Sea.

The result will be hastened by attracting into our state the great stream of European business and travel, where it shall divide into two great channels—one flowing northward into the St. Lawrence valley and the west, the other flowing southward to the great commercial cities of the continent.

Without the fertile soil of the west, or the rich deposits of coal and iron of Pennsylvania, Maine for twenty years past has not kept pace with the ratio of increase of the whole country. From 1820 to 1830, the ratio of her increase was 33.9 per cent. or about the same as that of the whole Union.—From 1830 to 1840, the rate of increase was only 26.2 per cent. Notwithstanding the healthiness of our climate, the extent of our public lands, with all the facilities inviting emigration from the more densely populated districts of New England, emigration into the state had become nearly stationary, and the tendency of our people to emigrate west remained unchecked, till the movement was made to construct a railroad from Portland to Montreal. The effect of that movement is already apparent upon the character, the enterprise, and the business of the state. A small portion only of the energy which has been applied to that undertaking, will speedily accomplish the end now proposed;—favorably affecting that great enterprise, and all the leading interests of Maine.

The time is not regarded by some persons as particularly favorable for entering upon new enterprises. The great interests of Maine, ship-building and lumber, for some three years past have been severely depressed, furnishing less returns even than investments in railways. These, in common with other business interests, are destined at times to suffer. Railway property will, however, advance in value with the growth and increase of business in the State; while it will also tend to foster industry and stimulate production in every department of labor, beyond any other mode of investment.

It is in vain to expect to retain the natural increase of our population without holding out inducements for labor beyond what are offered by the pursuits of agriculture and lumbering; and we have failed so far to attract to this state the most valuable class of emigrants, that seek for a climate and soil similar to that of Germany and Switzerland, which resembles their own. If proper encouragement was held out to them, we might expect the emigrants from the north of Europe to prefer the soil and climate of Maine to that of the Mississippi valley. Instead of this, for a series of years we

have been compelled to witness the gradual withdrawal of much of our capital into enterprises of the other states, and a departure from among us of many of the most enterprising of the young men of Maine. Real estate has advanced but moderately in value for the last fifteen years, while the new states have grown up within that brief period into wealth and importance. Our frontier position, and the want of a proper state pride and state policy, have been pointed out as the principal hindrances to the growth of Maine. The opening of the great avenues already in progress and proposed, placing Maine in the direct line of the great commercial intercourse of the globe, will create new relations in every department of business, and call into exercise such agencies as will soon give to Maine a strength and a position equal to that of any portion of the Union.

The present period seems to us favorable for the proposed movement. An experiment is now making to run steamships from Galway to Halifax, aided by the great Midland railway company of Ireland. The capital of this company is £2,596,666, or more than 12,000,000 of dollars.

This company has a direct interest to subserve in inviting the travel between this country and Europe upon its road. The same is true also of the Chester and Holyhead and the London and Northwestern railway companies. These companies, with their various branch lines—under one management—embrace nearly one eighth of the entire traffic of the United Kingdom. The London and Northwestern railway company, Aug. 1, 1849, owned 478 1/2 miles of road already finished—built at a cost of £30,617,620, or \$150,000,000—60 3/4 miles more in progress, and held the leases of over 200 miles more—including the Chester and Holyhead railway, representing a capital of at least 200,000,000 of dollars. Amid all the depressions of railway stocks and business, for the last few years in England, the stock of this company has never been sold except above par; and by the present advances from Europe, was selling at an advance.—The influence of this capital will be brought at once, in aid of any line that shall bring across Ireland to Dublin the travel of this continent. The same motive which induced the British government to aid the construction of the Britannia Bridge—to obtain the most direct route from London to Ireland—will lead them to favor the plan herein proposed.

Believing, therefore, that the state has only to display to the business community the practicability and advantages of this great route thro' Maine, to ensure at the proper time its completion, we respectfully ask your honorable body to cause the line from Bangor to St. John to be surveyed at the expense of the state, and such further measures adopted as will give proper encouragement to the undertaking.

June 12th, 1850.

JOHN A. POOR,
JOSIAH S. LITTLE,
JAMES B. CAHOON,
JOHN M. WOOD,
CHARLES Q. CLAPP,
FRANCIS O. J. SMITH,
LUTHER JEWETT.

From the Glasgow Practical Mechanics Journal.
A Chapter in the History of Railway Locomotion.

Continued from page 337.

Shortly after this trial, Mr. Stephenson being anxious to investigate the "Sanspareil's" blast pipe, despatched a nocturnal visitant to inspect it, and take its dimensions. Our informant on this little piece of finesse, is the actual person who made the survey—he is still living. The result of the observations which he made was, that a similar blast pipe was constructed and fitted to the "Rocket." The actual working efficiency of the Sanspareil has been tolerably illustrated in Mr. Armstrong's work on steam boilers, where he says that—"the original Sanspareil of Mr. Hackworth, which all but successfully competed for the prize at the opening of the Liverpool and Manchester railway, may still be seen regularly working on

the Bolton and Leigh railway, apparently not much worse for seven years' constant work, the boiler never having required any essential repair, while its contemporary rivals, that have escaped the fate of the 'scrap heap,' have been remade, and mended over and over again, since the celebrated race at Rainhill, a fact which goes far to prove that the principle of this engine has not been so very much improved upon, except that it is not so well calculated for burning coke as coal.—The Sanspareil may frequently be seen at the Kenyon Junction, waiting for the Bolton trains from Liverpool, and plans of it may be seen in Dr. Lardner's work."

In one point the Rocket possessed a feature of eminent superiority, which has since proved to be the main-stay of the modern locomotive—in the small flue tubes—the invention of Mr. Henry Booth, the talented secretary of the Liverpool and Manchester line, to whom railways owe much of their present practical efficiency.

The extreme lightness of the engines insisted on by the directors, led to an objection against the Sanspareil, on the ground of an excess of weight; but it was forgotten, that although in gross weight she exceeded her rival, yet on neither pair of wheels was there so great a pressure as in the latter. At this time, when each engineer was feeling his way, some curious specimens of locomotive mechanism were turned out. A letter written to Mr. Hackworth, by one of the directors of the Stockton and Darlington line, gives a facetious account of an engine supplied to that line by Messrs. Stephenson—"I should have been extremely glad to have heard that fair play had been allowed to the different engine makers who were competitors for the premium; from the very cool reception that a *Timothy* received from Forth street, George showed very plainly that he was much afraid of the Shildon production; and well they might, as they well know that every engine which they have yet sent, has had great need of mending. The new one last sent was at work scarcely a week before it was completely condemned, and not fit to be used in its present state. The hand gear and valves have no control in working it. When standing without the wagons at Tulley's a few days ago, it started by itself when the steam was shut off, and all that Jem Stephenson* could do, he could not stop it—it ran down the branch with such speed, that old Jem was crying out for help, every one expecting to see them dashed to atoms; the depots being quite clear of wagons, this would have been the case, had not the teamers and others thrown blocks in the way, and fortunately threw it off.

"A similar occurrence took place on the following day, in going down to Stockton. As soon as the wagons were unhooked at the top of the run away goes *Maniac*! defying all the power and skill of her jockey, old Jem, nor could it be stopped till it arrived near the staiths. Had a coach been on the road coming up, its passengers would have been in a most dangerous position. The force pump is nearly useless, having had, every day it was at work, to fill the boiler with pails at each of the watering places. No fewer than three times the lead plug has melted out. This *Maniac* was a Forth street production, and at last was obliged to be towed up to the *hospital* by a real *Timothy*† in front, on six wheels, and actually had twenty-four wagons in the rear as guard. It is now at head quarters at Shildon.

* Brother to the late Mr. George Stephenson.

† Royal George engine.

"From what I have heard of the doings with you it appears that the engine which had a *Booth* as the inventor of the copper pipes in the boiler, was, without either judge or jury, to be the winner."

On Mr. Hackworth's return from Liverpool, he found the Rocket lodged in the shed, awaiting his arrival: and, as the company's engineer, he had to put her in the best possible repair. From the defective construction of the hand-gear, and the imperfection of her force-pump, these details had to be completely remodelled.

The next engine which figured conspicuously on the Stockton and Darlington line was the "Globe," which was the first ever designed with a crank-axle. She was built from Mr. Hackworth's designs, by Messrs. Stephenson, as the Railway Company's funds were too full to allow of the work being done at their private establishment. The novelties carried out in her were—the crank-axle working by cylinders beneath the boiler, and a modification in the hand-gear, whereby the reversing was effected by a single lever—two drivers being placed on the axle, one on each side of the pair of eccentric sheaves. The wheels were four-in number, 5 feet diameter, being the largest then in use. A single flue ran straight through the boiler, having the fire-grate in one end. A number of small tubes were also passed through the diameter of the main flue, so as to form a species of spiral, the water being allowed to circulate through them. This arrangement effectively exposed a considerable surface to the action of the heat; and her steam-generating powers were much superior to any other engine of her time, having the same area of heating surface. Still, at this date, a great objection existed in the slow circulation of the water through the tubes, and the consequent accumulation of mud in the horizontal tubes, which, forming an incrustation, speedily destroyed them. Another novelty in her construction was the placing a copper globe on the top of the boiler, to serve as a steam receiving dome—hence arose her name. This engine opened the branch line between Stockton and Middlesbrough, a distance of four miles. Her rate was frequently fifty miles per hour.

All constructive innovations are invariably looked upon with distrust by the merely practical man—and when the designs for this first crank-axle engine were laid before Messrs. Stephenson for their execution, an objection was raised by one of the officials of the establishment, that the crank axle would certainly involve a loss of power, as the efficient length of lever could only be calculated from the inside of the journal to the axle's centre.

In 1830, an increase of traffic on the Stockton and Darlington line, requiring an addition to the working stock of engines, two different modifications were designed by Mr. Hackworth. Both these were six wheelers, spring mounted, and coupled throughout; the boiler of the first kind being 13 feet long. The flue consisted of a main tube 1 foot long, by 2 feet 6 inches diameter, in one end of which the fire grates were inserted. The other end was separated from the boiler by a partition-plate, into which a number of small copper tubes, 1 foot in length, were inserted, for the conveyance of the vapor through the remaining portion of the boiler to the smoke box, which was at the contrary end to the fire. The cylinders were placed vertically at one end of the boiler, their connecting rods being attached to a crank shaft directly beneath.—This was a plain shaft, with two cranks keyed on its ends at right angles to each other. From these cranks, coupling rods passed to similar cranks on

the axles of the whole set of wheels. The slide valves were actuated by two eccentrics, having a single lever reversing apparatus; the force pumps being worked by the same eccentrics.

In the second arrangement, the distinctive feature was in the heating surface—the valve gearing, cylinders, wheels and connections being as before, except that the cylinders were mounted on framing projecting six feet from the boiler. The boiler was ten feet long, by 4 feet 4 inches diameter, and the arrangement of heating surface presented some novelties now much in use in the northern English counties, and termed a "return multitubular fire tube." It consisted of a main tube, 2 feet 4 inches diameter at the large-end, reduced to 2 feet at the opposite end, and 8 feet long. The large end contained the fire grates, and at the small end, a box of a D shape was placed to receive the heated vapor after its passage through the main tube, conveying it back again through the water by a number of small copper tubes, surrounding the large tube on all sides except the bottom, being inserted in the tube box at one end, and in the plate forming the end of the boiler at the other. At the fire end, a semicircular box carried the smoke into the chimney. This arrangement proved to be the best of its day for the general traffic of the line, as well in its economy as in its durability, the flues having been repeatedly known to wear for six years without removal. It also afforded the means of a convenient removal of the heating surface, so that in an engine provided with a duplicate heating surface, the old one could be removed and a new one added, ready for work within three days. It is said that these engines have performed a greater amount of duty than any others extant.

We have now glanced at the various gradations of improvement in the early stages of locomotive building, which it is impossible to contemplate without paying a deserved tribute to the great ability displayed in this branch by Mr. Hackworth, at a time when everything had to be learned—when, indeed, engineers were utterly thrown upon their own resources. No later than 1846, one of the agents of the Stockton and Darlington company stated, in reference to the first class of engines we have described, that, "take them weight for weight they surpass any engine on the line."

If George Stephenson deserved the title of the "Father of Railways," we think we may at least claim for Timothy Hackworth that of the "Father of Locomotives."

Lord Rosse's Telescope and the Binary Stars.

We extract from a recent English publication the following interesting remarks on the discoveries made by Lord Rosse's telescope respecting the phenomena of binary and multiple stars. The concluding suggestions open a new world of speculation in astronomy and geology, and afford materials for thought such as very few scientific discoveries have presented to the curiosity of man:

To Sir William Herschell the honor of discovering this extraordinary combination of the heavenly bodies is due. That great man remarked that there were many instances of two stars being placed so close together as to appear to the eye as one, it being only by means of the telescope that their separate orbs could be described. This might, no doubt, if it happened in one or two instances, have been the accidental effect of their rays combining as they reached the earth—the stars themselves being sufficiently far apart in distance, if not in direction. But extended observations soon showed that this combination occurred far too frequently to be the mere effect of accidental similarity of direction; there is no position in astronomy better es-

tablished than the fact, that two, three or more stars, may be found in combination revolving round each other, and exercising a combined influence on the planetary systems relating to each. The matter has been especially followed up by Sir John Herschell, the illustrious son of an illustrious sire, and his speculations are not among the least interesting which are brought before the reader. It has long been known, and may in fact be detected without the aid of an instrument, that the stars are not all of a uniform color. The same diversity prevails among the combined stars, and in all probability that diversity will be felt in the planets under their control. "It may be easier suggested in words," says Sir John, "than conceived in imagination, what a variety of illumination two stars—a red and a green, or a yellow and a blue one—must afford a planet circulating around either, and what cheering contrasts and grateful vicissitudes a red and green lay, alternating with a white one and with darkness, must arise from the presence or absence of one or other, or both from the horizon."

But the most important consideration arising out of a view of these complex arrangements, is the duration of the season thus caused by their combined influence, as ascertained by the orbits in which the stars and their systems move. In our own system, the centre of gravity, undisturbed by any other large mass, lies near the centre of the sun, and the planets accordingly roll round that luminary in an orbit so nearly circular as to produce seasons of almost equal duration. But it is not so with the complex systems under consideration. In the presence of several luminaries, each of them exerting the force of attraction, in proportion to their bulk, the centre of gravity must reside with neither, but at some point apart from both; and hence the motion of the dependant planets must be more or less elliptical, considered in relation to the suns on which they depend, according to the complexity of the arrangement. This shows how recent discoveries in astronomy may be made to throw light upon the not less extraordinary disclosures of the sister science of geology.

When speaking of the double stars, I offered some general remarks on the changing distances of these orbs; and the effect of such changes on schemes of planets connected with them. Let us look again at the subject, in reference to the more complex system now before us. The result of the ellipticity of the orbs of the closer pair, within the large curve of the diagram immediately preceding is—as I have explained—to give a planet rolling around either sun *two sets of seasons*—one depending on its own revolution or year, and the other on *the revolution of its sun*; for during this latter cycle—fifty-eight years in the case of CANCER—it might be carried from a distance to that neighbor orb, as far as NEPTUNE, is from a luminary, to a proximity as great as VENUS enjoys. In reality, here are years, with their varying seasons, of different lengths, inseparably intermingling; nay, the course of the shorter year can be reckoned an *incident* only—a recurring variety—within that larger one, which doubtless always comprehends many of its returns. As the grand summer and winter succeed there must come and pass away numbers of minor periods of comparative life and luxuriance, diversifying that longer course; but only when the planet's summer coincides with the summer of its sun, will the glory of its seasons attain its culmination. In the scene before us there is, however, yet another element. Passing slowly along a career far more majestic, another orb is advancing, with a cycle of seasons grander still. That orb brings its *third* summer to superadd to the foregoing complexity—one which, in the case we have spoken of, arrives but once in six hundred years; and who shall picture or conceive the effects on all life, on all action, and every internal arrangement of these orbs and their dependants, when, in virtue of the mechanism they constitute, the three suns attain their greatest proximity and shower on each other their most abundant influences.

Nor are cycles thus momentous limited in their periods. I spoke before of MIZAR and ALCOR. One of these is a double star, and with the distant ALCOR, that inferior system forms a scheme such as I have just described, except that its grand year—that of intense summer and deepest winter—may return only after 180,000 of our terrene units!

Would we seek an analogon amid phenomena of the earth to alternations thus stupendous? There is no point of precise resemblance, but can one unroll the mysterious volume of which our rocks are the various leaves, without discerning indications of what also may be grand summers—periods of intense, all vivifying heat—under whose beneficence a tropic vegetation covered the Poles? In a previous page I used the word *bouleversement* or *catastrophe*, and truly, when one thinks of the immense width of fluctuation inevitable on provisions like these, or of the opposite conditions of every member of such a system in different epochs of its existence; still farther, if, as alone we know of the remote past, or even the larger relation of the present, fragments, rapid glimpses of movements far apart, or of detached portions of such a system, were all that rested under the eye, how could the word catastrophe be avoided on the idea of something diverse from peaceful and solemn Law, which by overthrowing order had instituted disturbance and change! Yet, in the deep quiet of the night, look at a triple star, and with your reason follow the motions of its orbs! So would confusion vanish and perplexity be felt no more if, from a height superior to that which is its summit now, Man could behold unwinding the full destinies of the World.

Institution of Civil Engineers.

The paper read was "On the Construction of the Permanent Way of Railways; with an account of the Wrought Iron Permanent Way, laid down on the Main Line of the North Midland Railway," by Mr. W. H. Barlow, M. Inst. C.E.

The author commenced by entering into the question of the maintenance and renewal of the ordinary railways, analysing very minutely the expenses under the different heads, and showing to what causes the derangement of the line might be attributed. The cost of maintenance was stated to be dependant on two causes—the effect of weather, &c., and the disturbance produced by traffic; and from a summary of the expenditure of the different lines belonging to the Midland company, it appeared that the former amounted to £20 or £30 per mile per annum, and the latter varied from 2d. to 2-7d. per train per mile. After a line was consolidated, by far the greater part of this expenditure was due to the derangement caused by the passage of the trains, which first produced an uneven joint, then loosened the joint key, and then disturbed the sleeper, so that at length the whole of the permanent way generally was degraded. With regard to renewal, it had been estimated by the officers, of the London and Northwestern railway, that on their line the rails would last 20 years, and the sleepers, if "creosoted," 20 years, but if unprepared only twelve years; now, as the duration of service of the rails was dependant on the amount of the traffic, and that of the sleepers on the weather, it was quite evident that on lines having less traffic than the London and Northwestern, the proportionate expense of renewing the sleepers would be much greater, and would increase as the amount of traffic diminished.

In endeavoring to seek a remedy for this, the author conceived that, by increasing the dimensions of the bridge rail, sufficient width might be obtained for it to take its own bearing in the ballast, without the use of either transverse sleepers or longitudinal supports; and, moreover, that such a construction would possess great strength, be very durable, and be capable of being renewed at moderate expense. He therefore proposed a bridge rail, 13 in. in width, 5½ in. in depth, and weighing 126 lbs. per lineal yard. There was some difficulty at first in getting it manufactured, but Messrs. Bolekow and Vaughan, of Middlesborough-on-Tees, had overcome all the practical difficulties, and now produced rails of the required size, with hard metal in the upper portion, and ductile metal in the lower, by which both durability and strength were insured. The joint was made by either a cast or wrought iron chair, or saddle, which received the ends of the rails, and into which they were keyed with wooden keys. The guage was preserved by means of a tie-bar, fitted and keyed into sockets on the chairs.

An experimental length of road on this construction had been laid down on the main line of the

North Midland railway, the cost of which was \$3323 per mile; but it was thought that, in future, this might be reduced to 2487 per mile, by reducing the weight of the rails to 100 lbs. per yard, and the chairs in proportion, as it was found by experiment that those rails were greatly in excess of strength being as much as three times stronger than that of the ordinary double-headed rail.

A mile of road had also been laid upon the same line, with cast iron sleepers adapted to the ordinary rail, as introduced by Mr. P. W. Barlow, M. Inst. C.E.; and another mile had been laid with these cast iron sleepers at the joints only, but having intermediate sleepers of timber. The motion of the trains over their several experimental lengths was firm and steady, there being no perceptible difference between the two latter descriptions.

In the discussion which ensued, in which Messrs. Hawkshaw, I. K. Brunel, Locke, M.P., P. W. and W. H. Barlow, and Glynn, took part, the relative advantages and disadvantages of the different systems of permanent way in present use were discussed, and also, in some slight degree, compared with that proposed by Mr. W. H. Barlow; but it appeared to be a general opinion, that no one system of laying a permanent road could at present claim a great superiority over any other; and that, in reality, much more depended on the good quality of the materials used in its construction, than in any particular way of laying it. The objects to be attained were—simplicity of construction, so that there should be as few parts as possible to get out of order, a perfect joint, and economy of maintenance; and though the two first of these desiderata were admitted to be obtained in a permanent way with bridge-shaped rails and longitudinal timber sleepers, it was contended that they were, to some extent, counter-balanced in a road laid in the ordinary manner, with double-headed rails and cast iron chairs, as in some instances, after being turned, the second table was found to be more durable than the first.

Whatever might be the result of the discussion, it was admitted that the subject was one of great importance, and that the introduction of any improvement in so vital a point as the "permanent way," would confer a great boon on railway property.—*Min. Jour.*

The English Iron Trade.

SIR—Having been carefully watching the course of the iron trade generally, and especially that of Scotch pig iron, the fears expressed, in my letter published in your Journal of the 13th April, that unless the demand was sufficient to raise the prices permanently, a decrease would take place in the production, it is now quite evident that such anticipations were correct, as the makers have determined to blow out one-third of the furnaces lately in blast; and this determination is now being carried out. At the present time, there are about 45 furnaces out, owing to the strike of the colliers. How long this strike may continue is uncertain; but should the colliers determine to accept the master's terms, still one-third will remain out for at least two months, and probably until a higher range of prices is established than has existed during the last two years, and pig iron become once more remunerating to the makers. The object appears likely to be attained, as the reduced make will, from present appearances, be soon overtaken by the consumption; for upwards of 41,000 tons were shipped during the month of April, and to this must be added the quantity taken for local consumption by foundries and malleable iron works, which is variously estimated at from 5500 to 6000 tons per week; but may be safely taken at the lower quantity, say 22,000 tons per month.

Now, if 15 furnaces, which belong to the malleable iron makers, and consume all their make, are deducted from the total number in blast at the commencement of the year, there remain 97 furnaces; of these, one-third are put out by the makers, leaving only 65 furnaces to supply the general demand, even should the colliers return to work.

If the quantity of iron produced by the above 15 furnaces (say 1700 tons per week) be deducted from the quantity consumed locally (say 5500 tons) there remains 3800 tons per week, or 15,200 tons per month, which, added to the shipments for April, gives a total of upwards of 56,000 tons for ship-

ments and consumption generally; so that, if the demand continues in the same proportion, which, however, can scarcely be expected, the stock at the end of the year would be reduced to almost nothing; but I assume that, for the remaining eight months, from May to December inclusive, the shipments will reach the monthly average of last year—viz:

31,500x8=252,000 ship- [ments.]	65 furnacesx110 tons of merchandise iron for sale, after deduct- ing their own consumption=
15,200x8=121,600 local cons. [gen.]	7150
373,600	35 weeks.

250,250
230,000 present stock. as
generally estimat-
[ed.]

480,250
373,600

106,650 tons stock, Dec.
[31, 1850.]

You will observe, it is assumed, that the shipments will only reach the average monthly shipments of last year; but as they have considerably increased in April, and it is generally believed that the stocks at Runcorn and Fleetwood are considerably reduced, it may fairly be presumed that more will be shipped during the present year than during the last, and the stock, consequently, be further decreased.

I hand you a statement of the shipments for April:—

From Bromielaw, Port Dundas, and Kirk- intulloch.....	Tons 23,797
From Ayr, Ardrossan, Troon, and Linne....	9,501
From Charlston, Bo'ness, Leith, and Alloa....	6,728
From Greenock and Port Glasgow.....	1,550

Total..... 41,576

Vermont.

Vermont Central Railroad.—The directors of this road have just issued a circular stating its condition and prospects, of which we copy as follows:

This road extends from Windsor to the lake shore at Burlington, one hundred and sixteen and one-tenth miles; and is finished with the exception of two miles in Burlington, which will be completed in August.

The cost, estimating the stock at the price of the last issue and present market value, would be as follows:

100,000 shares stock at \$30.....	\$3,000,000
Bonds issued.....	597,000
Bonds to be issued for payment of interest.....	284,122
	881,122
Less assets specially applicable for payment of bonds.....	281,122
	600,000
	\$3,600,000

The issue of 50,000 shares at \$30 gives \$1,500,000, which, added to the other resources of the company, will, in the opinion of the directors, pay with the exception of the bonds for \$600,000, as above stated, the entire debts of the corporation and leave \$300,000 for finishing the road, and the income hereafter will be applied to dividends.

Vermont and Canada Railroad.—This road, for which the means are provided, extends from Essex, a point on the Central about seven miles on the Burlington, to Rouse's Point. It is about forty five miles in length. Its grading throughout the line will be finished in August, and the bridging and materials are in such a state of forwardness as to render it certain that it will be open in October.

The cost of the road will not exceed, it is believed, \$17,000 per mile, or \$765,000.

This has been taken on a permanent lease by the Vermont Central, at a rent equal to eight per cent. on its cost—representing a capital of \$1,020,000, at six per cent.; on which, in the opinion of those

acquainted with the country, it will pay the interest by local trade.

The above estimate is made on shares at the last issue, and present market value of \$30 per share; at this rate, the two roads considered as one, would cost \$4,620,000, or about \$28 695 per mile.

Estimated at cost to shareholders who have taken all the issues, it would be as follows:

20,000 shares at \$100 per share.....	\$2,000,000
30,000 " 50 ".....	1,500,000
50,000 " 30 ".....	1,500,000
Bonds as above.....	600,000
Vermont and Canada railroad as above.....	1,020,000
	\$6,620,000

or about \$41,118 per mile.

New York.

The Buffalo and State Line railroad enterprise is now placed beyond a contingency, and will be prosecuted to as speedy a completion as practicable.—The whole line is under contract and operations have been commenced.

A meeting was held in Buffalo recently, to consider the project of a railroad from Corning to Buffalo, thro' the Cohocton valley, by way of Blood's Corners, Caledonia, Le Roy and Batavia. The distance is 130 miles. Steuben county stands ready to build the road to Blood's Corners, 45 miles.—

The people of Livingston were also warmly in favor of the enterprise, so also were those of Genesee. The friends of the Attica and Hornellsville road, to construct which \$750,000 had been subscribed, were willing to abandon their enterprise and unite with the Corning project. The following committee was appointed to adopt measures for the organization of the company, viz:

Messrs. Magee and Cook, of Bath; Upham and Lamson, of Le Roy; Pringle and Cary, of Batavia; Ketchum, Tillinghast, Dudley, Phelps, Barton and Haywood, of Buffalo; and Wadsworth, of Genesee.

A committee of Buffalonians was also authorized to solicit subscriptions. It is said that this road will bring Buffalo 30 miles nearer New York than any other route.

Canandaigua and Corning Railroad.—Marvin Porter, Esq., has been appointed Chief Engineer, and with his assistants has proceeded to strike out the route.

The arrangements for the consolidation of the Auburn and Rochester and Syracuse and Auburn railroads are nearly completed, and it will take place, we understand, on the 1st of August. Previously to the union it is understood that the Auburn and Rochester road will declare a stock dividend of 15 per cent. and a cash dividend of 10 per cent., and the Syracuse and Auburn road a stock dividend of 15 per cent., and a further stock or cash dividend of 4 per cent. The recent considerable rise in these stocks has been occasioned by the anticipation of these dividends.

The total receipts of the two companies from January 1st, 1850, to June 1st, 1850, is \$301,417 62 For same time in 1849..... 239 317 06

Increase in 1850..... \$64,100 56
or 27-5 per cent.

Erie Canal.—The quantity of flour, wheat, corn and barley left at tide water during the 3d week in June, in the years 1849 and 1850, were as follows:

	Flour. barrels.	Wheat. bushels.	Corn. bushels.	Barley. bushels.
1849.....	106,207	101,846	493,808	2,045
1850.....	74,986	35,050	228,719	40
Decrease	31,221	66,796	265,089	2,005

The aggregate quantity of the same articles left

at tide water, from the commencement of navigation to the 23d of June, inclusive, during the years 1849 and 1850, is as follows:

	Flour.	Wheat.	Corn.	Barley.
1849....	664,767	364,105	1,723,884	94,081
1850....	573,310	197,824	921,752	110,625

Decrease 91,457 166,281 802,132 inc.16,544

The aggregate quantity of the same articles left at tide water, from the commencement of navigation to the 23d of June, inclusive, during the years 1848 and 1850, is as follows:

	Flour.	Wheat.	Corn.	Barley.
1848....	589,680	541,466	421,568	96,808
1850....	573,310	197,824	921,752	110,625

Decrease 16,370 343,642 inc.500,184 13,817

By reducing the wheat to flour, the quantity of the latter left at tide water this year, compared with the corresponding period of last year, shows a decrease of 124,713 barrels of flour.

Massachusetts Dividends.

The following dividends were paid in Boston on or about Monday, July 1st:

When paid.	Stocks.	Capital.	Div'd.	Amt.
July 1st.	Western railroad....	5,150,000	4 p. ct.	206,000
"	Fitchburg, do.	3,320,000	4	132,800
"	Boston and Lowell, do.	1,830,000	4	73,200
"	Boston and Wor. do.	4,500,000	3	135,000
"	Boston and Maine, do.	4,155,700	3	124,671
"	Boston and Prov. do.	3,160,000	2½	79,000
"	Manches. & Law. do.	500,000	3	15,000
"	Connec. and Passum. do.	1,086,400	3	32,592
"	Pittsfield and N. Adams.	45,000	3	13,500
"	Dorches. and Milton, do.	130,000	3	3,900
"	on bonds..			4,000
Interest on	Old Colony railroad bonds			10,000
"	Cheshire "			18,921
"	Albany bonds western "			30,000
"	Michigan Central "			25,000
"	Vermont do. bonds payable 1852.			9,030
"	Vermont and Massachusetts do.			16,000
"	United States loan about			20,000
"	Boston city stock			40,000
"	Massachusetts 5 per cent. do.			12,500
"	Norwich city do.			6,000
Middlesex Manuf. Co.	1,000,000	3 p. ct.		30,000
Manches. Print Works.	1,200,000	4		48,000
Nashua Manuf. Co.	1,000,000	3		30,000
Chicopee do.	700,000	2		14,000
Jackson do.	480,000	3		14,400
Cabot do.	500,000	3		15,000
Lowell do.	on 1900 shares \$20 per share.			38,000
Clinton do.	400,000	7½		30,000
Cocheco do.	on 2000 shares \$26 per share.			52,000
New England Worsted do.	450,000			
Franklin Insurance Co.	300,000	10		30,000
American do.	300,000	10		30,000

July 8. Boston and Sandwich Glass Co.	\$1,518,514
" \$300,000 3 per ct.	\$9,000
" Lancaster Mills on 2000 shares \$13½	27,000
" 10. Boston Exchange Co. \$325,000 3½	11,725
" 15. Eastern railroad \$2,850,000 4...	114,000
" N.H. 492,500 4...	19,700
" Interest on Massachusetts State 5 per cent. stock issued for the Western railroad company	24,875

\$1,724,814

There are several other payments of dividends and interest to be made during the month, which it has been impossible for us to obtain with cor-

rectness, and which will greatly increase the amount.

The Patent Office report contains the following meteorological tables and statistics respecting the temperature and fall of rail in various parts of the United States, compiled from the accounts received at that office:

MEAN ANNUAL DEPTH OF RAIN.

	Inches.
Fort Constitution, N. H.	28-85
Watertown Arsenal, Mass.	39-69
Fort Hamilton, N. Y.	45-71
Hancock Barracks, N. Y.	36-92
Watervliet Arsenal, N. Y.	34-22
West Point, N. Y.	48-70
Alleghany Arsenal, Penn.	28-14
Dearbornville Arsenal, Mich.	31-30
Fort Brady, Mich.	31-89
" Howard, Mich.	38-83
" Winnebago, Mich.	31-88
" Snelling, Minnesota	30-32
" Crawford, Wisconsin	29-54
" Leavenworth, Missouri	32-68
St. Louis Arsenal, Mo.	24-12
Fort Smith, Arkansas	35-64
" Gibson, "	30-64
" Towson, "	46-73
New Orleans Barracks, La.	51-85
Fort Wood, La.	47-90
Key West, Florida	31-39
Charleston, S. C.	33-89
Fort Monroe, Va.	52-53
" McHenry, Md.	40-80
Washington, D. C.	34-62
Baltimore, Md.	39-90
Boston, Mass.	39-23
Hanover, N. H.	38-00
State of New York	36-00
" Ohio	36-00

MEAN ANNUAL TEMPERATURE IN 1849.

	Fahrenheit.
Cambridge, Mass.	47-48
New Haven, Conn.	49-00
Rochester, N. Y.	46-68
Penn Yan, N. Y.	45-46
Newark, N. J.	50-89
Delaware Co., Pa.	52-37
Near Louisville, Ky.	53-8
Columbia, S. C.	61-62
Jackson, Miss.	65-64
Fort Madison, Iowa	49-62

Sale of Worcester Railroad Bonds.

Three Hundred Thousands dollars of the Bonds of this Corporation were sold at auction this morning, by Whitwell, Seaver & Co. The prices paid were as follows,

\$10,000 at 6 p. cent advance.
2,000 do 4 do do
5,000 do 3½ do do
10,000 do 3½ do do
10,000 do 3 do do
18,000 do 2½ do do
245,000 do 2½ do do

\$300,000

The largest purchaser was Mr. Samuel Henshaw, who closed the balance of \$ 35,000 at 2½. The sale was well attended, and the bidding quite spirited. The Bonds are payable in 1860, with 6 p. cent interest, semi-annually payable, at the Hamilton Bank; Coupons attached. They are convertible into stock at the option of the holders.—*Boston Shipping List.*

Interior Iowa.

We have just conversed with Mr. Wm. Morrison, State Agent for the selection of school lands. He has returned from a trip to the interior, and gives a glowing description of the advantages, both mineral and agricultural, of the region of country bordering the upper Des Moines river. Coal and gypsum abound in that region, and will form, at no distant day, two of the great staples of export and home consumption.

Were the facilities of transportation such now as they one day will be, the extensive prairies which lie unbroken by the hand of industry, would

soon teem with lowing herds and wave with golden grain. A railroad to Fort Des Moines will realize all the best anticipations which have been indulged in the usefulness and efficiency of such a project. *Dubuque Express.*

The Climate of California.

The following results of a Meteorological Journal kept in California from July 26, 1849, to April 1, 1850, will be found exceedingly interesting:

SAN FRANCISCO, Lat. 37° 49', Long. 112° 8' W.		
Highest range from July 28 to Aug. 2.....	54	70
Lowest " " " " " " " " " " " "	51	66
Average " " " " " " " " " " " "	52½	68
" on river San Joaquin, Aug. 2, 3		
and 4.....	62	91
" at Stockton, from Aug. 5 to 13.....	58½	92
" from do. to Stanislaus, Aug. 13		
to 20.....	60	98
Highest range at Sullivan's diggings from		
Aug. 20th to Oct. 2d.....	70	103
Lowest " " " " " " " " " " " "	44	72
Average " " " " " " " " " " " "	61½	92
Highest range in Nov. at San Francisco.....	59	71
Lowest " " " " " " " " " " " "	45	58
Average " " " " " " " " " " " "	53½	68½
Highest in December " " " " " " " " " " " "	56	70
Lowest " " " " " " " " " " " "	30	52
Average " " " " " " " " " " " "	43	59½
Highest in January " " " " " " " " " " " "	53	73
Lowest " " " " " " " " " " " "	30	49
Average " " " " " " " " " " " "	45½	60½
Highest in February " " " " " " " " " " " "	52	76
Lowest " " " " " " " " " " " "	36	52
Average " " " " " " " " " " " "	49	62
Highest in March " " " " " " " " " " " "	60	85
Lowest " " " " " " " " " " " "	34	49
Average " " " " " " " " " " " "	44½	66½

First rain of the season August 16th, few drops, perhaps 8 or 10 to the square foot; about the same again on the 23d of the same month. First rain of any note Oct. 9th.

No. of rainy days in	October.....	3
"	November.....	14
"	December.....	15
"	January.....	20
"	February.....	6
"	March.....	19

Whole No.....77

Greatest number in succession 12, commencing 12th, and continuing every day until the 23d. Probable quantity of rain up to December, 12 inches.

Quantity fell in December by rain gauge....	11-25
" January " " " " " " " " " "	6-00
" February " " " " " " " " " "	1-31
" March " " " " " " " " " "	4-03

Whole amount.....34-78
or 2 feet 10 78-100.

Commerce of Baltimore.

We copy from a late Congressional document the following statistics relative to the commerce of that city:

The total value of goods shipped from Baltimore during the year ending June 13th, 1849, was \$8,000,600; of which \$7,786,695 were of articles of domestic produce, and \$213,965 of foreign articles. The exports were in 634 vessels, with a tonnage of 149,928 tons, and employing 6,335 men in their navigation. Of the above, 491 vessels were American, and 145 under the flags of 18 different foreign nations.

The foreign imports into Baltimore during the same time were valued at \$4,976,731, of which, \$4,613,219 were in American vessels, and \$363,512 in foreign vessels. The foreign imports were received in 484 vessels, with a tonnage amounting to 110,068 tons, and manned by 4,581 men.

The total number of vessels owned and registered at Baltimore on the 30th June, 1849, embraced an aggregate tonnage of 134,025 35 tons, of which 53,624 75 tons were engaged as licensed coasters, and 11,464 28 tons employed in steam navigation.

During the same year there were built at Baltimore 63 vessels, viz: 9 ships and barks, 8 brigs, 41

schooners and 5 steamers, with an aggregate tonnage of 12,199-66 tons.

The Effect of Shot and Shell on the Hull of Iron Vessels.

The first experiment for testing the effect of shot and shell on the sides of iron vessels took place on Wednesday at Portsmouth, England, under the superintendence of Capt. Chads, on board the *Excellent*. A large butt, being a copy of a section of the *Simoom's* main deck, had been made in the dockyard, representing the two sides of an iron vessel, each side of the strength and consistency of one of the large iron steamships. This was but erected on the mud, at a distance of 460 yards from the *Excellent*, and the practice took place at high water from guns of several calibre, and various charges of powder, both shot and shell were fired. The results show pretty conclusively that iron vessels are not fit to cope with vessels of wood, neither are they fit to go against batteries, for it is now tolerably certain that the fatal effects of every shot received on board would be quadrupled by the tendency of the ironwork to splinter, fly off, and destroy everything in the vicinity of the concussion more especially when the ball is also likely to split, and break to pieces likewise.

The Projected Railroad to Halifax.

The following paragraph in relation to the project to connect Halifax with the Atlantic cities of the United States, by means of a railroad through New Brunswick to Bangor, in Maine, etc., we copy from a St. John, N. B., paper.

Mr. Morton, an engineer of high respectability and attainments, from the United States, recently arrived in this Province with the view of ascertaining what steps can be taken for the purpose of extending a line of railway through this Province, from the State of Maine, in order to connect the traffic from Europe with America through this Province and Nova Scotia. Mr. Morton visited Halifax, and the Nova Scotian thus speaks of him and his project:

"Mr. Morton appears to be a very gentlemanly and well informed man. He states that there are four wealthy and influential corporations interested in the success of the Maine lines. That each of these have a direct interest in the extension of a line to Halifax, either by a powerful steamer from Portland to Windsor, with rail to Halifax, or by steamer to Digby, with rail to the Gut, or round the Bay by Cumberland, to connect at our frontier with the lines which may be formed by the governments and companies of New Brunswick and Maine.—Mr. Morton is indifferent which route is taken, provided it be the shortest, best or most profitable. In the construction of one or the other, he is quite confident that we shall have the cordial sympathy, if not the active support of the associations already formed among our neighbors."

Ohio.

Mad River and Lake Erie Railroad.—Judge Lane, President of the Mad River and Lake Erie railway company, lately submitted to the directors a brief annual report of the affairs of the company for the past year. The following is a statement of the receipts and expenses for the year ending May 31st:

Receipts for passengers.....	\$361,155 41
" freight.....	163,044 20
" mail.....	6,358 44
" incidental.....	2,618 44
	361,155 49
Running expenses and repairs.....	168,879 69
Balance.....	192,275 77
Interest account.....	47,657 04
	144,618 73
Dividend No. 2.....	121,057 25
Surplus earnings.....	23,568 48
Balance trans account, 1st June, 1849.	10,215 49
Total surplus.....	\$33,783 97

The company expended \$165,500 the past year

on the branch from Springfield to Dayton. This branch is to be open for travel during the approaching autumn.

Vermont.

Rutland Railroad.—At a recent meeting of the Stockholders of this road, the following Board of Directors were chosen:—

Timothy Follett, Burlington, President; Samuel P. Strong, Vergennes; Charles Linsly, Middlebury; John A. Conant, Brandon; Chester Granger, Pittsford; George T. Hodges, Rutland; Nathaniel Fullerton, Chester; Wm. Henry, Bellows Falls; Paris Fletcher, Bridport; John Howe, Nathan Rice; and B. T. Reed, Boston; John Bradley, Burlington. The last in place of Mr. Elliott of Keene, who declined a re-election.

The meeting resolved—

1. To pay the interest due stockholders in new stock at par.
2. To apply to the Legislature for permission to issue bonds to an amount not exceeding \$1,500,000.
3. To request the Legislature to amend the charter as to allow the company to diminish the number of directors at their discretion.

A very large number of stockholders were present, and they adjourned in perfect confidence in the success of the enterprise and the management of the directors.

Illinois.

A large convention of citizens of Southern Illinois met at Mount Vernon on the 6th inst. to consider the Railroad question. The meeting was well attended, and strong resolutions were passed favorable to the following projects:

1. The Central Railroad of Illinois, running from the mouth of the Ohio to Chicago and Galena.
2. The Ohio and Mississippi Railroad, running from Vincennes on the Wabash, to Illinois town on the Mississippi.
3. The Mississippi and Atlantic Railroad, running from Terre Haute on the Wabash to Illinois town.

Cleveland and Buffalo Railroad.

The surveys of the Ohio section of this work are now completed. The directors held a meeting at Painesville recently, and definitely and permanently located the whole road, from Cleveland to the State line. They are now engaged in securing the right of way, which will be accomplished in a few weeks. From Doan's Corners the road will pass down Kingsbury's Run, and across Walworth's Flats to the intersection of the Cleveland, Columbus and Cincinnati road.

We understand that the work will be advertised and put under contract within the next sixty days. The company having the charter from Erie to the west line of Pennsylvania, have united with the Ohio company; and will push forward the work together—making one entire road from Cleveland to Erie.

West of Buffalo to the Pennsylvania State line the whole road has been put under contract, and the contractors are now at work. It is intended to have the entire road from Buffalo to Erie completed by the 1st of July, 1851.

Illinois.

A large Convention of Delegates from the counties interested in the Illinois Northern Cross railroad met at Decatur, Ill., on the 7th ult. The attendance of delegates was large and the best feeling was evinced. It was the opinion among the delegates that one quarter of the sum needed to finish the road from Springfield to the Indiana line could be obtained along the route. Among other resolutions adopted were the following:

Resolved, That the interest of the State and especially of the inhabitants of the Central counties, requires the completion of the Northern Cross railroad from Quincy on the line located to Danville, and thence to Covington or Lafayette, and also of the construction of the Central railroad from the mouth of the Ohio river to the southern termination of the Illinois and Michigan canal, with branches thence to Chicago and Galena.

Resolved, That the directors of the Sangamon and Morgan railroad company, be requested to increase the capital stock of said company for the purpose of continuing the Northern Cross railroad from Springfield to Covington, and to open books in the counties on the line of the road to receive subscriptions to the said stock.

A committee was appointed to consult with the directors of the Sangamon and Morgan road upon this subject.

New Hampshire.

Concord Railroad.—From the ninth annual report of this road, we learn that the whole amount of its receipts are.....\$296,908 48
Expenses.....148,934 19

Balance.....	147,974 29
Two dividends paid.....	133,680 00
	14,824 29
Paid upper roads.....	9,291 42
Carried to deterioration account.....	5,032 87
Add surplus of last year.....	28,814 17
Making in whole.....	\$33,847 04

Ohio.

Railroad from Sandusky to Cleveland.—The True Delta says: "The citizens of Sandusky had another railroad meeting on the 26th. Energy and determination were manifested in the speeches, and liberality in the subscriptions. Milan pledged \$30,000, Ohio City \$150,000, Elyria \$75,000, Birmingham \$16,000, Vermillion 10,000, in case each was made a point.

Mr. Camp stated that if Sandusky City would subscribe the \$50,000 allotted in Elyria, that nothing would prevent the road from being put under contract from Sandusky to Cleveland within six weeks."

Lead Mine in Maine.

A lead mine has been recently discovered in Prospect, Me. The Belfast Signal says that the vein of ore makes its appearance in a ledge beneath low water mark, on the shore of Penobscot river, and from thence runs under ground, following the direction of the ledge. An analysis of several samples, differing from each other in value, has been made by Dr. Jackson, of Boston, which gives as a mean, seventy-five per cent. of lead and thirteen of silver.

Locomotives in Virginia.

On Thursday afternoon says the Richmond Enquirer, we were much gratified by a visit to the very extensive and busy machine shop of Messrs. Talbot & Brother, on Cary street. There we saw the large and magnificent locomotive "Roanoke," just completed for the Danville Railroad by these enterprising and intelligent machinists. The locomotive was blocked up so as to show the movements of the machinery, all but the progressive, under the influence of steam—and though unfamiliar with such things we could not but admire the solidity and elegance of the workmanship, and the ease, rapidity and smoothness with which the driving wheels revolved. We predict for the "Roanoke" great speed, when on the road—which we hope will be about the middle of July. The splendid covered Railroad Bridge over James River is rapidly progressing, and forms a very bold and striking feature as it crosses the green islands in the river. It will be completed in a few days, we hope, and a fair experiment given to the "Roanoke," which must confer new credit on Messrs. Talbot and Brother.

AMERICAN RAILROAD JOURNAL.

Saturday, July 6, 1850.

Plan for Shortening the Time of Passage between New York and London.

We present to our readers at full length a document now before the Legislature of Maine, which will naturally arrest the attention of the railroad interest of the whole country. It has been denominated by its friends a plan for shortening the time of passage between New York and London.

We feel some delicacy in speaking of this matter from the relation in which we stand toward the gentleman whose name appears at the head of the committee who signed the petition, and from whose pen the document is understood to have emanated. All who are familiar with Maine railroads, or the public men of that State, will recognise the names of those occupying the most prominent positions, embracing the Mayor of Portland, the Collector of the Port, beside those holding the most responsible offices in the railroads of Maine. It may be proper in this connection to remark that the author of this memorial to the Legislature of Maine was the projector and leading promoter of the Atlantic and St. Lawrence railroad.

We perceive that the Legislature of Maine have ordered the printing of a number of copies, and we confidently trust that they will readily cause the necessary information to be obtained. The project has been developed in a manner to arrest attention.

We are told that the substance of this memorial was presented in a speech by Mr. Poor at Bangor during the last winter.

Railroad Securities.

By far the greater part of the railroads now in progress are in the South and West, parts of the country that have but little accumulated capital. Most of the companies are therefore obliged to resort to the commercial towns for loans of money to purchase iron, equipment, etc. The preparation of the road bed for the iron often exhausts the immediate means of those building them. For all beyond that, they must borrow upon such time as will suffice to convert the means they possess into money.

A great number of these companies are now coming into market for money. A majority of the securities which they bring are the obligations of towns and counties interested in these works. As far as safety and certainty of payment is concerned, no securities can be better. They represent a mere fraction of the ability of those issuing them. The payment of them may be readily enforced by law, and the aggregate property of a whole community may be seized in discharge of the debt. The bodies asking for these loans have high standing and credit, and are every day becoming more and more able to pay.

All this is as a general rule admitted. No capitalist doubts but that the bonds of the richest counties of Ohio and Indiana for the amount of \$100,000 are a perfectly safe investment, as safe as New York or Ohio State stocks; yet these stocks command a very large premium for permanent investment, while those of counties having the same time to run and bearing the same rate of interest are at a large discount. This difference in the price of these securities is in part owing to the shortness of time they have been in the market. They have attracted so little attention that the public have not become impressed with their true value. Another cause is to be found in the interest that the brokers

by whom they are mostly negotiated have in keeping them at a low figure. If a broker can buy at 85 cents and sell at 100, the amount of one of his commissions is readily seen. Where too, a broker buys at a low figure, upon an order, his principal may wish to sell again as the value of the security rises in the market. This gives him a chance for a second commission, which he would lose if he gave in the outset all the security were worth, saving his first commission.

Here we are satisfied lies the great obstacle with which railroad companies have to contend, in obtaining the full value of their securities. The money broker and the company have exactly opposite interests: the former to buy as low, and the latter to get as much as possible. The broker is interested to keep the seller away from the capitalist, who buys for investment, for the purpose of pocketing the commission as the go-between. The systematic concert of this large, active and influential class, renders it very difficult to negotiate, without their aid, securities not already well known in the market; and their gains are measured just in proportion as they can blind the eyes or embarrass the position of the persons having securities to offer. Such persons cannot be too cautious how they show their hands to this class of men. They ingeniously worm out of the seller every fact in his case that can make for or against him, for the purpose of using whatever is favorable for their own advantage if they get the job, or against the seller if they lose it. As an invariable rule the less a security is hawked about Wall street the better. An exposure there for a few days will taint the best of them. After all, only one person can have the business of selling them, and every person consulted, and who has failed to get the job feels that he ought to have had it, and gives the scheme a kick, so that his successful rival shall carry off as few honors as possible. Every one who knows anything of Wall street, knows how easily it is for any man or body of men to throw discredit and distrust upon the best of security.

In money matters it is the same as with purchases of produce. The merchant buys at the smallest possible price, and sells at the highest he can get. He stands between the producer and consumer, and his profits are measured by the gains he can make between the two.

If a company wish to negotiate securities, the proper way for them to go to work is, to first make up their minds what they propose to do, and having done this, to select the right kind of man to aid them, a man who shall bring the seller and purchaser for investment together, and who shall be entitled to a proper commission for his services. It is time that these negotiations should be effected upon some system which shall do justice to the important improvements going on in all parts of country, and which shall receive the aid, good will, and encouragement of all.

Wheat Crop of the West.

The wheat crop is the great staple of the west. It is the only crop that gives the western farmer money. Its failure is almost equivalent to a year lost in everything that relates to public improvements. It is the great exchangeable value which the western merchant brings to N. York to buy his goods with, and railroad companies to buy iron, etc. The crop of last year was as a general rule, a failure. Its loss has affected the business of the whole country, and accounts for the tardy manner with which western payments have been made, and for

the great falling off of spring trade in our cities. The present crop bids fair to be most abundant, and we may soon expect to witness its influence in the impulse given to business of every kind, and particularly to the construction of railroads, in which the whole west is so largely engaged, and which keep almost exact pace with the abundance of her harvests.

Remington's Bridge.

We have at last seen this work which has made so much noise throughout the country. A model bridge is now being exhibited in this city. It consists of four parallel stringers or chords of white pine, firmly attached to abutments, and covered with thin pieces of wood, fastened to the stringers by screws. The chords or stringers are three in diameter where they are attached to the abutments, and taper down to one inch in the centre. The model is 160 feet long and four wide. The depression of the centre is about two feet lower than the abutments. It has a light, graceful appearance, and will no doubt sustain a considerable weight. We learn that for practical bridges Mr. Remington makes use of truss work, the top of which coincides with the line of the top of the abutments, thus making his simply a truss bridge, and no one can look at the model without seeing that the truss would be a great advantage to the bridge.

There is no new idea or principle in this bridge. The model is simply a wooden suspension bridge. This form of bridge may involve the application of a new principle with us, though rude wooden suspension bridges have been used in South America from time immemorial. If Mr. Remington uses the truss we cannot see anything new in his bridge either in principle or application. The strength of most kinds of wooden bridges in use depends upon the tensile strain of the wood, and the best are those which develop this the most perfectly.

Mr. Remington's bridge without the truss is a very pretty toy, and we cannot look upon it in any other light. If we must have suspension bridges, iron is much better material than wood. It requires no argument to prove this. It is stronger in proportion to its weight, safer, more durable, and will prove more economical in the end.

Virginia Central Railroad.

We are happy to learn that Thomas C. Ruggles, Esq., formerly of this city, has been appointed Chief Engineer of the above road. Mr. Ruggles is a skillful engineer, enthusiastically attached to his profession, in which he has had much experience, and carries with him to Virginia just those qualities needed to excite the inhabitants of that State to vigorous action, and to direct their efforts. We are glad that Mr. Ruggles' merits have been properly appreciated, and we have no doubt but that the people of Virginia will derive substantial advantage from his services.

Railroad Iron.

We learn that Gen. A. M. Robinson, President, and S. W. Roberts, Chief Engineer of the Ohio and Pennsylvania railroad, are now in this city for the purpose of purchasing iron for that company, and whatever may be thought of the general question of a protective tariff, the action of this company shows pretty conclusively that we cannot manufacture iron here at present prices. Pittsburgh is the centre of the iron manufacture of this country, and we know that the above company were very desirous of purchasing the domestic article; but as they could save about \$75,000 in the purchase of 11,000 tons by buying English iron, the directors felt it their duty to do so, however much they may

have been desirous of encouraging their own rolling mills.

Illinois.

Galena and Chicago Railroad.—The connection of the Lakes and the Mississippi by railway, is one of the great desiderata to the internal communication of the country. The difficulty and expense of transportation and travel over the ordinary roads between these great water courses, forces the produce of the upper Mississippi down that river;—nearly all of which would reach the Atlantic by way of the Lakes, if there were a railroad to connect the two. Two lines are now projected to open this communication, the Galena and Chicago and the Milwaukee and Mississippi, both having similar objects, but both so widely separated as in no way to be rivals of each other.

The Galena and Chicago railroad is now in operation from Chicago to Elgin, a distance of 42½ miles, and is now doing a very prosperous business. In addition to its proving a very profitable investment of capital, it is effecting great good by showing how cheaply roads can be constructed in the West, and how profitable they are likely to become. A few such illustrations as this road is giving will have an effect to inspire confidence of capitalists in them, and secure to their construction the aid so much needed in the outset, but which can soon be repaid after the works have gone into operation.

The whole cost of the first division of the road is \$405,382 36. In addition to this, \$35,713 20 have been expended for other items, chiefly for wood land.

The following table shows the time when the several sections of the road were opened for travel, and the receipts tip the 1st of May last.

Month.	Total receipts.	Distance in operation.
June, 1849.....	\$913 35	10 miles.
July.....	1,602 52	15
August.....	2,743 13	18
September.....	4,267 43	20
October.....	7,104 93	23
November.....	5,899 48	28
December.....	4,887 79	33
January, 1850.....	5,195 48	37
February.....	5,029 47	42½
March.....	4,893 75	42½
April.....	5,794 63	42½

\$48,331 96

The expenses for operating the road for the same time, amount to \$18,519 82, leaving the net earnings \$29,812 14.

The company have on hand at different points on the road, 3602½ cords of wood, 923 cords of which has been sawed and prepared for use. The cost is \$7,666.

The whole number of passengers conveyed upon the road, from the 1st of June, 1849, to the 1st of May, 1850, was 37,524.

From the operating of the road thus far, and from the indications already presented of its future business, the estimated receipts for the present year are:

From passengers.....	\$40,000
From freight.....	72,000
From mails.....	3,000

\$115,000

The expenses of operating the road will be about..... 35,000

Which will leave for net earnings. \$80,000

The company propose to put the second division of the road, from Elgin to Belvidere, a distance of 39 miles, under contract immediately, so that this portion of it may be completed in January, 1850.

The construction of the whole road is a matter

of much importance, from the fact that Chicago is soon to be connected with New York and all the leading Atlantic cities by railroads. None of these lines will be complete till they reach the Mississippi. They will soon reach Chicago, and the people of that city can, if they will, complete their work so as to have it opened simultaneously with these lines. A succession of a few years of good crops will give the people of northern Illinois abundant means to carry out this work. The following is a list of director for the current year:

Wm. B. Ogden, Walter L. Newberry, Charles Walker, James H. Collins, Wm. H. Brown, John B. Turner, Thomas Dyer, Benjamin W. Raymond, George Smith, of Chicago; Charles S. Hemstead, Thomas Dummond, of Galena; Thomas D. Robertson, of Rockford; Dexter A. Knowlton of Freeport.

William B. Ogden, President.
J. B. Turner, Acting Director.
J. Van Nortwick, Chief Engineer.
F. Howe, Secretary and Treasurer.

Massachusetts.

Below we give a table of the population of 32 towns in Massachusetts, with their gain since '40. They embrace about one-third of the population of the State since 1840. The returns from the remaining towns will carry the whole population up to nearly 1,000,000. This number will give an average of one hundred and forty inhabitants to the square mile:—

Towns.	Population.	Percent.
	1850.	1840. increase.
		new town. infinitum.
Lawrence.....	8,341	
Holyoke.....	3,713	
Chelsea (without North Chelsea)....	6,151	1,640
Somerville.....	3,111	888
Milford.....	4,409	1,795
Worcester.....	15,864	7,060
Roxbury.....	18,310	8,310
Brookline.....	2,353	1,123
Fitchburg.....	5,009	2,570
Cambridge.....	14,624	8,127
Fall River.....	11,170	6,451
Newton.....	5,009	2,902
Dorchester.....	8,578	4,458
Adams.....	6,050	3,639
Boston.....	138,788	93,979
Charleston (with out Somerville) }	15,881	9,984
Lowell.....	32,620	20,981
Danvers.....	7,949	5,140
Quincy.....	4,958	3,309
Greenfield.....	2,567	1,174
Pittsfield.....	5,900	4,060
Northampton.....	5,305	3,572
Randolph.....	4,625	3,232
Weymouth.....	5,166	3,630
Dedham.....	4,379	3,157
Taunton.....	10,133	7,524
Newburyport.....	9,534	7,124
New Bedford.....	16,441	12,585
Salem.....	18,846	15,162
Gloucester.....	7,416	6,394
Marblehead.....	6,070	5,539
Plymouth.....	5,717	5,180
	413,987	261,369

The above results are undoubtedly the very best illustration of the influence of railroads the world affords. There can be no doubt that two-thirds of the above increase is due to their construction.—Massachusetts has now about 1,050 miles of railroad, with an area of 7,250 square miles, or one mile of railroad to every seven square miles. The great increase of many of the most flourishing of these towns has not been owing to favorable position, or to any natural resources, they in fact being destitute of all advantages in these respects. Railroads have made them agreeable residences, and have placed them within easy access of the great

commercial towns. These artificial advantages have attracted to them a large population, engaged in manufacturing, which would otherwise have remained in the seaport towns, or who would have occupied themselves in other pursuits.

The only States that will show a greater absolute increase for the last ten years will be New York, Pennsylvania, Ohio, Indiana, Illinois, Wisconsin, and perhaps Missouri. Relatively Massachusetts increases much faster than any of the older States, and, in proportion to her area, much faster than any State in the Union. When we take extent of territory into consideration, the west can show nothing which equals the rapid growth of that State. The growth is still the more remarkable when we consider her poverty in all natural advantages. She has the poorest soil of any State in the Union, without coal or any other minerals of importance. Her progress is due almost entirely to the character and enterprise of her people, and to the manner in which she has made the most of whatever she possesses.

In everything that concerns the history of our country, the character or progress of our people, we are accustomed to contrast Massachusetts with Virginia. These two states early took the lead in all the great questions that have occupied the attention of our people, and they are now looked upon as the representatives of opposite systems and ideas which now divide the whole country.—Now, if we apply the ordinary test by which we measure the excellence of any particular policy or system, to wit, the progress made in population and wealth, how stands the account with these two States? In what is Virginia inferior to Massachusetts in natural advantages? In nothing. Virginia on the other hand is the superior in almost every particular. She has nearly ten times the area. She possesses a most fertile soil, an abundance of iron and coal, the great elements of wealth. No State in the Union has greater commercial advantages. If possessed of population and wealth in proportion to her natural advantages, Virginia at the present moment would be the richest and most populous State in the Union. As it is, Massachusetts is rapidly gaining upon her, and in 1850 will have nearly as many inhabitants. Why is this? There must be some cause for it. Will some Virginian answer?

Virginia has now commenced in earnest the construction of railroads, and her present movement it is believed will form an era in her history. But she has had railroads in operation for many years. Why do we not witness the same results following their construction there that we do in Massachusetts? Her leading towns, with the exception perhaps of Richmond, have hardly advanced an inch for many years. The population of the whole eastern portion of the State has remained stationary, if it has not actually receded, since 1830. As far as commerce is concerned, she might as well be without the magnificent harbors and rivers which penetrate her coast. Her forests are valueless, except to supply the ship builder of Maine and Massachusetts. Her water power drives no machinery. Her iron, with some few exceptions, still remains in the earth. Her agricultural exports are rapidly falling off, and are not one third what they were in 1770. Why does this State present such an anomalous picture compared with a great majority of her sister States? Will some one answer the question, what is the matter with Virginia?

New York and Erie Road.

The receipts of this road for the month of June, 1850, were as follows:

From passengers and mail \$58,227 35
From freight..... 62,320 02

120,324 42
Receipts in June, 1849..... 60,320 02

Increase..... 60,004 40

The receipts from 1st January to June 30, 1850, were..... 756,282 00

The receipts from 1st January to June 30, 1849, were..... 321,429 00

Increase..... 435,853 00

It will be seen by the above statement that the receipts for the last six months are within \$44,000 of the entire receipts of last year, when they reached \$810,000. Should the above rate of increase continue during the remainder of the year, and the extension to Hornellsville in September next prove as productive as anticipated, the receipts of 1850 will reach \$1,800,000 instead of \$1,600,000 as originally estimated. These receipts would leave \$900,000 net income, from which to pay interest on debt and dividend.

Harlem Railroad.

The earnings of this road for the month of June show an excess of \$10,000 over June of last year. Nearly all this increase is from the business of the road proper, and not from the New Haven. Negotiations are going on to extend the Harlem from Dover to Chatham, where it will unite with the Albany road. The successful completion of such an arrangement would add very largely to the value of the stock.

Maine.

Atlantic and St. Lawrence Railroad.—The receipts of this road for the month of May, were:

For passengers.....\$6,945 70
For freight..... 4,525 45

\$11,471 10

Patent Self-clinching Railroad Spikes.

These spikes have been in use upon various roads for several years, and have met with universal approval by Engineers. They drive in the manner shown, turning themselves, and are therefore not liable to work loose. They will prove of great value to secure the chair.

We are also manufacturing railroad spikes, hook and flat head; wrought chairs, clamps, etc., of superior quality, and are prepared to contract for any pattern or weight upon favorable terms.

SMITH & TYSON,
25 South Charles st., Baltimore Md.

NORRIS' LOCOMOTIVE WORKS, SCHENECTADY, N. Y.

THESE Works are in full operation in Manufacturing to order, Locomotive Steam Engines & Tenders, of the best principle and construction of material, using wrought iron heavy frames with pedestals welded thereto, and all parts of the engine made of the best wrought iron, except cylinders, pumps and boxes—obtaining greater durability, and carrying less weight over the road, than engines constructed of cast iron.

Wrought Iron Tires made any required size, and the Bars bent and welded with dispatch.

Chilled Wheels for Cars, Trucks and Tenders, made from the toughest iron.

Driving and Tender and Car Wheels fitted to Axles with Brass Boxes and Springs, and Railroad Machinery generally. Manufactured and for sale by
April 11, 1849. E. S. NORRIS.

Ray's Patent India Rubber Car Springs.

Savannah, Ga., May 22, 1850.

FOWLER M. RAY, Esq.,

Dear Sir: I have no hesitation in saying, after having used on our road your springs and Fuller's, that I consider yours decidedly the best in every particular, and in this opinion I am sustained by all our officers. Fuller's spring has a tendency to split, and also to chafe or abrade by the constant friction on the cast iron plates or disc: and in my opinion is not near so elastic as yours.

Your springs, which have been in use on our road for 12 or 15 months past, and in constant use under both passenger and freight cars, are to all appearances as elastic, sound and good, as when first put in use.

We are now building eighty-five new cars, of which for fifty-sets the springs have been ordered of you.

GEORGE A. ADAMS,
Master Carpenter,
Central Railroad and Banking Co. of Georgia.

Connecticut River Railroad Office,
Northampton, May 4, 1850.

E. CRANE, Esq.,

Dear Sir: It is now about two years since I first tried the experiment of using a set of Ray's India-rubber Springs upon one of our merchandise cars, and although the car has been in constant service since that time, I do not on examination find the slightest difference either in the thickness or elasticity of the material.

The same result has followed wherever we have applied them, either for wheel or draw springs on Engines, Tenders or Cars. At present we use no other; either in replacing old springs or building new cars—and I am perfectly satisfied that for economy, durability, safety, and ease of motion, that Ray's India-rubber is the best article for Springs which has been presented to the public.

Yours respectfully, J. HUNT,
Supt. Connecticut River Railroad.

EDWARD CRANE, Esq.,

Dear Sir: Having applied to cars of the Boston and Worcester Railroad Corporation, Ray's Vulcanised Rubber Springs (where they have been in use for some two years last past), I have had occasion to observe their operation, and am free to say in answer to your inquiries, that they retain their elasticity perfectly during all changes of atmospheric temperature; and are in my opinion a most valuable acquisition to Railroad Cars—are not liable to derangement, as is the case with steel springs; while at the same time it costs less to apply them. Respectfully yours,

D. N. PICKERING,
Supt. Motive Power, Bos. & Wor. Railroad.
Boston, April 15th, 1850.

**NORTHERN RAILROAD, NEW YORK.**

CARS run between Rouses Point and Chateaugay daily, Sundays excepted, as follows:

Leave Rouses Point at . . . 3 1/2 A.M.
Leave Chateaugay at . . . 6 1/2 P.M.

On the arrival of the cars at Chateaugay, stages are in readiness to take the passengers to Ogdensburg, where they arrive the same day.

Passengers leave Ogdensburg in the morning by stage, and take the evening train from Chateaugay to Rouses Point, where they go immediately on board the steamboats which run north and south on Lake Champlain.

Passengers leaving New York in the evening by the way of Whitehall, will arrive at Rouses Point the next night, and the next morning pass directly from the boat to the cars, and arrive at Ogdensburg the same day.

CHARLES L. SCHLATTER, Supt.

Ibbotson, Brothers & Co's CELEBRATED CAST STEEL AND

Best Cast Steel Royal Improved Files, well known as better adapted for Engineers' and Machinists' purposes than any now in use in the United States.

Every description of Square, Octagon, Flat and Round Cast Steel, Sheet, Shovel and Railway Spring Steel, etc., and Steel to order for any purposes—manufactured at their works in Sheffield—and universally known by the old stamp "Globe."

HENRY J. IBBOTSON, Agent,
218 Pearl st., New York.

NOTICE.

A young man of experience in Surveying wishes a situation on a Railroad as an Assistant. Please apply at this office.

Election of an Engineer.

At a Meeting of the Board of Directors of the Virginia Central Railroad Co. at Charlottesville on the 4th day of June, 1850,

Resolved, That the election of a Chief Engineer in the place of Wm. A. Kuper, whose resignation has been accepted, is postponed to take place in Richmond on Tuesday the 18th of June instant.

A copy from the minutes.

JOHN GARRET, Secretary.

Lovegrove's Patent Cast Iron Water and Gas Pipes.

THE Subscriber, the Inventor and Patentee of the Centrifugal mode of giving form to metallic substances while in a molten state, is preparing to make Cast Iron Water and Gas Pipes, of any dimensions, at prices much lower than they can be made in the old manner, and the pipes warranted to stand a pressure of three hundred pounds to the square inch, and to be soft enough to drill. Steam Engines and all kinds of machinery. Cast Iron Doors and Frames, and Mill Castings of every description, made to order.

THOMAS LOVEGROVE,
Machinist and Founder,
West Falls Avenue, below Pratt st., Baltimore.

American Railway Guide, AND POCKET COMPANION FOR THE UNITED STATES;

CONTAINING Correct Tables, showing the time for starting of trains from all stations, distances, fares, etc., on all the Railway lines in the U. States; also many of the principal Steamboat and Stage routes—accompanied by a complete RAILWAY MAP. Price, single copies 12 1/2 cts., or \$1 per annum. Published on the first of every month, corrected from returns furnished by the Railway Superintendents throughout the Union.

This book has been compiled somewhat on the plan of Bradshaw's Guide, with such improvements in size, form and arrangement as have seemed desirable; and the publisher confidently hopes it will not be found liable to the objections of incompleteness and incorrectness, which have been made, and justly too, against various other similar works heretofore issued.

The subscriber having had the management of the NEW YORK PATHFINDER almost from its commencement, has enjoyed superior facilities in obtaining information relating to the thoroughfares of travel, and is therefore well qualified to prosecute with success the arduous undertaking of furnishing a complete and correct national guide book.

STRINGER & TOWNSEND, General Agents, 222 Broadway; and sold also by Booksellers and Periodical Dealers generally throughout the country; also on all the Railways and Steamboats.

CURRAN DINSMORE, Publisher.

N. Y. Pathfinder Office,
138 Fulton St., New York City.

India-rubber for Railroad Cos.

RUBBER SPRINGS—Bearing and Buffer—Fuller's Patent—Hose from 1 to 12 inches diameter. Suction Hose. Steam Packing—from 1-16 to 2 in. thick. Rubber and Gutta Percha Bands. These articles are all warranted to give satisfaction, made under Tyer & Helm's patent, issued January, 1849.—No lead used in the composition. Will stand much higher heat than that called "Goodyear's," and is in all respects better than any in use. Proprietors of railroads do not be overcharged by pretenders.

HORACE H. DAY,

Warehouse 23 Courtlandt street.

New York, May 21, 1849.

To Railroad Companies.

FOR SALE—A Second-hand Locomotive Engine and Tender, of about 10 tons weight, in good order, and warranted to perform well. Any company wanting a cheap engine for a passenger or light burden train, will rarely meet with an opportunity so favorable as the present. The engine and tender are in perfect running order, and will be tested to the satisfaction of any one wishing to purchase. Price \$1,500.

Address J. B. MOORHEAD,
Frazer P.O., Chester county, Pa.

P.S.—The Engine can be seen by calling on H. Osmond & Co., Car-builders, Broad st., Philadelphia. September 6, 1849.

Spikes, Spikes, Spikes.

ANY person wishing a simple and effective Spike Machine, or a number of them, may be supplied by addressing
J. W. FLACK,
Troy, N. Y.
March 8, 1850.

Great American Engineering

AND MECHANICAL WORK, just published in medium folio, 75 cts. to Subscribers, One Dollar to non-subscribers.

Part VI of "Specimens of the Stone, Iron and Timber Bridges, Viaducts, Tunnels, &c. &c. of the United States Railroads." By George Duggan, Architect and Civil Engineer.

The present part contains beautifully executed plans, elevations and sections of the Timber Bridge (three spans of 150, and one span of 160 feet) across the Delaware at Saw Mill Rift, on the line of the N. York & Erie R. R., with the specifications, estimates, bills of timber, iron, etc.

N.B.—With the present (6th) part, are given specimen Plates of the APPENDIX, (of "THEORETICAL AND PRACTICAL TREATISE ON BRIDGE BUILDING, etc. etc.") consisting of plans, elevations, sections and details of a cast iron oblique arch, 130 feet span, across Fairfield st. Manchester, on the line of the Manchester and Birmingham Railroad. Also a specimen sheet of the letter press of the APPENDIX, consisting of an introductory article on the Application of Iron to Railroad Structures.

"It is a work that was a great desideratum, and must prove of great benefit to the engineering profession generally, and especially to the tyro in practical engineering and mechanical knowledge; in truth it strikes us, that it would require years of labor and patient toil on the part of a young engineer to prepare the drawings, and collect the information that will be embodied in this work, and can now be secured for the trifling sum of \$9"—[Scientific Amer. March 16, 1850.]

In connection with this subject (Iron Railroad Structures) we take occasion to call attention again to Mr. Duggan's valuable and expensive publication, exhibiting drawings, with full descriptions of the various stone, iron and wooden bridges, viaducts, tunnels, culverts, etc., of all the Railroads in the United States. Mr. Duggan is an accomplished Architect and Civil Engineer, who came from Ireland to this country to exercise his profession; but finding railroad construction here, in many respects, different from that he had been accustomed to in Europe, he applied himself to the study of our system; and the fruits of his researches and investigations embodied in this work, are well calculated to meet the exigencies of engineers, and to assist draughtsmen, bridge builders, mechanics and students.—[N. Y. Journal of Commerce, Feb. 14, 1850.]

Published by **GEORGE DUGGAN**,
300 Broadway, New York.

To whom all communications should be addressed, and subscriptions forwarded.

RAILROAD CAR AND COACH TRIMMINGS.

Doremus & Nixon,
IMPORTERS AND FURNISHERS

HAVE FOR SALE

Plain Garnet Plush. Fig. Garnet Plush (Butterfly pat.
"Crimson " "Crimson " (Elegant.
"Scarlet " " " (Gen. Taylor.

BROCATELLES.

Crimson Silk Brocatelles. Gold and Maroon do.
Gold and Blue " " Brown "
Silk and Wool " of every color.

MOQUETTS,

Of elegant designs and colors.

GERMAN CLOTH FOR CAR LININGS.

The most beautiful goods ever shown in this country, and the subscribers are the sole agents for the sale of them.

Oil cloths Enamelled with Gold. These goods can be
" " Silver. furnished in any
Do. Silver ground velvet printed. dimensions req'd.

CURLED HAIR

Of every description and quality.

JNO. W. A. STRICKLAND, Agent.
New York, 1850. 1y16

Stickney & Beatty,
DEALERS IN IRON AND IRON MANUFACTURERS.

AGENTS for the Balt. City Rolling Mill, from which establishment they are prepared to furnish Elliptical's round, square, and flat bar iron, puddled and charcoal boiler plates and billet iron—also agents for the sale of the Laurel and Maryland (Balt.) charcoal forge pig irons, Balt. hard iron for chilling wheels, anti-rust nails, Catocin foundry iron, boiler blooms from the Caledonian works, Wm. Jessop & Son's cast steel, Coleman's blister steel and nail rods, hoop, band, sheet, oval and common English iron.

Nos. 18 and 20 South Charles st., Baltimore.

Fire Brick.

THE Subscribers have constantly on hand Rafford's Stourbridge, Oak Farms Stourbridge, Lister, Wortley, Red and White Welsh Fire Bricks, common and fancy shapes. Also,

ROOFING SLATES,

from the best Welch quarries, and of all sizes. Also,

COAL,

of all kinds—Liverpool Orrell and Cannel, Scotch, New Castle, Pictou, Sidney, Cumberland, Virginia, and all kinds of Anthracite coals. Also,

Pig Iron, Salt, etc., etc., for sale at the lowest market price. Apply to

SAMUEL THOMPSON & NEPHEW,
275 Pearl and 43 Gold Sts., New York.
November, 23, 1849.

FAIRBANKS' RAILROAD SCALES.—THE subscribers are prepared to construct at short notice, Railroad and Depot Scales, of any desired length and capacity. Their long experience as manufacturers—their improvements in the construction of the various modifications, having reference to strength, durability, retention of adjustment, accuracy of weight and dispatch in weighing—and the long and severe tests to which their scales have been subjected—combine to ensure for these scales the universal confidence of the public.

No other scales are so extensively used upon railroads, either in the United States or Great Britain;—and the managers refer with confidence to the following in the United States.

Eastern Railroad.	Boston & Maine Railroad.
Providence Railroad.	Providence and Wor. Road.
Western Railroad.	Concord Railroad.
Old Colony Railroad.	Fitchburg Railroad.
Schenectady Railroad.	Syracuse and Utica Road.
Balt. and Ohio Railroad.	Baltimore and Susq. Road.
Phila. & Reading Road.	Schuykill Valley Road.
Central (Ga.) Railroad.	Macon and Western Road.
	New York and Erie Railroad.

And other principal Railroads in the Western, Middle and Southern States.

E. & T. FAIRBANKS & CO.

St. Johnsbury, Vt.

Agents, } FAIRBANKS & Co., 89 Water St., N. York.
A. B. NORRIS, 196 Market St. Philadelphia.
April 22, 1849. 1y*17

STABILITY—SECURITY—PERPETUITY.
Mutual Life Insurance Co. of New York.

No. 35 WALL STREET.

A MILLION OF DOLLARS

Securely invested in Bonds and Mortgages on real estate in this city and Brooklyn, and stocks of the State and City of New York and United States Government.

The company declared a dividend of profits of fifty-two per cent. on all existing policies on the 31st of January, 1848.

All the Profits are Divided Among the Insured.

Persons may effect insurance on their own lives and the lives of others.

A married woman can insure the life of her husband, the benefits of which are secured by law for the exclusive use of herself or children.

Clergymen and all others dependent upon salaries or their daily earnings are specially invited to avail themselves of a resource whereby their surviving families may be secured from the evils of penury.

Pamphlets explanatory of the principles of Mutual Life Insurance, and illustrating its advantages, with forms of application, may be obtained at the office of the company, 35 Wall street, or of any of its agents.

TRUSTEES.

Jos. B. Collins,	Abraham Bininger,
Wm. J. Hyslop,	Alfred Edwards,
R. H. McCurdy,	Wm. Betts,
Fred. S. Winston,	Joseph Blunt,
C. W. Faber,	Isaac G. Pearson,
John P. Yelverton,	Henry Wells,
Theo. Sedgwick,	Wm. Moore,
Stacy B. Collins,	George R. Clark,
John H. Swift,	Jona. Miller,
John Wadsworth,	David A. Comstock,
S. M. Cornell,	Robert Schuyler,
Gouv. M. Wilkins,	James Chambers,
John V. L. Pruyn,	Joseph Tuckerman,
Jas. S. Wadsworth,	Moses H. Grinnell,
Charles Ely,	Wm. J. Banker,
John C. Cruger,	John M. Stuart,
Charles King,	Francis S. Lathrop,
Alfred Pell,	Nathaniel Hayden.

JOSEPH B. COLLINS, President.

ISAAC ABBATT, Secretary. 3m19

NOTICE TO**Superintendents of Railroads.**

TYLER'S PATENT SAFETY SWITCH.—The undersigned would respectfully call their attention to his Patent Safety Switch, which from long trial and late severe tests has proved itself perfectly reliable for the purpose for which it was intended. It is designed to prevent the train from running off when the switch is set to the wrong track by design or accident. The single rail or gate switch is established as the best and safest switch for the ordinary purpose of shifting cars from one track to another, but it is liable to the serious evil of having one track open or broken when connected with the other. My improvement entirely removes this evil, and while it accomplishes this important office, leaves the switch in its original simplicity and perfection of a plain unbroken rail, connecting one track with the other ready for use.

The following decision of the Commissioner of Patents is respectfully submitted to Railroad Engineers, Superintendents, and all others interested in the subject.
P. B. TYLER.

(COPY.)

UNITED STATES PATENT OFFICE,

Washington City, D.C., April 28th, 1846.

Sir: You are hereby informed that in the case of the interference between your claims and those of Gustavus A. Nicolls, for improvements in safety switches—upon which a hearing was appointed to take place on the 3d Monday in March, 1846, the question of priority of invention has been decided in your favor. Inclosed is a copy of the decision. The testimony in the case is now open to the inspection of those concerned.

Yours respectfully,
EDMUND BURKE,
Commissioner of Patents.

To Philo B. Tyler.

Any further information may be obtained by addressing P. B. TYLER, Springfield, Mass., or JOHN PENOLETON, Agent, 149 Hudson St., New York.

Coal.

CUMBERLAND SEMI-BITUMINOUS COAL
superior quality for Locomotives, for sale by
H. B. TEBBETTS,
No. 40 Wall St., New York.

May 12, 1849.

1m19

PHILADELPHIA CAR MANUFACTORY,

CORNER SCHUYLKILL 2D AND HAMILTON STS.,
SPRING GARDEN, PHILADELPHIA CO., PA.

Kimball & Gorton,

Having recently constructed the above works, are prepared to construct at short notice all kinds of

RAILROAD CARS, Viz:

Passenger Cars of all classes—Open and Covered Freight and Express Cars—Coal Cars—Hand Cars & Trucks of all descriptions.

They are also prepared to furnish Chilled Wheels of any pattern. Car Wheels & Axles fitted and furnished. Snow Ploughs and Tenders made to order. Steel and other Springs always on hand.

All orders will be filled at short notice, and upon as good terms as at any other establishment in the country.

Omnibuses from the Exchange run within one square of the manufactory every 10 minutes during the day.
Philadelphia, June 16, 1849. 1y25

C. W. Bentley & Co.,

IRON Founders, Portable Steam Engine Builders
and Boiler Makers, Corner Front and Plowman Sts., near Baltimore St. Bridge.

BALTIMORE, MARYLAND.

Their Engines are simple in their construction, compact and durable; they require no brick work in setting them, and occupy but a small space (a six horse power engine and boiler, standing on a cast iron plate of three by six feet.)

They also manufacture Major W. P. Williamson's new oscillating Engine; a superior article, combining cheapness and simplicity (one of which may be seen in operation at their shop.) Both of these engines are adapted to any purpose, where power is required, and may be made of any capacity; and for economy in use of fuel are unsurpassed.

All kinds of machinery made to order. Steam Generators, Force Pumps, Wrought Iron Pipes and Fittings for Steam, Water, Gas, etc., constantly on hand,
Baltimore, June 6, 1849.

CORROSIVE SUBLIMATE.

THIS article now extensively used for the preservation of timber, is manufactured and for sale by **POWERS & WEIGHTMAN**, manufacturing Chemists, Philadelphia.
Jan. 20, 1849.

ENGINEERS.**Atkinson, T. C.,**

Alexandria and Orange Railroad, Alexandria, Va.

Bancks, C. W.,

Civil Engineer, Vicksburg, Miss.

Berrien, John M.,

Michigan Central Railroad, Marshall, Mich.

Buckland, George,

Troy and Greenbush Railroad.

Clement, Wm. H.,

Little Miami Railroad, Cincinnati, Ohio.

Cozzens, W. H.,

Engineer and Surveyor, St. Louis, Mo.

Alfred W. Craven,

Chief Engineer Croton Aqueduct, New York.

Davidson, M. O.,

Eckhart Mines, Alleghany Co., Maryland.

Fisk, Charles B.,

Cumberland and Ohio Canal, Washington, D. C.

Felton, S. M.,

Fitchburgh Railroad, Boston, Mass.

Floyd-Jones, Charles,

South Oyster Bay, L. I.

Gzowski, Mr.,

St. Lawrence & Atlantic Railroad, Montreal, Canada.

Gilbert, Wm. B.,

Rutland and Burlington Railroad, Rutland, Vt.

Grant, James H.,

Nashville and Chattanooga R. R., Nashville, Tenn.

S. W. Hill,

Mining Engineer and Surveyor, Eagle River, Lake Superior.

Holcomb, F. P.

Southwestern Railroad, Macon, Ga.

Johnson, Edwin F.

New York and Boston Railroad, Middletown Ct.

Latrobe, B. H.,

Baltimore and Ohio Railroad, Baltimore, Md.

Miller, J. F.,

Worcester and Nashua Railroad, Worcester, Mass.

Morris, Elwood,

Schuylkill Navigation, Schuylkill Haven, Pa.

Morton, A. C.,

Atlantic and St. Lawrence Railroad, Portland, Me.

McRae, John,

South Carolina Railroad, Charleston, S. C.

Nott, Samuel,

Lawrence and Manchester Railroad, Boston.

Prichard, M. B.,

East Tennessee and Georgia R. R., Cleveland, Tenn.

Roebbling, John A.,

Trenton, N. J.

W. Milnor Roberts,

Pellefontaine and Indiana Railroad, Marion, Ohio.

Roberts, Solomon W.,

Ohio and Pennsylvania Railroad, Pittsburgh, Pa.

Sanford, C. O.,

South Side Railroad, Virginia.

Schlatter, Charles L.,

Northern Railroad (Ogdensburg), Malone, N. Y.

Sours, Peter,

Rahway, New Jersey.

Stark, George.,

Bost., Con. and Mont. R. R., Meredith Bridge, N. H.

Steele, J. Dutton,

Pottstown, Pa.

Trimble, Isaac R.,

Phila., Wil. & Baltimore Railroad, Wilmington, Del.

Tinkham, A. W.,

United States Fort, Bucksport, Me.

Thomson, J. Edgar.,

Pennsylvania (Central) Railroad, Philadelphia.

Troost, Lewis,

Alabama and Tennessee Railroad, Selma, Ala.

Whipple, S.,

Civil Engineer and Bridge Builder, Utica, N. Y.

Williams, E. P.,

Auburn and Schenectady Railroad, Auburn, N. Y.

Williams, Charles H.,

Milwaukee, Wisconsin.

HOTELS.**GUY'S****United States Hotel,**

(Opposite Pratt street Railroad Depot,) BALTIMORE.

JOHN GUY.

WILLIAM GUY.

American Hotel,

Pratt street, opposite the Railroad Depot, BALTIMORE.

HENRY M. SMITH.....Proprietor.
Late of the Exchange & St. Charles Hotels, Pittsburgh.**Washington Hotel,**

BY JOHN GILMAN,

\$1 Per Day.

No. 206 Pratt street, (near the Depot,) BALTIMORE.

Fountain Hotel,

LIGHT STREET, BALTIMORE,

P. THURSTON.....Proprietor.

Barnum's City Hotel,

MONUMENT SQUARE, BALTIMORE.

This Extensive Establishment, erected expressly for a Hotel, with every regard to comfort and convenience, is situated in the centre and most fashionable part of the city, and but a few minutes' walk from the Railroad Depots and Steamboat Landings.

The House has lately undergone a thorough repair, embracing many valuable improvements, and will accommodate 250 Guests. BARNUM & CO.

JONES' HOTEL,

NO. 152 CHESTNUT STREET, PHILADELPHIA.

BRIDGES & WEST, Proprietors.

DUNLAP'S HOTEL,

On the European Plan,

NO. 135 FULTON STREET,

Between Broadway and Nassau St., NEW YORK.

BUSINESS CARDS.**J. T. Hodge**

Will attend to the examination of mining tracts near Lake Superior, and prepare Reports and Maps.

Address, during the Summer,
Ontanagon Postoffice, Lake Superior.**Cumberland Steam Coal,**

FROM THE

FROSTBURG MINES, MD.

H. A. TUCKER,

Agent of Frostburg Coal Co.
No. 50 Wall Street, New York.**Eaton, Gilbert & Co.,**Railroad Car, Coach and Omnibus Builders,
TROY, N. Y.**Nathan Caswell,**

METAL BROKER, 69 WALL ST., N. Y.

For the Purchase and Sale of Railroad Iron (new and old,) Boiler Plates, Pig and Bar Iron, Lead, Tin, Copper, Spelter, etc. Refers to

Messrs. Boorman, Johnston, & Co., New York.

" Grinnell, Minturn & Co., "

" Barston, Pope & Co., "

" Earps & Brink, Philadelphia.

" E. Pratt & Brother, Baltimore.

John Barstow, Esq., Providence.

Lewis Bullard, Esq., Boston.

February 9, 1850.

6m*

United States Railroad Guide and Steamboat Journal.

CONTAINING OFFICIAL TIME ADVERTISEMENTS, Tables of Stations, Distances, Fares, Time, etc., with much miscellaneous matter for the travelling public. Price 12 cents a copy. Yearly subscription \$1. Published at 43 Ann street, New York.

J. & Riley Carr,

Manufacturers of Cast, Shear, German and Blister

STEEL,

Of all Descriptions, Warranted Good.

BAILEY-LANE WORKS, SHEFFIELD.

R. S. STENTON, Agent,

NO. 20 CLIFF ST., NEW YORK.

STEEL AND FILES.**R. S. Stenton,**

20 CLIFF STREET, NEW YORK,

AGENT FOR

J. & Riley Carr's

BAILEY-LANE WORKS, SHEFFIELD,

Manufacturers of Cast, Shear, German and Blister

STEEL

Of all descriptions. Warranted Good

FILES.

Manufacturers of Machinists' Warranted Best Cast Steel Files, expressly for working upon Iron and Steel, made very heavy for recutting.

A full Stock of Steel and Files at all times on hand. 6m4

Walter R. Johnson,

CIVIL AND MINING ENGINEER AND ATTORNEY for Patents. Office and Laboratory, F St., opposite the Patent office, Washington, D. C.

Dudley B. Fuller & Co.,

IRON COMMISSION MERCHANTS,

No. 139 GREENWICH STREET, NEW YORK.

Manning & Lee,

GENERAL COMMISSION MERCHANTS,

NO. 51 EXCHANGE PLACE, BALTIMORE.

Agents for Avalon Railroad Iron and Nail Works, Maryland Mining Company's Cumberland Coal (CED —Potomac) and other good brands of Pig Iron.

Cop Waste.

CLEAN COP WASTE, suitable for cleaning Railroad, Steamboat and Stationary Engines, constantly on hand and for sale by

KENNEDY & GELSTON,

54 Pine St., New York.

October 27, 1849,

3m

Ranstead, Dearborn & Co.,

MANUFACTURERS OF

LOCOMOTIVE CRANKS AND CAR AXLES,

ALSO

WROUGHT IRON SHAFTING,

And All Kinds of Hammered Shapes.

Forge at Commercial Point, Dorchester,

Office 25 Foster's Wharf, opposite No. 211 Broad St. BOSTON.

Henry J. Ibbotson,

IMPORTER of Sheffield and Birmingham Goods. Also, Agent for the Manufacture of Telegraph Wire. 218 PEARL ST., NEW YORK.

Cumberland, (Md.) Coals for Steaming, etc.

ORDERS RECEIVED FOR AND FILLED by J. COWLES, 27 Wall St., N. Y.

**Railroad Car Manufacturer's
Furnishing Store.****F. S. & S. A. MARTINE,**
IMPORTERS AND MANUFACTURERS OF**RAILROAD CAR &
CARRIAGE LININGS,**PLUSHS, CURTAIN MATERIALS, ETC.,
112 WILLIAM ST., NEAR JOHN.3-4 and 6-4 Damasks, Union and Worsted; Mo-
reens, Rattinets, Cloths, Silk and Cotton Velvets,
English Bunting**To Engineers and Surveyors.**E. BROWN AND SON Mathematical inst. mak-
ers No. 27 Fulton Slip, New York, make and keep
for sale, Theodolites, Levelling inst., Levelling rods,
Surveyors Compasses, and Chains, Cases of Mathe-
matical drawing insts. various qualities, together with
a general assortment of Ivory Scales and small insts.
generally used by Engineers.**Samuel Kimber & Co.,
COMMISSION MERCHANTS**

WILLOW ST. WHARVES, PHILADELPHIA.

AGENTS for the sale of Charcoal and Anthracite
Pig Iron, Hammered Railroad Car and Locomo-
tive Axles, Force Pumps of the most approved con-
struction for Railroad Water Stations and Hydraulic
Rams, etc., etc.

July, 27, 1849.

James Herron, Civil Engineer,OF THE UNITED STATES NAVY YARD,
PENSACOLA, FLORIDA,

PATENTEE OF THE

HERRON RAILWAY TRACK.Models of this Track, on the most improved plans,
may be seen at the Engineer's office of the New York
and Erie Railroad.**To Railroad Companies.****—WROUGHT IRON WHEELS—**

SAFETY AND ECONOMY.

**NORRIS' LOCOMOTIVE WORKS,
SCHENECTADY, NEW YORK,**Are Manufacturing Wrought Iron Driving, Truck,
Tender, and Car Wheels—made from the best Ameri-
can Iron. Address E. S. NORRIS.
May 16, 1849.**Machinery Warehouse.**S. C. HILLS, No. 43 Fulton street, New York, has
constantly for sale Steam Engines, Boilers, Lathes,
Chucks, Drills, Planers, Force and Suction Pumps;
Tenoning, Morticing and Boring Machines, Shingle
Machines, Bolt and Nut Machines, Belting, Oil, Iron
and Lead Pipe; Rubber, Percha and Leather Hose,
&c., &c.S. C. H.'s arrangements with several machine shops
are such that he can supply, at very short notice, large
quantities of machinery.

November 23, 1849.

**George O. Robertson,
BROKER IN SCOTCH AND
AMERICAN PIG IRON;**Bar Iron, Lead, Spelter, Tin, Copper, etc.,
No. 4 Liberty Place, MAIDEN LANE,
(Near Broadway.)
NEW YORK**Manufacture of Patent Wire
ROPE AND CABLES,**For Inclined Planes, Suspension Bridges, Standing
Rigging, Mines, Cranes, Derrick, Tillers, &c., by
JOHN A. ROEBLING, Civil Engineer,
TRENTON, N. J.**Samuel D. Willmott,**MERCHANT, AND MANUFACTURER OF
CAST STEEL WARRANTED SAWS,

—AND FILES—

IMPORTER OF THE
GENUINE WICKESLY GRINDSTONES
NO. 8 LIBERTY STREET,
NEW YORK.**Doremus & Harris,**ANALYTICAL & CONSULTING CHEMISTS,
179 BROADWAY, NEW YORK.

SCHOOL OF CHEMISTRY.

IRON.**Railroad Iron.**3,000 TONS C. L. MAKE 63½ lbs. per yard,
now landing and to arrive.Also contracts made for future delivery of above su-
perior make English Iron.

300 Tons Banks Best Iron, Round, Square and Flat.

200 " English Bar " " "

10 " 9-16 Square Iron for Railroad Spikes.

For sale in lots to suit purchasers by

DAVID W. WETMORE.

New York, March 26, 1850.

**SPRING STEEL FOR LOCOMOTIVES, TEN-
DERS AND CARS.**—The subscriber is engaged
in manufacturing spring steel from 1½ to 6 inches in
width, and of any thickness required: large quantities
are yearly furnished for railroad purposes, and where-
ever used its quality has been approved of. The estab-
lishment being large, can execute orders with great
promptitude, at reasonable prices, and the quality war-
ranted. Address J. F. WINSLOW, Agent,
Albany Iron and Nail Works.**Railroad Iron.**THE Undersigned, Agents for Manufacturers, are
prepared to contract to deliver Rails of superior
quality, and of any size or pattern, to any ports of dis-
charge in the United States.COLLINS, VOSE & CO.,
74 South St.

New York, June 1, 1850.

Railroad Iron.

1,500 Tons weighing 59 lbs. per lineal yard.

500 " " 57 " "

500 " " 56 " "

500 " " 60 & 61 lbs. "

Also 2½ x ½ flat rails. All the above being of approv-
ed patterns. For sale byDAVIS, BROOKS & CO.,
68 Broad street.N.B.—Rails imported on commission, or at a fixed
price.**Iron.**Pig Iron, Anthracite and Charcoal; Boiler and Flue
Iron, Spring and Blistered Steel, Nail Rods, Best Re-
fined Bar Iron, Railroad Iron, Car Axles, Nails, Stove
Castings, Cast Iron Pipes of all sizes, Railway Chairs
of approved patterns for sale byCOLEMAN, KELTON & CAMBELL,
109 N. Water St., Philadelphia.**IRONDALE PIG METAL, MANUFACTURED**and for sale by the Bloomsburg Railroad Iron Co.
LINDLEY FISHER, Treasurer,
75 N. Water St., Philadelphia.**Railroad Iron.**2000 Tons, weighing 58 pounds per lineal yard,
of the most approved pattern of T rails, in
store and to arrive, for sale byCOLLINS, VOSE & CO.,
74 South St.

New York, June 1, 1850.

Railroad Iron.1675 Tons, weighing about 61 lbs. per yard, 90
tons, weighing about 52 lbs. per yard, and
825 tons, weighing about 53½ lbs. per yard, of the lat-
est and most approved patterns of T rail, for sale byBOORMAN, JOHNSTON & CO.,
119 Greenwich street.

New York, Feb. 25, 1850.

N.B.—B. J. & Co are also prepared to take con-
tracts for English rails, delivered in any of the Atlan-
tic ports of the United States.**Railroad Iron.**THE UNDERSIGNED, HAVING made arrange-
ments abroad, are prepared to contract for the deliv-
ery of Foreign rails, of approved brands upon the
most favorable terms.They will also make contracts for American rails,
made at their Trenton works, from Andover Iron, in
whole or in part, as may be agreed upon.They are prepared to furnish Telegraph, Spring and
Market Wire; Braziers and Wire Rods; Rivets and
Merchant Bars to order, all made exclusively from An-
dover Iron. The attention of parties who require iron
of the very best quality for special purposes, is respect-
fully invited.COOPER & HEWITT,
17 Burling Slip, New York.

February 15, 1850.

Glendon Refined Iron.Round Iron, Band Iron, Hoop Iron.
Square " Flat " Scroll "

Axles, Locomotive Tyres.

Manufactured at the Glendon Mills, East Boston, for
sale by GEORGE GARDNER & CO.,

5 Liberty Square, Boston, Mass.

Sept. 15, 1849.

**PATENT HAMMERED RAILROAD, SHIP &
BOAT SPIKES.**—The Albany Iron Works
have always on hand, of their own manufacture, a
large assortment of Railroad, Ship and Boat Spikes
from 2 to 12 inches in length, and of any form of head
from the excellence of the material always used in
their manufacture, and their very general use for rail-
roads and other purposes in this country, the manu-
facturers have no hesitation in warranting them fully
equal to the best spikes in market, both as to quality
and appearance. All orders addressed to the subscrib-
ers at the works will be promptly executed.

JOHN F. WINSLOW, Agent.

Albany Iron and Nail Works, Troy, N. Y.

The above Spikes may be had at fair prices, of
Erastus Corning & Co Albany; Menitt & Co., New
York; E. Pratt & Brother, Es. Zanesville, Md**LAP—WELDED
WROUGHT IRON TUBES**

FOR

TUBULAR BOILERS,FROM ONE AND A QUARTER TO SEVEN
INCHES IN DIAMETER.THE ONLY Tubes of the same quality and man-
ufacture as those so extensively used in England,
Scotland, France and Germany, for Locomotive, Ma-
rine and other Steam Engine Boilers.THOMAS PROSSER & SON, Patentees,
28 Platt street, New York.**Railroad Iron.**THE UNDERSIGNED ARE PREPARED TO
contract for the delivery of English Railroad Iron
of favorite brands, during the Spring. They also re-
ceive orders for the importation of Pig, Bar, Sheet, etc.
Iron.

THOMAS B. SANDS & CO.,

22 South William street,
New York.

February 3, 1849.

Iron Store.THE Subscribers, having the selling agency of the
following named Rolling Mills, viz: Norristown,
Rough and Ready, Kensington, Triadelphia, Potts-
grove and Thorndale, can supply Railroad Companies,
Merchants and others, at the wholesale mill prices for
bars of all sizes, sheets cut to order as large as 58 in.
diameter; Railroad Iron, domestic and foreign; Locomo-
tive tire welded to given size; Chairs and Spikes;
Iron for shafting, locomotive and general machine;
purposes; Cast, Shear, Blister and Spring Steel; Bol-
ter rivets; Copper; Pig iron, etc., etc.

MORRIS, JONES & CO.,

Iron Merchants,

Schuylkill 7th and Market Sts., Philadelphia.
August 16, 1849.**Railroad Iron.**THE MOUNT SAVAGE IRON WORKS, AL-
legany county, Maryland, having recently pass-
ed into the hands of new proprietors, are now prepar-
ed, with increased facilities, to execute orders for any
of the various patterns of Railroad Iron. Communi-
cations addressed to either of the subscribers will have
prompt attention.

J. F. WINSLOW, President

Troy, N. Y.

ERASTUS CORNING, Albany

WARREN DELANO, Jr., N. Y.

JOHN M. FORBES, Boston.

ENOCH PRATT, Baltimore, Md.

November 6, 1848.

Railroad Iron.THE SUBSCRIBERS ARE PREPARED TO
take orders for Railroad Iron to be made at their
Phoenix Iron Works, situated on the Schuylkill Riv-
er, near this city, and at their Safe Harbor Iron Works,
situated in Lancaster County, on the Susquehanna
river; which two establishments are now turning out
upwards of 1800 tons of finished rails per month.Companies desirous of contracting will be promptly
supplied with rails of any required pattern, and of the
very best quality.

REEVES, BUCK & CO.

45 North Water St. Philadelphia.

March 15, 1849.

Monument Foundry.

A. & W. DENMEAD & SON,
Corner of North and Monument Sts.,—Baltimore,
HAVING THEIR

IRON FOUNDRY AND MACHINE SHOP

In complete operation, are prepared to execute faithfully and promptly, orders for
Locomotive or Stationary Steam Engines,
Woolen, Cotton, Flour, Rice, Sugar Grist, or Saw Mills,
Slide, Hand or Chuck Lathes,
Machinery for cutting all kinds of Gearing.
Hydraulic, Tobacco and other Presses,
Car and Locomotive patent Ring Wheels, warranted,
Bridge and Mill Castings of every description,
Gas and Water Pipes of all sizes, warranted,
Railroad Wheels with best faggotted axle, furnished and fitted up for use, complete

Being provided with Heavy Lathes for Boring and Turning Screws, Cylinders, etc., we can furnish them of any pitch, length or pattern.

Old Machinery Renewed or Repaired—And Estimates for Work in any part of the United States furnished at short notice.

June 8, 1849.

Iron Wire.

REFINED IRON WIRE OF ALL KINDS,
Card, Reed, Cotton-flyer, Annealed, Broom, Buckle, and Spring Wire. Also all kinds of Round, Flat or Oval Wire, best adapted to various machine purposes, annealed and tempered, straightened and cut any length, manufactured and sold by

ICHABOD WASHBURN.

Worcester, Mass., May 25, 1849.

American and Foreign Iron.

FOR SALE,

300 Tons A 1, Iron Dale Foundry Iron.
100 " 1, " " "
100 " 2, " " "
100 " " Forge " "
400 " Wilkesbarre " "
100 " "Roaring Run" Foundry Iron.
300 " Fort " "
50 " Catactin " "
25c " Chikiswalungo " "
50 " "Columbia" "chilling" iron, a very superior article for car wheels.
75 " "Columbia" refined boiler blooms.
30 " 1 x 1/2 Slit iron.
50 " Best Penna. boiler iron.
50 " "Puddled" " "
50 " Bagnall & Sons refined bar iron.
50 " Common bar iron.

Locomotive and other boiler iron furnished to order.

GOODHUE & CO.,

New York. 64 South street

American Pig, Bloom and Boiler Iron.

HENRY THOMPSON & SON,
No 57 South Gay St., Baltimore, Md.,
Offer for sale *Hot Blast Charcoal Pig Iron* made at the *Catoctin* (Maryland), and *Taylor* (Virginia), *Furnaces*; *Cold Blast* Charcoal Pig Iron from the *Cloverdale* and *Calamba*, Va., *Furnaces*, suitable for *Wheels* or *Machinery* requiring extra strength; also *Boiler* and *Flue* Iron from the mills of *Edge & Hilles* in Delaware, and best quality *Boiler Blooms* made from *Cold Blast Pig Iron* at the *Shenandoah Works*, Va. The productions of the above establishments can always be had at the lowest market prices, for approved paper.
American Pig Iron of other brands, and *Rolled* and *Hammered Bar Iron* furnished at lowest prices. Agents for *Watson's Perth Amboy Fire Bricks*, and *Rich & Cos.* New York *Salamander* Iron Chests.
Baltimore, June 14, 1849. 6 mos

Wheel, Forge and Foundry Iron.

LOCUST GROVE Wheel Iron of great strength and superior chilling property.
Balt. Charcoal Forge Iron, from Patuxent, Curtis Creek and Gunpowder furnaces.
Elkridge Foundry Iron, of superior strength and softness. Anthracite and Charcoal Iron from Pennsylvania and Virginia. Gas and Water Pipes, Lamp Posts from Elkridge furnace.

LEMMON & GLENN,

62 Buchanan's Wharf, Baltimore.

Iron.

THE SUBSCRIBERS having resumed the agency of the New-Jersey Iron Company, are prepared to execute orders for the different kinds and sizes of Iron usually made at the works of the company, and offer for sale on advantageous terms.—

150 tons No. 1 Boonton Foundry Pig Iron.
100 " No. 2 do. do. do.
300 " Nos. 2 & 3 Forge do. do.
100 " No. 2 Glendon do. do.
140 " Nos. 2 & 3 Lehigh Crane do do.
100 " No. 1 Pompton Charcoal do.
100 " New-Jersey Blooms
50 " New-Jersey Faggoting Iron, for shafts
Best Bars, 1/2 to 4 inch by 1/2 to 1 inch thick.
Do do Rounds and Squares, 1/2 to 3 inch.
Rounds and Squares, 3-16 to 1 inch.
Half Rounds, 1/2 to 1 in. Ovals & Half Ovals 1/2 to 1 1/2 in.
Bands, 1/2 to 4 inch. Hoops, 1/2 to 2 inch.
Trunk Hoops, 1/2 to 1 1/2 in. Horse Shoe & Nut Iron.
Nail Plates. Railroad Spikes.

DUDLEY B. FULLER & Co., 139 Greenwich-st. and 85 Broad-st.

WILLIAM JESSOP & SONS' CELEBRATED CAST-STEEL.

The subscribers have on hand, and are constantly receiving from their manufactory.

PARK WORKS, SHEFFIELD,

Double Refined Cast Steel—square, flat and octagon.
Best warranted Cast Steel—square, flat and octagon.
Best double and single Shear Steel—warranted.
Machinery Steel—round.

Best and 2d gy. Sheet Steel—for saws and other purposes.

German Steel—flat and square, "W. I. & S." "Eagle" and "Goat" stamps.

Genuine "Sykes," L Blister Steel.

Best English Blister Steel, etc., etc., etc.

All of which are offered for sale on the most favorable terms by **WM. JESSOP & SONS,**

91 John street, New York.

Also by their Agents—

Curtis & Hand, 47 Commerce street, Philadelphia.

Alex'r Fullerton & Co., 119 Milk street, Boston.

Stickney & Beatty, South Charles street, Baltimore.

May 6, 1849.

JOHNSON, CAMMELL & Co's Celebrated Cast Steel,

AND
ENGINEERING AND MACHINE FILES,
which for quality and adaptation to mechanical uses, have been proved superior to any in the United States. Every description of square, octagon, flat and round cast steel, sheet, shovel and railway spring steel, best double and single shear steel, German steel, flat and square, goat stamps, etc. Saw and file steel, and steel to order for any purposes, manufactured at their Cyclops Steel Works Sheffield.

JOHNSON, CAMMELL & CO.,
100 William St., New York.

November 23 1849.

Railroad Iron.

OF ANY PATTERN AND WEIGHT,
Of a Favorite Brand,
And deliverable in Bond, or Duty paid, at any Port of the U. S., contracted for on favorable terms, by
CHARLES ILLIUS,
20 Beaver St., New York.

Pig and other Iron also contracted for. Sole Agent for "*Baxter's Machine and Burning Oil*"—particularly adapted for "*Railroads*" and other Machinery—Preferred to Sperm by the many now using it, and 25 per cent. cheaper.

CUT NAILS OF BEST QUALITY, BAR IRON
(including Flat Rails) manufactured and for sale by
FISHER, MORGAN & CO.,
75 N. Water St., Philadelphia.

Ogden & Martin's ROSENDALE CEMENT.

WE are prepared to enter into arrangements for supplying our Cement for public works or other purposes. We warrant the cement equal in every respect to any manufactured in this country. It attains a great degree of hardness, sets immediately under water, and is a superior article for masonry coming in contact with water, or requiring great strength.

For sale in tight barrels, well papered, at their office by
OGDEN & MARTIN, 104 Wall st.
February 16, 1850. ly*

The above cement is used in most of the fortifications building by government.

To Steam Engine Builders.

THE Undersigned offer for sale, at less than half its cost, the following new machinery, calculated for an engine of 62 inches cylinder and 10 feet stroke, viz.

- 2 Wrought Iron Cranks, 60 inches from centre to centre.
- 1 Do. do. Connecting Rod Strap.
- 2 Do. do. Crank Pins.
- 1 Eccentric Strap.
- 1 Diagonal Link with Brasses.
- 1 Cast Iron Lever Beam (forked).

The above machinery was made at the West Point Foundry for the U. S. Steamer Missouri, without regard to expense, is all finished complete for putting together, and has never been used. Drawings of the cranks can be seen on application to

HENRY THOMPSON & SON,
No. 57 South Gay St., Baltimore, Md.

Sept. 12, 1849.

8,000 Tons Railroad Iron.

THE OHIO AND PENNSYLVANIA RAILROAD CO. wish to contract for eight thousand tons of Railroad Iron, for the eastern division of their road, extending westward from Pittsburgh. Three thousand tons to be delivered on the Ohio river at Pittsburgh and Beaver, before the close of canal navigation in the present year, 1850; and the remainder in the spring of next year. The rails are to be of the H pattern, in lengths of 20 feet, and are to weigh 60 lbs. per lineal yard. They are to be subject to the inspection of Solomon W. Roberts, Chief Engineer.—For further particulars address the President of the Company at Pittsburgh.

By order of the Board of Directors.

WM. ROBINSON, Jr., President.

S. S. Keyser & Co., IRON WAREHOUSE,

Corner of South and Pratt Streets,
BALTIMORE, MD.

Selling Agents for the Rough and Ready Bar Iron and Elk Boiler and Flue Iron Rolling Mills, Sarah and Taylor Furnaces, and Wrightsville Hollow Ware Foundry, and Dealers in Bar and Sheet Iron, and Cast, Sheer, German, Blister, Spring and Electrodesed Steel, etc., etc.

Smith & Tyson,

GENERAL COMMISSION MERCHANTS,
No. 25 South Charles St., Baltimore, Md.

AGENTS for the Celebrated Columbia Pig Iron, suitable for Car Wheels and Chilled Rolls.
Columbia refined Charcoal Blooms; Refined Charcoal Juniata Billet Iron for Wire; Refined Iron for Bridging, of great strength; Cut Nails, Spikes, and Brads; Railroad Spikes and Wrought Chairs. 22tf

To Railroad Companies and Contractors.

FOR SALE.—Two Locomotive Engines and Tenders, at present in use on the Beaver Meadow Railroad, being too light for their coal trains, but well calculated for either gravel or light passenger trains.

They weigh, in running order, about 8 tons each—having one pair of driving wheels 4 feet diameter, 4 truck wheels 30 inches diameter, with cylinders 10 in. diameter, and 18 inches stroke of piston. Tenders on 4 wheels. Address **JAMES ROWLAND,**

Pres't. Beaver Meadow Railroad & Coal Co., Philadelphia.

or, **L. CHAMBERLAIN, Sec'y,**
at Beaver Meadow, Pa.

May 19, 1849. 20tf

Railroad Instruments.

THEODOLITES, TRANSIT COMPASSES,
and Levels, with Fraunhoffer's Munich Glasses, Surveyor's Compasses, Chains, Drawing Instruments, Barometers, etc., all of the best quality and workmanship, for sale at unusually low prices, by
E. & G. W. BLUNT,

No. 179 Water St., cor. Burling Slip.
New York, May 19, 1849.

Rosendale Cement.

THE NEWARK AND ROSENDALE LIME AND CEMENT CO. are now manufacturing at their works in NEWARK, N. J., and Ulster county, N. Y., a very superior article of *Hydraulic Cement*—also Lime Calcine Plaster, etc. Contractors and dealers will find it to their advantage to call or make application before purchasing elsewhere. All communications addressed to the subscriber, at Newark, N. J., will be punctually attended to.

ly*15 **HENRY WILDE, Secretary.**

Patent India Rubber Steam Packing.

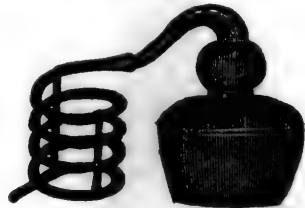
THIS article, made by the subscriber, who alone is authorised to make it, is warranted to stand as high a degree of heat as any that has been or can be made by any person—and is the article which has made the reputation of India Rubber Steam Packing and the demand therefor. A large assortment of all thick nesses requisite for any description of engines, steam pipes, valves, etc., constantly on hand and for sale by the manufacturer and patentee, who will give every information regarding its properties, mode of use, etc. at the warehouse. JOHN GREACHEN, JR., 98 Broadway, opposite Trinity Church. New York, October, 1849.

Passenger Car Linings.

THE Advertiser continues to make to order the Enamelled Car Linings which have been so highly approved the last three years, and are now exclusively used by all the Northern Railroads. No pains are spared to get out new styles, and adapt them to the tastes of every consumer. Orders addressed to CHARLES STODDER, No. 75 Kilby street, Boston, will have prompt attention. March 23, 1850. 2m

CAUTION.

RAILROAD COMPANIES and others are hereby cautioned against using or vending our improvement for easing the lateral motion as applied on Railroad Cars. Letters Patent having been granted to us in 1841, any party or parties so making or using said improvement without license from us will be proceeded against according to law. DAVENPORT & BRIDGES.



P. H. Griffin,

Corner of Steuben and James Sts. Albany, N.Y. CONTINUES to manufacture copper flues for locomotive boilers, brewers' coppers, stills, tanner heaters, etc. Copper work in general, at the shortest notice. He has constantly on hand brass cocks, brass valves, copper pumps of every variety. Orders promptly attended to. 1yl4

FOWLER M. RAY'S Patent India-rubber Railroad CAR SPRING.

New York and Erie Railroad Shops. Piermont, March 26, 1850.

This will certify that from practical experience in the use of Fowler M. Ray's India rubber Car Springs, I believe them to be far superior to any others now in use.

I have never known them to be affected by any change of temperature, as other Rubber Springs have been affected on this road.

I am at the present time repairing a Passenger Car that Mr. Ray and myself mounted with his springs about two years and eight months since.

The springs are at the present time as perfect, to all appearances, as when first applied to the car.

Respectfully yours,

HORACE B. GARDNER, Foreman of the Car Shops.

Supt. Office N.Y. & H. R.R., } New York, March 8, 1850.

This is to certify that we have used the Rubber Springs manufactured by Mr. F. M. Ray for the past twenty months, "both for Passenger and Freight Car Springs and Bumpers, and of different sizes," and have in every case given entire satisfaction, and I consider them the best spring now in use.

M. SLOAT, Supt.

Harlem R.R. Depot, } New York, March 7, 1850.

This is to certify that we have used Mr. F. M. Ray's India-rubber Springs for over eighteen months, and find them to be easy and durable, and recommend them to railroad companies as being superior to anything we have tried.

J. M. SMART, Foreman at 42d St. Depot.

Office New Jersey Railroad Co., } Jersey City, March 8, 1850.

FOWLER M. RAY, Esq.,

Dear Sir: In answer to your enquiries respecting the operation of the Vulcanised Rubber Springs, purchased by our company from you some two years since, I reply that they are superior to any spring in use, (that I have either seen or heard of).

The improved form of your spring, consisting of a solid piece of vulcanised rubber with bands on the outside, is far superior to your first form, consisting of disks of rubber with metallic plates interposed.

The last named form was tried, if you recollect, at a much earlier period; and then was replaced by your last form.

I have no hesitation in saying that your springs have given entire satisfaction, and most cheerfully recommend them to railroad companies throughout the country for the following reasons:

- 1st. The cost is 30 per cent. less.
- 2d. Saving of weight on each car of 8 wheels from 700 to 800 lbs.
- 3d. Less care and attention is required, as they are not liable to get out of repair.
- 4th. A great saving is secured in the wear and tear of the cars and rails from their great elasticity.
- 5th. The freedom from noise.
- 6th. There is greater safety in case of accident, as they cannot be broken.
- 7th. The comfort of passengers is enhanced sufficiently to pay the expense, waiving all the other reasons that I have given.

Should this fail to satisfy any person enquiring, you are at liberty to refer to me, No. 150 Washington St., Jersey City. Yours respectfully,

T. L. SMITH, Supt.

New York, March 11, 1850.

I have used the Patent India-rubber Spring purchased of Mr. Ray, upon the cars of the New York and New Haven Railroad, and have found them efficient and economical; and when applied to the axles and draw springs, believe them to be quite equal to any in use. I have found a combination of these springs with a steel spring under the transom beam a very satisfactory arrangement, and am now using this plan in all new cars.

Yours respectfully,

ROBERT SCHUYLER.

February 25, 1850.

From practical observation of the use of the India-rubber Car Springs, manufactured and sold by your company, we are entirely satisfied in their application, and do not hesitate to recommend them as elastic, durable, requiring no repairs for years, and retaining their consistency during all extremes of weather. We have applied them for the past two years, and consider them superior for all railroad purposes.

Yours truly,

OSGOOD BRADLEY, Car Builder, Worcester.
T. & C. WASON, do. Springfield.
DEAN PACKARD & MILLS, do. do.
DAVENPORT & BRIDGES, do. Cambridgeport.

Office of the New Jersey Railroad Co., } Jersey City, March 7, 1850.

This is to certify that we have had Mr. F. M. Ray's India-rubber Springs in constant use under our cars, and as Bumper Springs for upwards of two years, and they have in every way given perfect satisfaction.

The present form of spring we deem far superior to the form of Disk, having used both forms, although we have none of those made in Disks at present in use.

We take pleasure in recommending these springs to all railroad companies.

J. P. JACKSON, Vice Pres.
New Jersey Railroad and Trans. Co.

Roxbury, February 28, 1850.

In compliance with your request, I take great pleasure in stating the result of my experience in the use of "Ray's Patented Vulcanised India-rubber Car and Engine Springs." We have used them nearly two years, and never had one fail in any way. The cold weather does not affect them, as it has other rubber springs we have used.

With sixteen years' experience as superintendent of machinery on the Boston and Providence railroad, I take pleasure in saying that your springs are the best we ever used, or I ever saw used elsewhere. We have 20 cars rigged with them, of which I can say that the springs are as good now as when first applied. I put 24 lbs. of the rubber under the forward end of one of our heaviest engines, taking off 250 lbs. of steel springs—it has been in use 18 months, and is in as good condition now as when first put under the engine.

Very respectfully yours,

GEO. S. GRIGGS, Supt. of Machinery, Boston and Prov. R.R.

Fall River, February 2, 1850.

In answer to yours of the 20th ult. I would say that this company has for some 10 or 12 months past been using "Ray's India-rubber Springs." We have applied them to both passenger and freight cars with uniform success. They have invariably preserved their elasticity and consistency through all the extremes of weather; and we are now applying them whenever the steel spring fails. I am well satisfied that they are particularly adapted for railroad purposes.

Very respectfully yours,

GEO. HAVEN, Supt. Fall River Railroad.

Jersey City, March 9, 1850.

This is to certify that the present form of Mr. F. M. Ray's India-rubber Car Spring I consider far superior to the form of Disk, having used both forms.

I take pleasure in recommending these springs to all railroad companies. DAVID H. BAKER, Foreman of Car Shop of N.J. R.R. & Trans. Co.

Boston, March 5, 1850.

In answer to your enquiry about India-rubber Springs, I have to say that we have used them to a considerable extent on both freight and passenger cars, and also on several of our tenders; and I am very well satisfied that they answer all the purposes for which they are intended. I believe the India-rubber will soon supersede all other springs for cars and tenders.

Yours truly,

S. M. FELTON, Supt. Fitchburg Railroad.

Old Colony Railroad Office, Boston, March 6, 1850.

EDWARD CRANE, Esq.,

President New England Car Co.,

Dear Sir: In compliance with your request I would state that the Old Colony Railroad Company have had in use upon their road, India-rubber Springs furnished by your company, for more than eighteen months past, during which time they have been extensively used under Passenger and Freight Cars, Locomotive Tenders, and for Drawer and Bumping Springs, with the most perfect success. The elasticity and consistency of the Rubber has never been unfavorably affected by either extremes of heat or cold—and from the experience which we have had in the use of Rubber Springs, I think them well adapted for railroad purposes—and therefore we have for some months past used Rubber almost exclusively, in all places where springs are required.

Respectfully yours, etc.,

JAS. H. MOORE, Supt. O. C. Road.

Troy, February 27, 1850.

We have been using your India-rubber Car Springs for nearly two years—and we take pleasure in saying that in our opinion the rubber has to a certain extent already, and may eventually entirely supersede all other Springs for Railroad Car purposes. We now use it entirely for Draw Springs and Bumpers, considering it better and lighter than steel.

During our two years' experience in the use of it, we have not known any to lose their elasticity, or fail in any way; and we cheerfully recommend the rubber for railroad car springs. Very respectfully,

EATON, GILBERT & CO.

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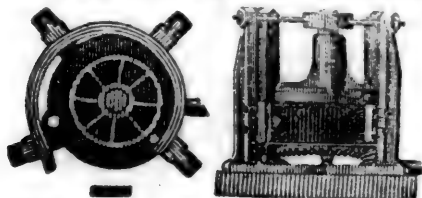
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NEW YORK.

And in the principal cities and towns in the U. States. The Premium of the AMERICAN INSTITUTE was awarded to the Etna Safety Fuse at the late Fair held in this city.

November 3, 1849.

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MACHINERY.**Henry Burden's Patent Revolving Shingling Machine.**

THE Subscriber having recently purchased the right of this machine for the United States, now offers to make transfers of the right to run said machine, or sell to those who may be desirous to purchase the right for one or more of the States.

This machine is now in successful operation in ten or twelve iron works in and about the vicinity of Pittsburgh, also at Phoenixville and Reading, Pa., Covington Iron Works, Md., Troy Rolling Mills, and Troy Iron and Nail Factory, Troy, N. Y., where it has given universal satisfaction.

Its advantages over the ordinary Forge Hammer are numerous: considerable saving in first cost; saving in power; the entire saving of shingler's, or hammerman's wages, as no attendance whatever is necessary, it being entirely self-acting; saving in time from the quantity of work done, as one machine is capable of working the iron from sixty puddling furnaces; saving of waste, as nothing but the scoria is thrown off, and that most effectually; saving of staffs, as none are used or required. The time required to furnish a bloom being only about six seconds, the scoria has no time to set, consequently is got rid of much easier than when allowed to congeal as under the hammer. The iron being discharged from the machine so hot, rolls better and is much easier on the rollers and machinery. The bars roll sounder, and are much better finished. The subscriber feels confident that persons who will examine for themselves the machinery in operation, will find it possesses more advantages than have been enumerated. For further particulars address the subscriber at Troy, N. Y.

P. A. BURDEN.

Railroad Spikes and Wrought Iron Fastenings.

THE TROY IRON AND NAIL FACTORY, exclusive owner of all Henry Burden's Patented Machinery for making Spikes, have facilities for manufacturing large quantities upon short notice, and of a quality unsurpassed.

Wrought Iron Chairs, Clamps, Keys and Bolts for Railroad fastenings, also made to order. A full assortment of Ship and Boat Spikes always on hand.

All orders addressed to the Agent at the Factory will receive immediate attention.

P. A. BURDEN, Agent,
Troy Iron and Nail Factory, Troy, N. Y.

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CHILLED RAILROAD WHEELS.—THE Undersigned are now prepared to manufacture their Improved Corrugated Car Wheels, or Wheels with any form of spokes or discs, by a new process which prevents all strain on the metal, such as is produced in all other chilled wheels, by the manner of casting and cooling. By this new method of manufacture, the hubs of all kinds of wheels may be made whole—that is, without dividing them into sections—thus rendering the expense of banding unnecessary; and the wheels subjected to this process will be much stronger than those of the same size and weight, when made in the ordinary way.

A. WHITNEY & SON,
Willow St., below 13th,
Philadelphia, Pa.

CHILLED RAILROAD WHEELS.—THE Undersigned, the Original Inventor of the Plate Wheel with solid hub, is prepared to execute all orders for the same, promptly and faithfully, and solicits a share of the patronage for those kind of wheels which are now so much preferred, and which he originally produced after a large expenditure of time and money.

A. TIERS,
Point Pleasant Foundry.

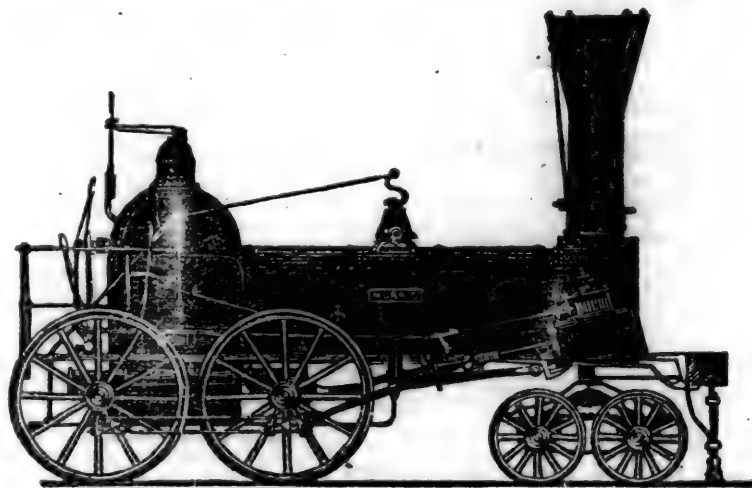
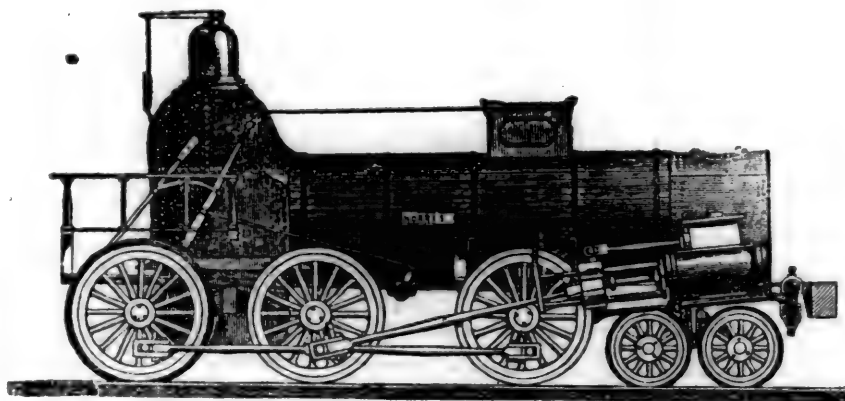
He also offers to furnish Rolling Mill Castings, and other Mill Gearing, with promptness, having, he believes, the largest stock of such patterns to be found in the country.

Kensington, Philadelphia Co.,
March 12, 1848.

A. T.

NORRIS' LOCOMOTIVE WORKS.

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Connected with the Locomotive business, they are also prepared to furnish, at short notice, Chilled Wheels for Cars of superior quality.

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Iron and Brass castings, Axles, etc., fitted up complete with Trucks or otherwise.

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142 Front-street, New York.

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The Troy Iron and Nail Factory have always on hand a general assortment of Horse Shoes, made from Refined American Iron.

Four sizes being made, it will be well for those ordering to remember that the size of the shoe increases as the numbers—No. 1 being the smallest.

P. A. BURDEN, Agent,
Troy Iron and Nail Factory, Troy, N. Y.

COLUMBUS, OHIO,**Railroad Car Manufactory. RIDGWAYS & KIMBALL,**

HAVE established at this central point, the manufacture of Passenger, Freight, Gravel and Hand Cars for Railroads, and assure all Western Railroad Companies that it will be their constant aim to procure the best materials and workmen, and to turn out the best kind of work at fair prices. Specimens may be seen on the Columbus and Xenia Railroad. The patronage of Railroad Companies is respectfully solicited.

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To Inventors and Patentees.

OWEN G WARREN, ARCHITECT, Has had many years' experience as Agent for obtaining Patents, both in this country and Europe, and will transact such business promptly and reasonably. Persons at a distance can have their business done by correspondence—without the necessity of visiting this city or Washington. Office No. 94 Merchants Exchange, Wall st., corner of Hanover st., up stairs.

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AMERICAN RAILROAD JOURNAL.

STEAM NAVIGATION, COMMERCE, MINING, MANUFACTURES.

HENRY V. POOR, Editor.

ESTABLISHED 1831.

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SATURDAY, JULY 13, 1850.

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ASSISTANT EDITORS,

J. T. HODGE, *For Mining and Metallurgy.*
GEN. CHAS. T. JAMES, *For Manufactures and the
Mechanic Arts.*

M. BUTT HEWSON, C. E., *For Civil Engineering.*

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American Railroad Journal.

PUBLISHED BY J. H. SCHULTZ & Co., 136 NASSAU ST.

Saturday, July 13, 1850.

Mouth of the Ontonagon, June 30, 1850.

My communications to the Journal relative to the Copper Mines of Lake Superior have been delayed since my arrival at this place on the 27th of May, by my attention having been directed to one point only. Without having visited any of the principal mines, except the Minesota, and this but once for a cursory examination, I have not provided myself with such results of personal observation, as seemed to me of sufficient importance to present to the readers of the Journal.

A tedious detention at this place, waiting the arrival of a boat and mail, affords me an opportunity of writing, of which I will avail myself to jot down some general remarks upon the present condition and prospects of this region.

And first as to the increased facilities of communication with the country below, which I have before alluded to, as in preparation for the operations of this season. Early in the month of May the fine steamer London, elegantly fitted up with the best

accommodations of the lake steamers, commenced running on the route from Detroit to Sault Ste. Marie. Most unfortunately for her enterprising owners and for the comfort of early travellers, she was driven ashore by a field of floating ice in Lake George, twenty or thirty miles below the Sault, and several weeks were lost before she could again be got afloat. We passed her on our way up, and had an opportunity of going on board, and admiring her excellent outfit, and the spacious dimensions of her cabins and state rooms—a poor satisfaction to us, who had been crowded with a large number of surveyors and other passengers for four days in bad weather into the contracted cabin of the propeller Montezuma—a condition we should have pronounced decidedly insufferable, but for the patience, politeness and gentlemanly conduct of Capt. Gibson, the commander of the boat.

On the upper lake the favorite boat Napoleon, and the staunch copper-carrier Independence, both propellers, commenced their regular trips quite as early as was compatible with their safety; the latter indeed in her first trip up encountering so severe a storm, that several cattle were drowned on her decks, and a part of her deck load was necessarily thrown over. At the same time the large propeller Manhattan, well fitted up as a passenger boat, and belonging to an opposition company to that which controls the other boats, was on her way over the portage at the Sault. Raised out of the water upon "ways," well greased, she was drawn along by two capstans, turned by one horse each, at the rate of from two to three hundred feet each day. About two weeks since she regained her proper element, to float hereafter on as high a level above the sea as any vessels of her size probably ever reach. She has already made one trip up the lake, and is hourly expected again; but to the disappointment of all she failed in her attempt to come over the bar of this river, in which from her light draught it seemed likely she would succeed.—Until therefore assistance is obtained from the general government for the construction of piers at this point, there is no prospect of the Ontonagon becoming the important harbor for this region, which by Nature it was evidently designed to be, when man should add his exertions to complete the work.

With the boats already on this lake and those below, the copper country is at last well provided with the means of communication during the summer with the lower country, and of a ready transporta-

tion of its products. Were the arrangements for the transportation of the mails as well provided for as for that of freight, and rigidly adhered to, residents in this upper country would have much more cause for satisfaction. But it becomes more vexatious and disheartening on the arrival of a boat to be told that the mail was twice forgotten at Detroit and left there, and by another that the captain would not wait for it on leaving the Sault, or that the postmaster would not get it ready in time, and so it laid over a week there. These matters are of serious consequence to the companies, whose business supports these boats, and must tend in some degree to retard the progress of their operations and consequently the patronage of the boats. The latest advices we have from New York are to the 5th June. I doubt whether the far off Californians are not as well posted up in news as we of this comparatively central point—central as it seems to us, for are we not a part of the great State of Michigan, with the State of Wisconsin on our southern and western border separating us in the latter direction from the territory of Minnesota? The lines of the copper region are State-lines, and the nearest territory to it is soon to be received into the Union as a great and important State. And yet with all the modern improvements of steam on land and water, and of telegraphs, we are a month behind the rest of the world. We know not what has passed in this time among our nearest neighbors, and have barely heard of the invasion of Cuba and the deserved repulse and castigation those of our restless countrymen met who joined in the attack upon Cardenas. The very soil we are now upon may have been proclaimed for sale by Congress, and the new bill proposed by the Committee on Public Lands in the Senate become a law, and we sit here in quiet ignorance of that, which when announced will create no little stir among all the inhabitants hereabouts, and lead to the adjustment and settlement of many important claims, some valid and some worthless.

And now having given a little consideration to the means provided for reaching this country, let us regard its appearance for a moment as it presents itself on the arrival of a traveller in the latter part of the month of May—this month when Nature below has put aside its wintry dress, and is smiling in the bright promise of blooming orchards and gaily decorated gardens. Here it is the beginning of the opening of navigation. The ice still

floats in cakes down the streams, and in places protected from the rays of the sun it lies in huge masses slowly wasting from day to day. The snow hangs in banks along the shores of the lake, and is found even into the month of June in spots through the woods. The wild flowering plants, which all winter have been kept well protected from the frosts beneath this non-conducting covering, spring rapidly up as soon as they feel the first rays of the sun; and the woods are all at once blooming with the modest little epigeia-repens or mayflower or trailing arbutus, which in the sandy woods of New Jersey and southeastern part of Massachusetts had been the harbinger of spring a month earlier.—With this beautiful little flower come varieties of trillia and violets and anemones much like the productions of our eastern woods. But the note of birds is silent here, for few are found in this wild region, and (excepting insects) animal life generally in these woods is represented by few species, especially of those regarded as game. As the spring advances the days rapidly lengthen, and the whole vegetable kingdom quickened by the action of the sun's rays for seventeen hours out of the twenty four soon attains the same degree of forwardness with the growth of other places, whose start was several weeks earlier. The foliage is put forth almost at once, and one is every day surprised at the rapidity with which the openness of the woods is closed up, and the view obscured. In the month of June the land in the few clearings is prepared for planting, the potatoes, oats, grass seed and garden vegetables are put in the ground, but the planting of turnips and ruta-bagas, which are here one of the principal crops, is deferred until July, these roots being mostly allowed to remain all winter in the ground, protected by the snow, before they are gathered. The potatoes also keep very well in the same way, and are frequently dug from under the snow as they are wanted. These crops grow with great luxuriance on the new soil of this region, particularly along the trap ridge, where the mines are situated; and so valuable are they, and the market so certain and so near, that those who engage in farming make a better business of it than is often the experience of agriculturists in much more favored climes. There are, however, few farmers here, not a quarter enough to supply the wants of the country. The mining companies themselves are obliged to till the soil as well as gather their crops beneath it; and they would be glad to give up this branch, and sufficient land too, to those who would make it their whole business. But it is the insects before alluded to, that most interfere with agricultural operations, and discourage men from undertaking to clear and cultivate the lands. These are the various kinds of flies common in the spring and early part of the summer all along our northern wild lands. The first that come are the common black flies—half as large as a house fly. They seem to rise out with the first flowers from under the snow, and in still weather, or at all times under the shelter of the woods, surround their poor victims like swarms of bees, attacking incessantly the hands and face, biting particularly the wrists under cover of the wristband, and the ears, and behind them under the edge of the hair, and round the neck, till the parts become severely sore and swollen, sometimes so much so that the cavities of the eye are covered over by the swollen flesh. Soon their forces are joined by the mosquitos, which keep up their attacks all night long as well as all day, and in certain favorite spots far exceed in number the dense swarms of the black

fly. The mosquitos have not been long at work, before one is surprised occasionally by a new sort of bite, a sharp prickling sensation, burning like fire, but without any visible agent to produce it. A repetition of the pain, however, makes the eye more watchful, and the two almost invisible wings of a very minute fly are discovered standing on end, as the head of the little rascal is turned down into the pores of the skin. These torments are called midges, or by the Indians in Maine, very appropriately, "no-see-ums." They work, too, night and day, and encounter no serious obstacle in the meshes of a mosquito net. Next appears a fly similar to the common horse fly, which, as horses are not very plenty, seems driven to attack the human race—below generally treated by them with more respect—their bite is sharp, but not so often repeated as of the others. With them comes a yellow buzzing fly, which I have mistaken for the stinging "yellow jacket," whose appearance is later in the season. This fly hangs buzzing in the air in one spot directly before the face, and if frightened suddenly takes another position before it lights to take its meal. The bite of this fly is like that of a leech, but as the attack is not made by battalions it can be generally guarded against. The last of these pests is the great clumsy "moose fly," as he is called in Maine, much larger than the "deer fly," which I have not seen here. From his size he seldom gets a chance to bring his apparatus to bear upon the human person, and the pump never performs more than the first stroke before the whole machinery is knocked into utter destruction. But in connection with the two preceding species this fly is very severe in its attacks upon cattle and horses. Now is the season in which these nuisances have almost full sway through the woods. It is no time for exploration, nor for travelling with any comfort; and I have been thus stationary, with the more satisfaction, knowing that during August and afterwards one can go from place to place with little annoyance of this kind. But after all the winter, so all say who have spent one here, cold as it is, is the season of the year for most enjoyment, and for travelling through the woods with the greatest ease. The foliage is then fallen from all the deciduous trees, and the underbrush is bent down and covered by the snow. Upon this one travels comfortably with snow shoes, and supplies are carried where wheels could not go in the summer. Much transportation is conducted by means of dogs, or what are called dog trains. At the Forest mine, up this river, is a fine pair of dogs, which the last winter were occupied a good part of the season carrying supplies to the mine. They would draw with ease a barrel of pork at a load, weighing 200 lbs, beside the brine and barrel, and would keep at work all day with untiring spirit.—One is a Newfoundland the other a Mastiff, eleven years old. In the summer they are inactive and worthless; but in the winter full of life and apparently much enjoying their usefulness. On the train, which is a mere board, turned up at the end, a man can ride very safely through the woods, when there has been no trail cut. It is only necessary that the track should be broken and pressed down by one or two men on snow shoes, going ahead the first time after a deep fall of snow.

Of the mines, as I before remarked, I have not seen much this season. Every day, however, I hear accounts from some of them. Already visitors from below, mostly from Pittsburg, Penn., are passing about from one to another, and I hear but one general feeling of satisfaction expressed, and

among the strangers of wonder at the extraordinary developments of massive copper at some of the mines. These exceed anything ever before dreamed of, and no person who comes up to the country for the first time seems to have any conception of the huge blocks of solid copper he finds standing in the lodes or drawn up to the surface to be cut into portable shapes before being sent below. Many mining tracts have been purchased of the government since last fall, and several new companies have commenced operations in well selected localities. One only, the Copper Falls, which has been struggling on for several years, has stopped work: being the last of those companies which have attempted to prosecute mining operations entirely on the north side of the trap range. The prospects of no company appeared better than of this in the year 1845; but the failure of all similarly situated to it, has since inspired a general distrust of the productiveness of the veins in the alternating belts of trap and sandstone north of the main ridge. Of all the veins on the south side the trap range, which have been opened in the amygdaloidal trap there is no instance yet of any failure; and new operations are now commenced there with much spirit and confidence.

In the Ontonagon region the prospects are even still more encouraging. On the whole range not a single company that have been operating have met with any cause to excite distrust in the wonderful productiveness of the veins of copper; tho' the remoteness of many of them from the river and lake will for a time prove a serious cause of additional expense in the transportation of supplies and of copper. Here, too, many new tracts have been purchased, and some new companies have gone into operation. On the east, the Algonquin and Douglass Houghton are vigorously at work mining and establishing mining settlements. It is this necessary founding of a colony at each mine—including the making of roads—building of houses, the logs, shingles and boards for which have all to be prepared by the company, the preparation of machinery for the mine, the procuring of hay, oats and potatoes, that absorb the capital, and produce no direct returns of copper. Much of the products of the mine being stamp work, this must be kept on hand until a mill is erected for its preparation for shipment—thus several years may pass before the mine, however rich it may be, is fairly in condition for prosperous working. The two mines just named are in the embryo state, like most of the others: they have the last winter and spring sufficiently proved their productiveness to warrant the establishment of permanent works for putting their vein-stuff into marketable shape.

So it is with the Adventure and the Ridge mine next west of it, both which are several miles nearer the Ontonagon river. The workings beneath the ancient pits at the mines have brought to light masses of copper, rich stamp work, and at the Ridge mine considerable silver in lumps of several ounces. The Aztec mine, adjoining the Adventure on the east, of more external show of ancient works than any of them, remains untouched, and so of several other adjoining tracks which have been entered. Until a plank road is constructed to the mouth of the river, the expenses of transportation will prove a serious obstacle to the working of these mines.

The Minnesota has been more extensively worked than any of the others. From its great vein twenty-six tons of mass copper were shipped from the mouth of the river this month, and about fifty-five

tons more here are ready to come down. Besides this, a large quantity of stamp work is ready for the stamp, which will be completed, it is expected, in a about six weeks. It is a reasonable estimate that these will add 100 tons to the shipment of this year. The mine presents a wonderful display of great masses of copper, some thrown down, and some still standing in the vein. The deepest drift is only 85 feet below the surface, which is the level of the adit. This drift is 350 feet in length; the next drift is 30 feet higher, and is 150 feet long. There are three shafts, all going down to the adit level. The greatest thickness of any mass is 40 inches, though their prongs often run into the walls a distance across the vein of six feet. The weight of one single mass, broken off from its continuation in the end of the drift is estimated at 40 tons. The four parallel veins of this tract are distinctly recognized upon the other mining tracts ten or twelve miles east of the Minnesota, and also on the other side of the river. Should they be found as far as they are known, and even where they have been extensively worked by the ancients, half as productive as they have proved at those points only where they have been opened, they must very soon become objects of most extensive exploration, and throw more copper into our markets, than any man who has a regard for his reputation would think it prudent to suggest as possible. As wild a scheme of speculation as was ever entered into—blindly commenced and conducted without experience, and without knowledge of the country, ended naturally enough in a general failure; but it was no failure of the copper mines, for these were never found, or if found, were not recognized. This result, foretold, as well as the speculations themselves by Dr. Houghton, has left a stigma upon the mines they do not deserve; but which they are themselves now rapidly removing. Were the spots already entered the objects of the lavish expenditure before thrown away in barren places, or were they furnished with a greater part of the the capital that English miners judge essential for the plant of a mine, the result I fully believe would be such as not only to astonish the world, but seriously to affect the value of the copper business, where it is now most prosperous.

On the west side of the river the tract of the *Forest mine* covers several sections along the trap ridge. On these are found at least four parallel veins like those of the Minnesota in precisely the same geological position. On these too are ancient pits, in the rubbish of which are found hammers and other relics. In one of the veins only three or four feet below where the ancients worked, and only twenty feet below the surface, a mass of copper has been struck, which so far as has been exposed measures three and a half feet across its width and passes obliquely downwards into the floor, standing now over three feet in height above it. How large it will prove no one can form any estimate. A shaft has been sunk here 100 feet in depth and an adit and levels run, all since last October, and much good stamp and barrel work extracted. It is questionable, however, whether the work done was on the same vein as the mass above. This company is nearer to navigable water than any other on the lake, their workings being less than two miles by actual measurement from the river, to which it is a down grade or level all the way; and some of the ancient works on the trap ridge extend to within a mile of the river.

Further west the "*Ohio Trap Rock Company*" have commenced mining full ten miles back, but

fourteen miles from their landing towards the mouth of the Ontonagon. They raised last year some fine masses of copper and good stamp work; but the expenses of transportation probably caused them to tie by for the present, until some facilities shall have been provided for their reduction. This locality too is characterized by the four parallel veins and the ancient works upon them.

On the Minnesota tract a new company called the *Peninsula* is to have this season a plot set off to them for the commencement of new operations.

South of the Minnesota the *Ontonagon Company* have been prosecuting work, but more upon the surface, as in clearing land and building houses, than in the mine. In this, however, they find a promising vein, and have extracted some copper, mostly in stamp work.

DEPTHS OF SQUARE BARS OF CAST IRON, calculated to support from 1 cwt. to 14 tons in the center, the deflexion not exceeding one fortieth of an inch each foot in length.

Length in feet.		10		12		14		16		18		20	
Wght	Wght	Depth		Depth		Depth		Depth		Depth		Depth	
in cwt.	in lbs.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.
1 cwt.	112	1.9	2.0	2.2	2.4	2.5	2.6	2.8	3.0	3.1	3.3	3.4	3.6
2	124	2.2	2.4	2.6	2.8	2.9	3.1	3.3	3.5	3.7	3.8	4.0	4.2
3	336	2.4	2.7	2.9	3.1	3.3	3.5	3.7	3.9	4.1	4.3	4.5	4.7
4	448	2.6	2.9	3.1	3.3	3.5	3.7	3.9	4.1	4.3	4.5	4.7	4.9
5	560	2.8	3.0	3.3	3.5	3.7	3.9	4.1	4.3	4.5	4.7	4.9	5.1
10	1,120	3.3	3.6	3.9	4.2	4.4	4.7	4.9	5.2	5.5	5.8	6.1	6.4
15	1,680	3.6	4.0	4.3	4.6	4.9	5.2	5.5	5.8	6.1	6.4	6.7	7.0
1 ton.	2,240	3.9	4.3	4.6	4.9	5.2	5.5	5.8	6.1	6.4	6.7	7.0	7.3
1 1/4	2,800	4.1	4.5	4.9	5.2	5.5	5.8	6.1	6.4	6.7	7.0	7.3	7.6
1 1/2	3,360	4.3	4.7	5.1	5.5	5.8	6.1	6.4	6.7	7.0	7.3	7.6	7.9
1 3/4	3,920	4.5	4.9	5.3	5.7	6.0	6.3	6.7	7.0	7.3	7.6	7.9	8.2
2	4,480	4.7	5.1	5.5	5.9	6.2	6.5	6.8	7.1	7.4	7.7	8.0	8.3
2 1/4	5,040	4.9	5.3	5.7	6.1	6.4	6.7	7.0	7.3	7.6	7.9	8.2	8.5
3	6,720	5.1	5.6	6.0	6.4	6.7	7.0	7.3	7.6	7.9	8.2	8.5	8.8
3 1/4	7,840	5.3	5.8	6.2	6.6	6.9	7.2	7.5	7.8	8.1	8.4	8.7	9.0
4	8,960	5.5	6.0	6.4	6.8	7.1	7.4	7.7	8.0	8.3	8.6	8.9	9.2
5	11,200	5.8	6.3	6.7	7.1	7.4	7.7	8.0	8.3	8.6	8.9	9.2	9.5
6	13,440	6.1	6.6	7.0	7.4	7.7	8.0	8.3	8.6	8.9	9.2	9.5	9.8
7	15,680	6.3	6.8	7.2	7.6	7.9	8.2	8.5	8.8	9.1	9.4	9.7	10.0
8	17,920	6.6	7.1	7.5	7.9	8.2	8.5	8.8	9.1	9.4	9.7	10.0	10.3
9	20,160	6.8	7.3	7.7	8.1	8.4	8.7	9.0	9.3	9.6	9.9	10.2	10.5
10	22,400	7.0	7.5	7.9	8.3	8.6	8.9	9.2	9.5	9.8	10.1	10.4	10.7
15	33,600	7.7	8.2	8.6	9.0	9.3	9.6	9.9	10.2	10.5	10.8	11.1	11.4
20	44,800	8.0	8.5	8.9	9.3	9.6	9.9	10.2	10.5	10.8	11.1	11.4	11.7
30	67,200	8.8	9.3	9.7	10.1	10.4	10.7	11.0	11.3	11.6	11.9	12.2	12.5
40	89,600	9.3	9.8	10.2	10.6	10.9	11.2	11.5	11.8	12.1	12.4	12.7	13.0
50	112,000	9.7	10.2	10.6	11.0	11.3	11.6	11.9	12.2	12.5	12.8	13.1	13.4
60	134,000	10.0	10.5	10.9	11.3	11.6	11.9	12.2	12.5	12.8	13.1	13.4	13.7
Deflexion in in.		.25	.3	.35	.4	.45	.5	.55	.6	.65	.7	.75	.8

Length in feet.		22		24		26		28		30	
Wght	Wght	Depth		Depth		Depth		Depth		Depth	
in cwt.	in lbs.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.
1 cwt.	112	2.7	2.9	3.0	3.1	3.2	3.3	3.4	3.5	3.6	3.7
2	124	3.3	3.4	3.6	3.7	3.8	3.9	4.1	4.2	4.3	4.4
3	336	3.6	3.8	3.9	4.1	4.2	4.3	4.5	4.6	4.7	4.8
4	448	3.9	4.1	4.2	4.4	4.5	4.6	4.8	4.9	5.0	5.1
5	560	4.1	4.3	4.4	4.6	4.7	4.8	5.0	5.1	5.2	5.3
10	1,120	4.9	5.2	5.3	5.5	5.6	5.7	5.9	6.0	6.1	6.2
15	1,680	5.4	5.7	5.8	6.0	6.1	6.2	6.4	6.5	6.6	6.7
1 ton.	2,240	5.8	6.0	6.2	6.4	6.5	6.6	6.8	6.9	7.0	7.1
1 1/4	2,800	6.1	6.3	6.5	6.7	6.8	6.9	7.1	7.2	7.3	7.4
1 1/2	3,360	6.4	6.6	6.8	7.0	7.1	7.2	7.4	7.5	7.6	7.7
1 3/4	3,920	6.7	6.9	7.1	7.3	7.4	7.5	7.7	7.8	7.9	8.0
2	4,480	6.8	7.1	7.3	7.5	7.6	7.7	7.9	8.0	8.1	8.2
2 1/4	5,040	7.3	7.6	7.8	8.0	8.1	8.2	8.4	8.5	8.6	8.7
3	6,720	7.6	7.9	8.1	8.3	8.4	8.5	8.7	8.8	8.9	9.0
3 1/4	7,840	7.9	8.2	8.4	8.6	8.7	8.8	9.0	9.1	9.2	9.3
4	8,960	8.2	8.5	8.7	8.9	9.0	9.1	9.3	9.4	9.5	9.6
5	11,200	8.6	8.9	9.1	9.3	9.4	9.5	9.7	9.8	9.9	10.0
6	13,440	9.0	9.3	9.5	9.7	9.8	9.9	10.1	10.2	10.3	10.4
7	15,680	9.4	9.7	9.9	10.1	10.2	10.3	10.5	10.6	10.7	10.8
8	17,920	9.7	10.0	10.2	10.4	10.5	10.6	10.8	10.9	11.0	11.1
9	20,160	10.0	10.3	10.5	10.7	10.8	10.9	11.1	11.2	11.3	11.4
10	22,400	10.3	10.6	10.8	11.0	11.1	11.2	11.4	11.5	11.6	11.7
15	33,600	11.4	11.7	11.9	12.1	12.2	12.3	12.5	12.6	12.7	12.8
20	44,800	12.5	12.8	13.0	13.2	13.3	13.4	13.6	13.7	13.8	13.9
30	67,200	13.5	13.8	14.0	14.2	14.3	14.4	14.6	14.7	14.8	14.9
40	89,600	14.5	14.8	15.0	15.2	15.3	15.4	15.6	15.7	15.8	15.9
50	112,000	15.3	15.6	15.8	16.0	16.1	16.2	16.4	16.5	16.6	16.7
60	134,000	16.0	16.3	16.5	16.7	16.8	16.9	17.1	17.2	17.3	17.4
Deflexion in in.		.55	.6	.65	.7	.75	.8	.85	.9	.95	1.0

Examples.—1. To find the depth of a rectangular bar of cast iron to support a weight of 10 tons in the middle of its length, the deflection not to exceed one-fortieth of an inch per foot in length, and its length 20 feet, also let the depth be 6 times the breadth.

Opposite 6 times the weight and under 20 feet in length is 15.3 inches the depth, and one-sixth of 15.3=2.6 inches the breadth.

2. To find the diameter for a cast iron shaft or solid cylinder that will bear a given pressure, the flexure in the middle not to exceed one-fortieth of an inch for each foot of its length, the distance of the bearings being 20 feet, and the pressure on the middle equals 10 tons.

Constant multiplier 1.7 for round shafts, then $10 \times 1.7 = 17$. And opposite 17 tons and under 20 feet is 11.2 inches for the diameter.

But half that flexure is quite enough for revolving shafts: hence $17 \times 2 = 34$ tons, and opposite 34 tons is 13.3 inches for the diameter.

The above calculations of the strength of cast iron bars are founded on experiments of Mr. Hodgkinson of Manchester, and are extracted from his new edition of *Tredgold's*—(Abstract of Table, *Weale's Engineer's Pocket-book*.)

THE WEIGHT OR PRESSURE WHICH IS CALCULATED A COLUMN OF CAST IRON WILL SUSTAIN WITH SAFETY.

Length or height in feet.		4		6		8		10		12		14	
Diameter.	Inch.	Weight in cwt.	Weight in lbs.	Weight in cwt.	Weight in lbs.	Weight in cwt.	Weight in lbs.	Weight in cwt.	Weight in lbs.	Weight in cwt.	Weight in lbs.	Weight in cwt.	Weight in lbs.
2 1/2	119	105	91	77	65	55							
3	178	163	145	128	111	97							
3 1/2	247	232	214	191	172	156							
4	326	310	288	266	242	220							
4 1/2	418	400	379	354	327	301							
5	522	501	479	452	427	394							
6	607	592	573	550	525	497							
7	1032	1013	989	959	924	887							
8	1333	1315	1289	1259	1224	1185							
9	1716	1697	1672	1640	1605	1561							
10	2119	2100	2077	2045	2007	1964							
11	2570	2550	2520	2490	2450	2410							
12	3050	3040	3020	2970	2930	2900							

Length or height in feet.		16	18	20	22	24
Diameter.		Weight in cwis.	Weight in cwis.	Weight in cwis.	Weight in cwis.	Weight in cwis.
Inch.						
2½		47	40	34	29	25
3		84	73	64	56	49
3½		135	119	106	94	83
4		198	178	160	144	130
4½		275	251	229	208	189
5		365	337	310	285	262
6		469	440	413	386	360
7		848	808	765	725	686
8		1142	1097	1052	1005	959
9		1515	1467	1416	1364	1311
10		1916	1865	1811	1755	1697
11		2356	2305	2245	2189	2127
12		2830	2780	2730	2670	2600

RELATIVE WEIGHT AND STRENGTH OF ROPES AND CHAINS.

Cir. of Rope in in.	Weight per fath. in lbs.	Diameter of Chain, in in.	Weight per fath. in lbs.	Proof strength in tons & cwt.
3½	2½	5-16	5½	1 5½
4½	4½	7-16	8	1 16½
5½	5½	7-16	10½	2 10
6½	7	1	14	3 5½
7½	9½	9-16	18	4 3½
8½	11½	1	22	5 2
9½	15	11-16	27	6 4½
10½	19	1	32	7 7
11½	21	13-16	37	8 13½
12½	23	1	43	10 0
13½	28	15-16	49	11 11
14½	30½	1	56	13 8
15½	36	1 1-10	63	14 18
16½	39	1½	71	16 14
17½	45	1 3-16	79	18 11
18½	48½	1½	87	20 8
19½	56	1 5-16	96	22 13
20½	60	1½	106	24 18

WEIGHT OF A LINEAL FOOT OF CAST IRON PIPES IN POUNDS.

Diameter of bore in inches.	Thickness of the metal in inches.	Weight in lbs.
2	8-8	12-3
2½	10-6	14-7
3	12-4	17-2
3½	14-2	19-6
4	16-1	22-1
4½	18-0	24-5
5	19-8	27-0
5½	21-6	29-5
6	23-5	31-9
6½	25-3	34-4
7	27-2	36-8
7½	29-0	39-1
8	30-8	41-7
8½	32-9	44-4
9	34-5	46-6
9½	36-3	49-1
10	38-2	51-5
10½	40-0	54-0
11	41-8	56-4
11½	43-6	58-9
12	45-4	61-3
13	47-2	63-7
14	49-0	66-1
15	50-8	68-5
16	52-6	70-9
17	54-4	73-3
18	56-2	75-7
19	58-0	78-1
20	59-8	80-5

Diameter of bore in inches.	Thickness of the metal, in inches.	Weight in lbs.
2	1	14
2½	1½	18
3	2	22
3½	2½	26
4	3	30
4½	3½	34
5	4	38
5½	4½	42
6	5	46
6½	5½	50
7	6	54
7½	6½	58
8	7	62
8½	7½	66
9	8	70
9½	8½	74
10	9	78
10½	9½	82
11	10	86
11½	10½	90
12	11	94
12½	11½	98
13	12	102
13½	12½	106
14	13	110
14½	13½	114
15	14	118
15½	14½	122
16	15	126
16½	15½	130
17	16	134
17½	16½	138
18	17	142
18½	17½	146
19	18	150
20	19	154

The two flanges of a pipe are considered as equal to the weight of one foot in length.

RELATIVE STRENGTH OF BODIES TO RESIST TORSION.

Lead	1-0	Swedish iron	9-5
Tin	1-4	English ditto	10-1
Copper	4-3	Blistered steel	16-6
Yellow brass	4-6	Shear ditto	17-0
Gun metal	5-0	Cast ditto	19-5
Cast iron	9-0		

COMPARATIVE STRENGTH, SIZE AND WEIGHT OF IRON WIRE ROPE, HEMPEN ROPE, AND IRON CHAIN.

Breaking Weight in tons.	Description.	Size in inches.	Weight per fathom.
4	Wire rope	1 circum.	0 12
	Hemp rope	2 do.	1 1
	Chain	1 diam.	3 0
8	Wire rope	2 circum.	2 10
	Hemp rope	5 do.	6 0
	Chain	1 diam.	16 0
12	Wire rope	2½ circum.	4 8
	Hemp rope	7 do.	12 3
	Chain	11-16 diam.	27 0
16	Wire rope	3 circum.	6 12
	Hemp rope	8 do.	14 3
	Chain	13-16 diam.	36 0
20	Wire rope	3½ circum.	9 4
	Hemp rope	9 do.	19 6
	Chain	29 32 diam.	46 0
24	Wire rope	4 circum.	13 4
	Hemp rope	10 do.	25 0
	Chain	31-32 diam.	53 0
30	Wire rope	4½ circum.	16 5
	Hemp rope	11 do.	30 0
	Chain	1 1-16 diam.	62 0
36	Wire rope	5 circum.	22 5
	Hemp rope	12½ do.	35 10
	Chain	1 3-10 diam.	78 0
44	Wire rope	5½ circum.	27 0
	Hemp rope	14 do.	41 10
	Chain	1 5-10 diam.	96 0
54	Wire rope	6 circum.	34 0
	Hemp rope	15 do.	47 8
	Chain	1 7-10 diam.	115 0

WEIGHT OF MODULUS OF ELASTICITY OF VARIOUS METALS.

Metal.	Elasticity in lbs.
Steel	29,000,000
Wrought iron	24,920,000
Cast iron	18,400,000
Zinc	13,680,000
Gun metal	9,873,000
Brass	8,930,000
Tin	4,608,000
Lead	720,000

Note.—The modulus of elasticity for oak is 1,714,500, and for cast iron 18,400,000, or 10-7 times that of oak; hence, cast iron is 10-7 times as stiff as a piece of oak of equal dimensions and bearing.

WEIGHT OF COPPER PIPES, 12 INCHES IN LENGTH AND ½ OF AN INCH IN THE KNEES.

Diameter of bore in inches.	Weight in lbs.
1	1-33
1½	1-69
2	2-08
2½	2-87
3	3-21
3½	3-97
4	4-78

WEIGHT OF A SUPERFICIAL FOOT OF VARIOUS METALS IN LBS.

Names.	1	2	3	4	5	6	7	8
Iron	12-50	12-00	11-00	10-00	8-74	8-12	7-50	6-86
Cop.	14-50	13-90	12-75	11-60	10-10	9-40	8-70	7-90
Brass	13-75	13-20	12-10	11-00	9-61	8-93	8-25	7-54
	9	10	11	12	13	14	15	
Iron	6-24	5-62	5-00	4-38	3-75	3-12	2-82	
Cop.	7-20	6-50	5-80	5-08	4-34	3-60	3-27	
Brass	6-86	6-18	5-50	4-81	4-12	3-43	3-10	

Thickness by the Birmingham Wire Gauge.	16	17	18	19	20	21	22	23
Iron	2-50	2-18	1-86	1-70	1-54	1-40	1-25	1-12
Cop.	2-90	2-52	2-15	1-97	1-78	1-63	1-45	1-30
Brass	2-75	2-40	2-04	1-87	1-69	1-54	1-37	1-23
	24	25	26	27	28	29	30	
Iron	1-00	0-90	0-80	0-73	0-64	0-56	0-50	
Cop.	1-16	1-04	0-92	0-83	0-74	0-64	0-58	
Brass	1-10	0-99	0-88	0-79	0-70	0-61	0-55	

Thickness in parts of an Inch.

	1-16	3-16	5-16	7-16
Iron	2-5	5	7-5	10
Cop.	2-9	5-8	8-7	11-6
Brass	2-7	5-5	8-2	10-9
Lead	3-7	7-4	11-1	14-8
	7-16	1	1	1
Iron	17-5	20	25	30
Cop.	20-3	23-2	28-9	34-7
Brass	19-0	21-8	27-1	32-5
Lead	25-9	29-6	37-0	44-4
				57-8
				59-2

Liverpool Docks.

The docks of Liverpool have been gradually increased and enlarged at a great expense, to meet the wants of the vast and increasing commerce of the port. An immense range of docks and ware houses extends nearly two miles along the banks of the river. The docks are of three kinds, wet docks, dry docks, and graving docks. The wet docks are chiefly used for vessels of large burden, in which they can float at all tides, the water being retained by means of gates. The dry docks are left dry at low tides, and are generally occupied by coasting vessels of smaller tonnage. The graving docks can have the water admitted or excluded at pleasure, and are appropriated to the repairing of ships. The Old Dock was situated about the centre of this line of docks. A little to the north of this, and nearer to the river, is the Canning Dock, a dry dock constructed in the reign of George II., which is now converted into a wet dock; it contains an area of 19,095 square yards, and has a quay 500 yards long; it has communication with three graving docks. To the south of this is the Salthouse Dock, so called from some salt works formerly contiguous to it, but now removed up the river to Garston. It was constructed about the same time as the dry dock; its area is 23,025 square yards, and its quay is 759 yards in extent; it has convenient warehouses, with arcades for foot passengers on the east side, and extensive sheds on the west side. The upper part of this dock is principally appropriated to ships which are laid up, and the lower part for vessels in the Mediterranean, Irish, and coasting trades. The whole of the buildings between its north end and the south end of Canning Dock have been taken down, and the space thus gained has been appropriated to the improvement of the dock and quay at the north end. The King's Dock, on the south of Salthouse Dock, was constructed in the reign of George III.; it encloses an area of 37,776 square yards; its quay is 875 yards in length. Tobacco is exclusively landed here, and on the west side of the quay are extensive warehouses appropriated to this article; they are 575 feet in length, and 239 in depth. There were warehouses on the opposite side, which are now converted into sheds for the security of merchandise. Across the entrance of the quay is a handsome swivel bridge of cast iron. A dry dock or basin, and two graving docks, communicate with this dock on the south; in the same direction a little further from the river, and also communicating with the basin, is the Queen's Dock, constructed about the same time as the King's Dock; its area is 41,501 square yards, and the quay is 1,255 yards long. This dock communicates on the south with another, called the Half Tide Dock, and is connected on the west with the Brunswick Dry Basin. On the south of this is the New Brunswick Dock, opened in 1832, of much larger dimensions than any of the preceding, its area being 70,069 square yards, and its quay 1,092 yards long.—It has a graving dock at the south end. This dock

at present forms the southern extremity of the docks. On the north of Canning Dock is George's Dock, originally constructed in the beginning of the reign of George III., and since enlarged. It now contains 26,793½ square yards; the quay is 1,001 yards in length, on the east side of which is a range of extensive warehouses, and an arcade for foot passengers; on the west side are sheds for the protection of merchandise from the weather. At each end of the dock are handsome cast iron bridges. On the north of this is Prince's Dock, which was constructed in the latter part of the reign of George III., and was opened with much ceremony on the day of the coronation of George IV. It has an area of 57,129 square yards, and a quay 1,613 yards long. Prince's Dock, George's Dock, Canning Dock, and Salthouse Dock, communicate with each other by basins. Along the west side of the dock is a parade near the river, 750 yards long and 11 wide, defended by a parapet wall; from this parade there are flights of steps leading to the river. To the north of the basin attached to the Prince's Dock are four spacious wet decks, with the following dimensions:—

	Area in sq. yds.	Length of quays in yards.
Waterloo Dock.....	30,764½	1012
Clarence Dock.....	29,085½	839
Trafalgar Dock.....	33,642½	1050
Victoria Dock.....	29,313	914

Here is also a large graving dock, fitted up with patent slips. A small dock with convenient warehouses, situated between Salthouse and the King's Dock, belongs to the trustees of the late Duke of Bridgewater. The Mersey and Irwell Navigation Company have a small dock situated between the Canning and George's Dock, called the Manchester Dock. The several carriers by water have also basins with quays for the accommodation of their respective barges. A dredging machine in constant use worked by a steam engine of ten horse power, for clearing the docks from the deposits brought up by the tides; fifty tons of silt are thus raised per hour into barges, by which it is conveyed to an open part of the river, where it is washed away by the current. The total dock room of this port is 111 acres, and the quay space is nearly eight miles in length.

Railway Law in Canada.

An Act to provide for affording the Guarantee of the Province to the Bonds of Railway Companies on certain conditions, and for rendering assistance in the construction of the Halifax and Quebec Railway, passed May 30th, 1849.

Whereas at the present day, the means of rapid and easy communication by railway, between the chief centres of population and trade in any country and the more remote parts thereof, are become not merely advantageous, but essential to its advancement and prosperity; and whereas experience has shown, that whatever be the case in long settled, populous and wealthy countries, in those which are new and thinly peopled and in which capital is scarce, the assistance of government is necessary and may be safely afforded to the construction of lines of railway of considerable extent; and that such assistance is best given by extending to companies engaged in constructing railways of a certain length, under charter from, and consequently with the approval of the legislature, the benefit of the guarantee of the government, under proper conditions and restrictions, for loans raised by such companies to enable them to complete their work: be it therefore enacted by the Queen's Most Excellent Majesty, by and with the advice and consent of the legislative council and of the legislative assembly of the Province of Canada, constituted and assembled by virtue of and under the authority of an act passed in the parliament of the United King-

dom of Great Britain and Ireland, and entitled, An Act to re-unite the Provinces of Upper and Lower Canada, and for the Government of Canada; and it is hereby enacted by the authority of the same, That it shall be lawful for the governor in council, on behalf of this Province, to guarantee the interest on loans to be raised by any company chartered by the legislature of this Province for the construction of a line of railway not less than seventy five miles in extent, within this Province, on condition—that the rate of interest guaranteed shall not exceed six per cent. per annum—that the sum on which interest shall be so guaranteed shall not be greater than that expended by the company before the guarantee is given, and shall be sufficient to complete their road in a fitting manner, and to the satisfaction of the commissioners of public works, provided always, that no such guarantee be given to any company until one half of the entire line of road shall have been completed—that the payment of the interest guaranteed by the Province shall be the first charge upon the tolls and profits of the company, and that no dividend shall be declared so long as any part of the said interest remains unpaid—that so long as any part of the principal on which interest is guaranteed by the Province remains unpaid, no dividend shall be paid to the stockholders, until a sum equal to three per cent. on the amount so remaining unpaid, shall have been set aside from the surplus profits of such railroad, and paid over to the receiver general under the provisions hereinafter contained as a sinking fund for the redemption of the debt on which interest is guaranteed as aforesaid—and that the Province shall have the first hypothec, mortgage and lien upon the road, tolls and property of the company for any sum paid or guaranteed by the Province, excepting always, the hypothec, mortgage or lien of holders of bonds or other securities on which interest is guaranteed by the Province, for the interest so guaranteed and the principal on which it shall accrue.

II. And be it enacted, That each railway company, deriving any aid or advantage under this act, shall make up and render to the inspector general of public accounts of this Province, each half year, a true account in writing of the affairs of such company, in such form and with such particulars as the said inspector general shall from time to time require, which said accounts shall be signed by the president and the directors of the said company, or a quorum of that body, and shall be sworn to by the parties signing the same before one of the Judges of the Superior courts of common law jurisdiction in Upper Canada, or one of the Judges of the court of superior civil jurisdiction in Lower Canada, and the said company or the proper officer thereof shall, within ten days after the rendering of such account, pay over such amount as may be payable under the provisions of this act to the receiver general or this Province.

III. And be it enacted, That the sum or sums of money hereinbefore provided to be taken from the surplus profits of any railroad as a sinking fund, shall be invested by the inspector general of this Province in such securities of this Province as may be approved by the governor in council; provided always, that it shall be lawful for the directors of any such company to make such by-laws as may be requisite to prevent the provision of this act in respect of such sinking fund from bearing unequally upon any class of stockholders.

IV. And be it enacted, That, provided the conditions mentioned in the foregoing section be observed, it is expedient that such guarantee be afforded under such further terms and conditions as may be deemed necessary by the governor in council and agreed to by the company applying for such guarantee, it being clearly understood, that no enactments which the legislature may hereafter make to ensure the observance of such terms and conditions, or to give effect to the privileged claim and lien of the Province upon the road, tolls and property of the company, or to secure the Province from loss by such guarantee, shall be deemed an infringement of the rights of the company.

V. And whereas the proposed railway between Halifax and Quebec will be a great national work, linking together the several portions of the British empire on the continent of North America, and facilitating the adoption of an extensive, wholesome

and effective system of emigration and colonization, and it is right that Canada should render such assistance as her means will admit of towards the accomplishment of a work so important, and promising results so beneficial; Be it therefore enacted, That if her majesty's government shall undertake the construction of the said railway, either directly or through the instrumentality of a private company, it shall be lawful for the governor in council, on behalf of this Province, to undertake to pay yearly, in proportion as the work advances, a sum not exceeding twenty thousand pounds sterling, towards making good the deficiency (if any) in the income from the railway, to meet the interest of the sum expended upon it, and to place at the disposal of the imperial government all the ungranted lands within the Province for the line of the railway, and for proper stations and termini.

VI. And be it enacted, That any lands to be taken under the provisions of the next preceding section, for the purposes therein mentioned, shall be deemed to be lands required for public provincial works, and may be taken by the commissioners of public works under the provisions of the act passed in the ninth year of her majesty's reign, and intitled, *An Act to amend the Law constituting the Board of Works*, and of any act amending the same.

VII. And be it enacted, That any moneys which shall be payable on behalf of the Province under any of the provisions of this act, may be paid out of any unappropriated moneys forming part of the consolidated revenue fund; and that all moneys due by any company as having been paid for them under any guarantee given under this act, shall be deemed moneys due by such company to her majesty, payable according to the provisions of this act, and the conditions agreed upon by the governor in council and such company.

Railroad Law.

S. J. COURT OF MAINE.

Cumberland Co., April Term, 1850.

James Deering in Equity—York and Cumberland Railroad Company.

This was a bill in equity praying for an injunction to restrain the defendants from further entering upon or using the plaintiff's land for the purpose of constructing their road—more especially through that portion of his homestead farm taken by the company, and lying in the town of Westbrook.

The plaintiff's bill sets forth that his farm was valuable for purposes of cultivation, and containing trees valuable for fruit and ornament—that the location of the railroad across it would injure it for these purposes, and would, if permitted to be used by the laying down of the rails and running of engines propelled by steam, constitute a nuisance.

He further contended that the act establishing the Y. & C. railroad company, which authorized the taking of the land for the purposes of the road, was unconstitutional and void, under that provision of the Constitution of Maine, Art. 1, sec. 21, which provides that "private property shall not be taken for public uses without just compensation, nor unless the public exigencies require it."

The act of July 30, 1846, sec. 1, establishing the York and Cumberland Railroad company, contained the following provisions:

"And said corporation shall be and hereby are invested with all the powers, privileges, and immunities, which are or may be necessary to carry into effect the purposes and objects of this act as herein set forth; and for this purpose said corporation shall have the right to purchase, or to take and hold, so much of the land and other real estate of persons and corporations, as may be necessary for the location, construction, and convenient operation of said railroad; and that they shall also have the right to take and use for the construction and repair of said railroad and appurtenances, any earth, gravel, stone, timber or other materials, on or from the road so taken: provided, however, that said land so taken, shall not exceed six rods in width, except where greater width is necessary for the purpose of excavation or embankment. And provided also, that in all cases, said corporation shall pay for such lands, estates, or materials so

taken and used, such price as they and the owner or respective owners thereof may mutually agree on; and in case said parties shall not otherwise agree, the said corporation shall pay such damages as shall be ascertained and determined by the county commissioners, for the county where such lands or other property may be situated, in the same manner, and under the same conditions and limitations, as are by law provided in case of damages by the laying out of highways; and the land so taken by the corporation shall be held as lands taken and appropriated for public highways. And no application to said commissioners to estimate said damages shall be sustained, unless made within three years from the time of taking such land or other property; and in case such railroad shall pass through any wood lands or forests, the said company shall have the right to fell or remove any trees standing thereon, within four rods from said road, which by their liability to be blown down, or from their natural falling, might obstruct or impair said railroad; by paying a just compensation therefor, to be recovered in the same manner as is provided for the recovery of other damages in this act. And furthermore, said corporation shall have all the powers, privileges, and immunities, and be subject to all the duties and liabilities, provided and prescribed, respecting railroads in chapter eighty-one of the revised statutes, not inconsistent with the express provisions of their charter."

The plff. contended that this section furnished no certain and adequate provisions for the payment of damages, or compensation for the property taken for the use of said company.

The plff. further contended, that if the act was constitutional, it could be construed as giving the right to take land, only on the conditions that the property so taken should be previously paid for, at such price as could be agreed upon, or such sum as could have been ascertained and awarded by the County Commissioners, or by a jury, previous to any entry thereon, except for the mere purposes of survey and location.

The title of the plff. to the land in question, and the entry thereon by the defendants for the purposes of building their road, were admitted for the purposes of the hearing, and it was further admitted that no injury had been done to the plff beyond the mere taking of his land. No agreement for compensation had been made, nor had any proceedings been instituted by either party, for the purpose of ascertaining the value of the plff's land so taken at the time of filing this bill.

W. P. FESSENDEN, Esq., for the Plff.

JOHN A. POOR, Esq., for the Defs.

The opinion of the Court was pronounced orally by WELLS Judge.

The plaintiff, by his bill in equity, charges the defendants with having committed waste upon his lands, and the doing of certain acts upon the same, which are denominated in the bill a nuisance to him. He also prays for an injunction to restrain the defendants from doing any further acts upon his premises, by virtue of their charter.

The injunction is asked for at the present time without a hearing upon the general merits of the bill; and the defendants, without making an answer to the bill, admit for the purposes of the hearing in relation to the injunction, that the facts stated in the bill are true.

It is contended by the plaintiff that, if the Act incorporating the defendants, allows them to take and use his land before compensation is made to him, then the act is so far unconstitutional and void. It is quite manifest that the act, by a fair construction of its language, does authorize the taking and using of the land before compensation is made; and in case the parties cannot agree upon the damages, they are determined by the county commissioners, in the same manner and under the same conditions and limitations as are by law provided in the case of damages by the laying out of highways. The statute chap. 81, sec. 6, when real estate is taken by a railroad corporation, directs the commissions, upon the request of the owner of such real estate, to require the railroad corporation to give security to the satisfaction of the commissioners, for the payment of damages and costs which may be awarded by jury or otherwise; and it further provides that the same authority of the

corporation to enter upon and use such real estate, except for making surveys, shall be suspended until the such security is given. And the charter of the defendants confers upon them all the rights and subjects them to all the liabilities provided in chap. 81, before mentioned, not inconsistent with all the provisions of the charter. Any party aggrieved by the doings of the commissioners in estimating damages, may have a jury to determine the matter of his complaint, agreeably to chap. 25, sec. 8.

By the charter and the provisions of the statute, defendants may continue to use the real estate taken, by giving the required security.

By the Constitution of this State, it is provided, Art. 1, sec. 21, that "private property shall not be taken for public uses without just compensation, nor unless the public exigencies require it."

The Constitution does not prescribe that the compensation shall be made before the property is taken, nor when it shall be made. In times of war and civil commotions, the government may need the property of its citizens for public uses, when the emergency is so pressing, that there is neither opportunity nor means for making compensation at the time when it is taken. Lands are required for highways, turnpikes, canals and ferries, and the Acts authorising them to be taken, have uniformly, so far as they have come to our notice, provided for compensation subsequently to be made.

But it is conceded, in cases where the owner of the land has a claim upon a town or county for damages, that there is then such a degree of certainty as will ensure the eventual payment, and that it would not be in violation of the Constitution to allow the property to be taken, where a public corporation would be liable for the compensation subsequently to be made.

But even in those cases, the compensation would not be absolutely certain, for governments are subject to revolutions, and they may fail of making payment. As all future earthly events are doubtful, if the payment provided, though not absolutely certain, may still be constitutional, can anything more be required than a reasonable certainty of it?

The law does not prescribe the kind of security with which the commissioners may be satisfied.

They may require a deposit of public stocks and the securities of a town, city, state, or of the United States. But they may require security of a less satisfactory character, and it may entirely fail, and the owner be subject to great injury, though not at the ultimate loss of his land.

This is strictly a Constitutional question of great magnitude, not only affecting the plaintiff, but having an important bearing upon the interests of others. Before the injunction can be granted, we must decide the act, incorporating the defendants, to be unconstitutional and void. And this decision we are called upon to make upon a mere interlocutory proceeding, without sufficient opportunity for examination and deliberation.

In the case of Moor vs. Veazie, the plaintiff asked for an injunction on the ground that the charter under which he acted was constitutional, and it was presumed to be so, so far as to authorise a temporary injunction. In that case, the charter was claimed to be valid; here, to be invalid; there we could grant what was asked, assuming the act to be in accordance with the Constitution; here we cannot do it, without deciding the act to be in opposition to the Constitution.

As we assumed in that case, the constitutionality of the Legislative Act, as we must in this, so far as relates to the application for an injunction at the present time. The same rule, which authorised it to be granted in that case, requires in this, that it should be refused. We base our conclusion upon the rule that an act of the Legislature ought not to be decided to be unconstitutional, upon a preliminary hearing of this nature, before an examination of the general merits of the bill.

We therefore decline at present from expressing any opinion in relation to the validity of the defendants' charter. We have stated enough to show what the question is, and that it is one requiring very great consideration, and the most careful and attentive investigation. It must take the ordinary course of judicial proceedings, and will be decided, if the nature of the case requires it, upon the final disposition of the plaintiff's bill.

The injunction is denied.

UNITED STATES CIRCUIT COURT,
Northern District of New York.

Ross Winans vs. Troy and Schenectady Railroad Company—Canandaigua, June Term, 1850.

This was an action brought by Ross Winans, of Baltimore, Md., for the violation of a patent granted to him, Oct. 1, 1834. The subject matter of the patent is the eight wheel passenger and burden car in general use on railroads throughout this country.

For the defence it was contended that the patent was void, for first, the want of novelty; second, for an imperfect specification; third, for an imperfect claim; fourth, for the want of a legal compliance with the statute; and fifth, on the ground of abandonment.

To prove the first two points, several English scientific works were brought forward, and numerous railway engineers, superintendents and experts, living in Washington, Boston, New York, Auburn, Buffalo and Batavia, gave in their testimony.

The trial occupied the attention of the court during eight days, and was finally given to the jury after an able charge from his honor, Judge Conkland, on Friday evening. After a short absence, they came in with a verdict for plaintiff.

The trial was regarded as a test case between the plaintiff, patentee, and the railroad co., defendants, it being agreed among the several companies of this State, that they would mutually aid and jointly bear the expense.

Never have we heard so clear an exposition of mechanical principles, or more stirring eloquence, than was exhibited during the progress of this case.

For the plaintiff—Hon. J. A. Spencer, C. M. Keller and S. Blatchford, Esqs.

For the defendants—Hon. S. Stevens, David Bucl, Jr. and A. Worden, Esqs.—*Albany paper.*

Can a Speed of Seventeen Miles an Hour be Attained in Ocean Steamers?

In our last issue we gave to our readers the plan set forth by the enterprising people of Maine for the purpose of shortening the time of passage between New York and London. Since then we have received a printed copy of the same, bearing the imprint of the Legislature of Maine, accompanying which is a finely executed map, showing the entire line between Washington and Paris, as the same is passed in sailing upon the great circle, or as the same may be passed by carrying out the plan proposed.

We have also the document in a pamphlet form, to which are appended some very valuable notes illustrating or enforcing the suggestions contained in the original petition. In support of the assertion, that a speed of seventeen miles an hour can yet be reached in ocean steamers, the following note is given.

Within the last ten years considerable changes have been made in the proportion and dimensions of the vessels navigating the Hudson river; all these changes having a tendency to augment their magnitude and power, to diminish their draft of water, and to increase the play of the expansive principle. Increased length and beam have been resorted to with great success. Vessels of the largest class now draw only as much water as the smallest drew a few years ago; 4 feet 6 in. is now regarded as the maximum. In the following table is exhibited the dimensions and other particulars of nine of the most efficient and most recently built steamers plying on the Hudson and its adjoining waters.

NAME.	Length.	Beam.	Depth of hold.	Tonnage.	Diam. of cylinder.	Length of strokes.	Number of strokes.	Diameter.	Length of bucket.	Depth of bucket.
Isaac Newton	333 40	4 10	0	81 12	18 1/2	39	0	12 4	32	32
Bay State	300 39	0 13	2	76 12 21	38	0	10	3	32	32
Empire State	304 39	0 13	6	76 12 21	38	0	10	3	32	32
Oregon	305 35	0	9	72 11 18	34	0	11	0	38	33
Hendrick Hudson	320 35	0	9	1050	72 11 18	34	0	11	0	33
C. Vanderbilt	300 35	0 11	0	1075	72 12 19	31	35	0	9	0
Connecticut	300 37	0 11	0	72 13 21	35	0	11	6	33	33
Commodore	290 33	0 10	6	65 11 22	31	6	9	0	33	33
New World	376 35	0 10	0	75 15 18	44	6	12	0	36	36
Alida	286 35	0 9	6	56 12 19	32	0	10	0	32	32

It is not only in dimensions that steamships have undergone improvements. The exhibition of the beautifully finished machinery of the English Atlantic steamers did not fail to excite the emulation of the American engineers and steamboat proprietors, who ceased to be content with the comparatively rude though efficient structure of the mechanism of their steamboats.

All the new and largest class of steamers, such as the Isaac Newton, the Hendrik Hudson, the New World, the Oregon and the Alida, are capable of running from 20 to 22 miles an hour, and make, on an average, 18 miles an hour without the least effort. These extraordinary speeds are obtained usually by rendering the boilers capable of carrying steam from 40 to 50 lbs. pressure above the atmosphere, and by urging the fires with fan-furners, worked by an independent engine, by which the furnaces can be forced to any desired extent.

The great power developed by these river engines according to Dr. Lardner, is due, not so much to the magnitude of their cylinders, as to the pressure of steam used in them. The New World, one of the most recently constructed boats, has a cylinder 76 inches in diameter, and 15 feet stroke. The steam has 40 lbs. pressure in the boiler, and is cut off at half stroke. The wheels, which are 45 in diameter, make 16 revolutions per minute. The speed of the circumference of the wheel will therefore be 25 miles an hour; so that, if the speed of the boat be 20 miles an hour, we have the difference, five miles, giving the relative movement of the edge of the paddle boards through the water.—Prof. Ewbank, Commissioner of Patents, and other able writers contend, that a greatly increased speed will be attained by adopting an improved system of paddle wheels.

Ocean Steam Navigation.

The same pamphlet gives the following interesting statements in regard to the progress, capacity of boats, and present arrangement of ocean steamers between the United States and Europe.

Three years ago ocean steam navigation was entirely in British hands. Two years since the only line of American steamships afloat suited to ocean navigation in the merchant service, consisted of the two small boats running between New York and Charleston and the Washington; the first in the Bremen line. There are now six large steamers running regularly between New York and Chagres. There are an equal or greater number on the Pacific side, and existing projects contemplate twenty in all within a year, for the Pacific seas. There are lines also to New Orleans, Havana, Savannah, Charleston, in addition to those named in the above list, and every ship yard and machine shop in New York city is tasked to its utmost capacity in this branch of service. There are no less than 17 ocean steamers on the stocks at the present time in New York city.

The competition between the American and English lines will soon call into use the best skill of both countries. The recent voyages of the Atlantic—the first of Collins' line—and of the Asia, the last of Cunard's boats, show that an increase of speed may still be expected in ocean steamers.—That route, or that line, which shall reduce the voyage to Europe to the shortest period of time, will be the most successful.

Ocean Steamers to run between the United States and Europe in 1850.

NAMES.	Tonnage.	Length.	Breadth.	Cost.	Diam. of cylinder.	Length of stroke.	Diam. of paddles.	Capacity of engine in horse power.
Collins' Line.								
Atlantic	3000	290	46	650,000	95	9 3/5	769	
Pacific	3000	290	46	650,000	95	9 3/5	760	
Baltic	3000							
Arctic	3000							
Adriatic	3000							
Cunard's Line.								
Caledonia	1250							500
Hibernia	1400							550
Cambria	1400							550
America	1800	275	40					700
Canada	1800	275	40					700
Niagara	1800	275	40					700
Europa	1800	275	40		10	8 3/2	700	
Asia	2250	300	42		36	9 3/6	800	
Africa	2250	300	42		36	9 3/6	800	
Havre Line.								
Franklin	3500	260	42	350,000	94	8 3/4		
Havre	2500			450,000				
Bremen Line.								
Washington	1750	230	39		72	10 3/5		
Hermann	1850	235	40		72	10 3/5		
Glasgow Line.								
Glasgow City	1600							350
Galway Line.								
Viceroy								

Would a Railroad from Bangor, Me., to Cape Canso or Halifax, Nova Scotia, pay?

The memorial before referred to contends that a business equal to 100 through passengers a day each way, would pay a good return upon the investment. In aid of this assertion, the following information is given in regard to the London and Northwestern railway; and the conclusions drawn from a comparison of the business of that road with the assumed business of the proposed line is given in the following note.

The London and Northwestern railway company was incorporated July 16, 1846, by which act several distinct lines were incorporated into one, and included the following lines, viz:

Liverpool and Manchester	31 miles.
Manchester and Birmingham	31
Birmingham to Newton	83
Macclesfield branch	10
Northampton and Peterborough	47 1/2
Bedford and Bletchley	16 1/2
Leamington and Coventry	9 1/2
Aylesbury	7
Bolton and Leigh	10
Chester and Crewe	21
London to Boxmoor	24 1/2
Boxmoor to Tring	7
Tring to Denbigh Hall	16 1/2
Birmingham to Rugby	29
Denbigh Hall to Rugby	35 1/2

Since opened:	378 1/2 mls.
Trent Valley (Sept. 18, 1847)	49 1/2
Unstuntable, (May 29, 1848)	7
Huddersfield and Manchester, and Leeds and Dewsbury line, (Aug. 1, 1849)	43 1/2
Total	478 1/2

Leased lines:	
Chester and Holyhead	80 1/2
Kendal and Windermere	9 1/2
Shrewsbury and Stafford	29 1/2
Preston and Carlisle	90
Preston and Parkside	22

Grand total.....710 miles.

The London and Northwestern railway is *par excellence* the great railway of the world. In addition to the lines owned and leased, it controls indirectly the traffic of some 400 miles in addition.

The returns of this company for the year ending June 30, 1849, show the following facts:

Number of engines in use	457
No. of miles run by passenger engines	4,649,556
“ freight	2,882,674
“ both classes	7,532,230
Average daily run of engine	45 miles.
Actual running of each engine per trip	90
Average speed of trains per hour	28
Passenger coaches owned—1st class	451
“ 2d class	116
“ 3d class	229

The company owned June 30th, 1849—

Box freight cars	6,395
Platform cars	228
Horse boxes	246

For the 12 months ending June 30, 1847, on 428 miles road, the tons of goods carried were 1,411,080

Average distance of each ton carried.....69 1/2 miles.

Average number of tons carried daily.....631

Number of passengers carried daily—1st class, 360

“ 2d class, 478

“ 3d class, 345

Average daily.....1183

Av. No. passengers to each engine—1st class, 14. 5.

“ 2d class, 19. 3.

“ 3d class, 14. 6.

Total.....48. 4.

Av. dist. travelled by pass.—1st class, 57. 6. miles.

“ 2d class, 31. 3.

“ 3d class, 23. 0.

Average distance.....32. 2.

An average of 1183 passengers carried 32. 2. mls. daily, is equal to 38,092 carried one mile. Assuming a business equal to 100 through passengers from Bangor to Canso each way daily, 400 miles, it is equal to 89,000 passengers daily, or more than twice the average travel on the London and Northwestern railway.

Add 100 daily passengers to the present business of the 383 miles of railway from Galway to London (allowing one half to stop short of London) and you add to the business of these roads an amount nearly equal to the average daily business of their lines.

Assuming the cost of a road from Bangor to Canso at \$30,000 per mile, and it requires a capital of \$12,000,000 to complete it. This would require a net income of \$720,000 to give a 6 per cent. dividend.

The through business alone, estimated 100 passengers a day each way, and the mail pay at \$300 per mile—the same now paid on 1st class roads in the United States—would be as follows:

200 passengers, 400 miles, at 3 cents per mile, is	
\$2,400 per day, annually producing	\$876,000
400 miles mail pay, \$300 per mile	120,000

Equal to.....\$996,000

The cost of running long through trains would be less than the average cost of ordinary roads in this country.

The cost of running trains on the Portland, Saco and Portsmouth railroad, has been accomplished at 42 cents per mile.

The average number of passengers per train in the United States is estimated at 54.

The average number of miles each passenger travels is estimated at 18 miles.

Assuming the cost of running trains at 50 cents a mile, on 800 miles daily, it would cost annually.....146,000

Leaving a net income for carrying 200 through passengers, with the mails, per day.....\$850,000

The freight and way business to be added to this estimate.

AMERICAN RAILROAD JOURNAL.

Saturday, July 13, 1850.

Bowling Iron. Stamped B.O.

Railway Fire Bars
Locomotive and other Axles
Boiler Plates
and every other description of this superior Iron.
The subscribers, agents for the sale of Bowling Iron, are prepared to execute orders for importation, especially for railway and machinery uses, with despatch from the manufacturers.

RAYMOND & FULLERTON, 45 Cliff st.

To our Subscribers.

The half year of the present volume of our paper has elapsed, and we should esteem it a favor on the part of our subscribers if they would forward the amount due for the current year. As they are widely scattered over the whole country, we cannot call upon them personally or by agent; and they will readily understand the favor done to us by forwarding the amount by mail.

Canada.*Toronto and Lake Simcoe Railroad.*

We see by the Canada papers that the people of Toronto have refused to subscribe to the stock of the above road. We expected a different result, as we supposed and still believe that the leading property holders of the town favored the subscription. The opposition came we believe mostly from what are termed the working classes, from the fear of adding to their taxes. This is exactly reversing the mode of doing things in this country. A person who possesses the least property is in fact the most interested in railways. They diminish the cost of all the necessities of life. They give employment where none existed before, and increase the rate of wages of those employed. They constitute the most powerful stimulant that can be applied to business, and if they increase taxation, they increase in a vastly greater ratio the means of those paying it.

Such is the history of their influence in this country without an exception. The railroad benefits the rich, but not in the same proportion nor in the same way. It increases the value of his property, but may not add to his luxuries or comforts. He says:—"I have got enough to live upon, and I do not wish to hazard it for the sake of getting more." Again, men are usually selfish in proportion as they are rich. They are to be sure desirous of increasing the value of their property by the construction of these works, but they wish other people to build them and run all the risk, while they reap the benefit. The rich never subscribe for these works so liberally in proportion to their means as those who possess only a competency, or a small amount of property. To make them subscribe, "to bring them up to the work," is one of the reasons given for subscriptions by counties and cities. In such cases as all are taxed in proportion to their property, all are thus made to subscribe in this indirect way in proportion to their means.

Our Canadian friends do not seem to appreciate the value of these works, as agents in the creation of wealth, or in promoting the growth of a country. So great is this influence, that the construction of a road by one town involves a necessity of their construction by all other towns which are any way its rivals, and purely as a matter of self defence, to enable them to maintain the same relative position that existed before the introduction of these works. So superior are the means of transportation and travel furnished by them over the old way, that

those constructing them are able to draw to themselves the business once shared between many others. No State affords a more complete and perfect illustration of this than Massachusetts. Boston, by virtue of superior enterprise and capital, first engaged in railroads. As soon as her leading lines were finished, she drew to herself the trade formerly shared in common with a great number of smaller towns. The trade of such places grew less and less, but happily they discovered the cause before it was too late to remedy the evil. All commenced the construction of works similar to those which had accomplished so much for Boston. Each New England seaport of over 6,000 inhabitants has now its railroad, and has by virtue of it, recovered the trade of its back country which it had lost, and these smaller towns are now showing from a similar cause, as great relative growth as ever Boston exhibited.

Now our Canada friends will be compelled to resort to the same means to maintain their position, and to enable them to keep pace with the growth of this country, that the people of the States have made use of. If they fail to do so, their stationary condition will, to those moving much more rapidly, have the appearance of retrocession. There is no alternative but to move one way or the other.—It may require some effort and labor, in fact it will require a vast deal of effort, labor and expenditure, and impose the disagreeable necessity of waking up from a state of inaction that habit has made agreeable; but such a course is one of the necessities imposed by the progress of the race, and any community that does not respond to the demands of the age shows itself wanting in the noblest attributes of our nature.

Lake Superior Copper Region.

Our readers will find an interesting communication in our present number from Mr. Hodge, who is spending the season in the copper region superintending the operations of some of the most important mines. We hope to hear from him often, as the interest attached to the mines of Lake Superior is second only to that felt for the gold mines of California. If the discovery of the latter form an era in gold mining, the former mark a no less important one in copper. We are happy to say that copper mining bids fair to become much more profitable, and is not attended by that loss of life and health which has pursued those seeking the more precious metal.

Antiquity of the Electric Telegraph.

In Arthur Young's Travels in France from 1787 to 1789, published at Bury St. Edmunds in 1792, we find the following passage, which clearly points out the discovery of the principle and the practice of the electric telegraph:—"In electricity he (M. Lomond) has made a remarkable discovery—you write two or three words on a paper, he takes it with him in a room, and turns a machine enclosed in a cylindrical case, at the top of which is an electrometer, a small fine pith ball; a wire connects with a similar cylinder and electrometer in a distant apartment, and his wife, by remarking the corresponding motions of the ball, writes down the words they indicate, from which it appears that he has formed an alphabet of motions. As the length of wire makes no difference in the effect, a correspondence might be carried on at any distance—within or without a besieged town, for instance, or for a purpose much more worthy and a thousand times more harmless, between two towns prohibited or prevented from any better connection."

Experiments with Galvanized Wire and Hemp Ropes.

Experiments have been tried in Woolwich Dockyard to ascertain the comparative strength of wire and hemp ropes. A wire rope, 3 inches round, and a hemp rope of 3 strands, hawser laid, common make, 7 inches round, were spliced together, and placed in the testing machine, and on the hydraulic power being applied the hemp rope broke in the middle on the strain reaching 11½ tons, the wire rope remaining apparently as strong as when the experiment commenced. A wire rope, 3½ inches round, was then spliced with an 8-inch hemp shroud rope, and on the power being applied the hemp rope broke in the middle with a strain of 10½ tons, the wire rope continuing apparently uninjured.

General Railroad Law of Canada.

We give in our present number the general railroad law of Canada, which secures the aid of the Provinces to railroad companies on certain conditions. It is a law in which our people are largely interested, as the leading roads of Canada must connect with our own, and as the public works there are largely carried on by contractors from the States.

Maryland.*Business of the Baltimore and Ohio Railroad.*

The following are memoranda of the business upon the Baltimore and Ohio railroad, for the month of June, 1850.

The transportation eastwardly into the city of Baltimore, on some of the principal staples has been as follows:

Bark	228 tons.
Coal	11,902 "
Fire brick	36 "
Flour	39,448 bbls.
Grain	221 tons.
Granite	820 "
Iron	518 "
Iron ore and manganese	257 "
Leather	75 "
Lime	3 "
4790 hogs	357 "
230 sheep	16 "
33 horses and mules	16 "
34 horned cattle	9 "
Meal and shorts	46 "
Tobacco	383 hds.
Whiskey	407 bbls.
Miscellaneous	201 tons.

The revenue for the month has been as follows:

Main Stem	\$29,768 15	\$82,484 20
Washington Branch	21,168 03	6,027 59
	\$50,936 18	\$88,511 79

Making an aggregate of \$112,252 35 on the Main Stem, and \$27,195 62 on the Washington Branch—the total being \$139,447 97.

The above shows an increase over the corresponding month of last year of \$15,542 13 on the Main Stem, and \$4,986 43 on the Washington Branch—making an aggregate increase on both roads of \$20,528 56.

Tennessee.

Nashville and Chattanooga Railroad.—The whole of this road we learn is now under contract.

The Alp Tunnel.

Its northern entrance is to be at Modane, the southern at Bardonnèche, on the Mardovine. The latter entrance, being the highest point of the line, will be 4092 feet above the level of the sea, and yet 2400 feet below the culminating point of the great mass over Mont Cenis. The connecting lines leading to either entrance of the tunnel will be eight inclined planes of about 5000 metres, or 2½

English miles, each, worked like those at Leige, by endless cables and stationary engines, but moved by water power from the torrents. The tunnel itself will measure 12,260 metres, or nearly seven English miles in length; its greatest height will be 19 feet, and its width 25. A most remarkable part of the project is the newly devised machinery and motive power by which the Chevalier Maus proposes to bore it. This machinery is said to be as ingenious as it is new, presenting, as a correspondent of the Times states, some extraordinary facts in mechanics which could hardly have been anticipated. In comparison with such a gigantic undertaking as this, the Thames tunnel and the Britannia bridge become secondary objects. An application for funds to begin with will be made to the Piedmontese Parliament forthwith, and the work, which it is expected will occupy five years, will cost 14,000,000*f.*; while the entire railway of the Alps, connecting the tunnel with the Chambery railway on the one side, and with that of Susa on the other side (in length together 36,565 metres, or 20½ English miles) will cost 21,000,000*f.* more, forming a total expense of 35,000,000*f.*

Railroad Celebration at Burlington.

The railroad fraternity of New England have recently had a grand jubilee at Burlington, Vermont. Judge Follett, President of the Rutland road, was President of the day. Speeches were made by Judge Follett, Governor Paine, Josiah Quincy, Jr., and Col. Schouler, of Boston, Mr. Crocker, of Fitchburg, Gen. Low, of Concord, and by others.

On the same day there was an Editorial meeting, which was attended by a goodly number of gentlemen connected with the Press, from New England and New York. Gen. Clark, of the Burlington Free Press, called the meeting to order, when Col. Schouler, of the Boston Atlas, was chosen President, and Mr. Butterfield of the New Hampshire Patriot, and H. J. Hastings of the Albany Knickerbocker, Secretaries.

Gen. Clark represented the object of the meeting to be to cultivate a friendly feeling amongst those engaged in the same important calling, and "to have a good time." Numerous speeches were made, abounding in anecdote and witicism, which gave much life and glee to the occasion. Mirth-making and laughter were decidedly in the ascendant during the whole time.

Canada.

Great Western Railway.—Our readers will be pleased to learn that an arrangement is on the point of being effected by which we shall effectually get rid of the opposition of the rival road, and secure, we trust, the immediate prosecution of a work in which the whole country is interested.

The basis of the compromise are briefly as follows: The projectors of what we have called the frontier line, may unite with the Great Western at any point within twenty miles of Brantford (westward) and construct their branch to Bertie; but the whole of the grading is to be completed by the 1st of January, 1852, or the charter expires.

The Great Western to retain their present line, and grade fifty miles of the road immediately adjoining (westward) the point to which the Bertie people proceed.

In June, 1853, the Great Western company are to complete the grading of the whole line from Hamilton to Windsor.

In default, the frontier company are to take pos-

session of the surveyed route of the Great Western company, and complete the road, on paying to the Great Western company any expenses which they have incurred, and may incur.

These are the terms of the compromise, and we are certain our Hamilton and Western readers will be perfectly satisfied with it. The Great Western company are to have all that they contended for, while the frontier people are bound to build a branch to the Niagara river, or abandon their pretensions.

We have now but to go to work with vigor and a determination to build the road.

The bill to enable municipalities to take stock in the Great Western railway, as slightly amended in the Council, was agreed to by the House on Thursday evening.—*Hamilton Spectator.*

South Carolina.

South Carolina Railroad—Reduction of Freights.

—We would call attention to the new tariff of rates of the South Carolina railroad company, between Charleston and Hamburg and Augusta, to go into effect on and after this day. It will be perceived that freights have been materially reduced on many leading articles, especially groceries and other heavy goods. On sugar, coffee, iron, nails and other articles in the fourth class, the freight to Hamburg is reduced to 15 cents per 100 lbs. and articles in the second class to 20 cents; while salt, molasses, pipes, hogsheads and barrels, and many other specific articles are reduced in a corresponding ratio.—*Charleston Mercury.*

Georgia Railroads.

We copy the following from the Savannah Republican relative to the roads in Georgia:

The Central Road.—In addition to the iron already ordered for this road, much of which is laid down, one thousand tons more of a beautiful and massive T rail have just been ordered. More iron will be purchased from time to time, so as to continue the process of reconstruction, as rapidly as the wants of the road and a sound economy shall dictate.

The Milledgeville and Gordon Road.—Mr. Demming, the President of this road, has taken hold of its affairs with energy, perseverance and sound forethought. After procuring some \$25,000 additional subscriptions at Milledgeville and in its vicinity, he has come to Savannah to obtain the residue sufficient to insure its construction. We are happy to announce that he has succeeded in his object. Our banks have advanced the money required, receiving the bonds of the corporation of Milledgeville as security. Its construction is now placed beyond contingency, and it will be completed in one year from the first of September next.

Macon and Western Railroad.—We learn from an authentic source that the Macon and Western railroad is to receive forthwith a new and heavy T rail throughout its entire length. Our readers will doubtless remember that twenty-five miles of new iron was procured for this road some time since. The iron is nearly all laid down, and the new order is for iron enough to relay all the rest of the track. This new supply is to be delivered at this port at \$39.50 per ton. The whole is to be laid down on cross-ties near together, without the longitudinal stringer, which system, with the rail adopted, will place the Macon and Western on a par with the best class of American roads. When the track is re-laid, it is expected to measure the distance with passenger trains between Atlanta and Macon in three and a half hours, including stop-

pages, of course. This will leave to the Central road seven or seven and a half hours for its one hundred and ninety-one miles, including stoppages, and one hour to stop at Macon—the whole distance from Savannah to Atlanta being thus accomplished with great ease in less than twelve hours.

Commerce of New York.

Imports, year ending June 30th 1850.

	Dutiable.	Free.	Specie.	Total.
July,	\$8,469,423	537,803	327,007	9,334,233
Aug.	13,061,344	707,633	60,739	13,829,716
Sept.	7,887,190	226,188	489,435	8,602,813
Oct.	5,888,881	165,303	572,614	6,626,798
Nov.	4,548,056	429,251	533,715	5,511,022
Dec.	4,407,715	362,858	1,381,824	6,152,397
Jan.	11,446,496	437,270	433,882	12,317,648
Feb.	7,723,961	662,993	581,362	8,968,316
Mar.	8,149,821	1,364,182	907,634	10,421,637
April,	9,311,661	1,674,330	1,095,598	12,081,589
May,	8,235,872	608,216	2,883,623	11,727,711
June,	9,229,205	514,851	1,234,682	7,978,738

\$95,359,625 7,890,878 10,502,115 113,752,618

Exports, year ending June 30th 1850.

	Dutiable.	Free.	Specie.	Total.
July,	\$2,953,630	419,979	138,352	3,511,961
August,	1,965,113	343,704	359,368	2,668,185
September,	1,808,500	446,895	326,384	2,581,779
October,	1,746,739	393,189	1,830,518	3,970,446
November,	3,684,087	309,963	634,898	4,628,948
December,	2,062,734	638,342	141,973	2,843,049
January,	2,223,910	946,981	90,161	3,261,052
February,	3,188,994	324,395	278,786	3,792,175
March,	2,865,634	270,310	172,087	3,308,031
April,	3,146,151	499,971	290,407	3,936,529
May,	3,610,977	346,632	741,735	4,699,344
June,	3,971,207	494,380	880,434	5,346,021

\$33,227,676 5,433,841 5,885,103 44,546,620

The following is a similar statement for the previous year:

Imports, year ending June 30th 1849.

	Dutiable.	Free.	Specie.	Total.
July,	\$7,046,389	650,055	64,631	7,761,075
Aug.	9,796,778	1,128,555	134,855	11,061,188
Sept.	8,168,294	513,719	197,098	8,879,111
Oct.	5,136,332	439,587	127,998	5,703,917
Nov.	4,518,565	185,970	104,971	4,809,506
Dec.	3,251,940	283,755	70,188	3,606,183
Jan.	7,833,710	525,534	57,700	8,416,944
Feb.	8,257,786	285,117	21,323	8,564,226
March,	7,298,470	591,849	130,895	8,021,214
April,	5,808,158	2,192,798	638,746	8,639,702
May,	5,779,628	687,180	1,137,932	7,604,740
June,	5,057,273	344,430	122,713	5,524,416

\$78,583,323 8,028,579 2,813,380 89,425,282

Exports, year ending June 30th 1849.

	Dutiable.	Free.	Specie.	Total.
July,	\$2,139,125	112,479	744,983	2,996,587
August,	2,230,909	189,206	331,031	2,751,146
September,	2,926,213	217,267	561,445	3,704,925
October,	3,576,051	246,713	882,425	4,705,189
November,	3,695,287	201,378	482,185	4,378,851
December,	2,616,787	407,265	305,878	3,329,930
January,	2,109,059	152,590	282,582	2,544,237
February,	2,190,649	351,378	105,851	2,647,878
March,	2,687,803	330,591	86,506	3,104,900
April,	2,655,819	347,135	85,691	3,088,645
May,	3,020,861	551,991	373,916	3,946,768
June,	3,317,740	445,892	536,411	4,300,043

\$33,166,339 3,553,885 4,739,903 41,460,127

RECAPITULATION.

We annex the recapitulation of the totals, with the addition of the two years next preceding the above.

Imports of Four Years.

	Dutiable.	Free.	Specie.	Total.
1850,	\$95,359,625	7,890,878	10,502,115	113,752,618
1849,	78,583,323	8,028,579	2,813,380	89,425,282
1848,	82,312,451	8,183,026	1,173,405	91,668,883
1847,	65,203,532	9,082,713	8,307,330	82,593,625

Exports of Four Years.

	Domestic.	Foreign.	Specie.	Total.
1850,	\$33,227,676	5,433,841	5,885,103	44,546,620
1849,	33,166,339	3,553,885	4,739,903	41,460,127
1848,	33,637,844	2,693,597	12,028,794	48,360,235
1847,	43,021,322	2,616,572	905,841	46,543,735

North Carolina.**Wilmington and Roanoke Railroad.**

Something like sixty miles of the railroad, more than one-third of its extent, have been relaid with the heavy T iron now being imported by the company. The larger portion of the relaid track is on the lower half of the road, between this and Goldsboro'. The workmen are going on with the relaying with all practicable dispatch. Two fine 8 wheeled passenger cars for the road have just been turned out of the company's car shop here. They are "home-made" throughout.

Indiana.

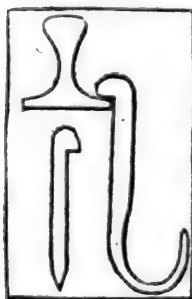
Union Track.—The Union track running around the east and south sides of Indianapolis, connecting the four railroads that have been located to that place together, is now finished, and the locomotives and cars are daily passing from the Madison road over the track with rock for the bridge over White river for the Terre Haute road, and with lumber and iron for the Bellefontaine road.

Terre Haute Road.—The company are prosecuting the grade of this road with energy. They purpose completing the entire grading and bridging this season, from Indianapolis to Terre Haute, preparatory to laying the iron next year.

Peru and Indianapolis Road.—The superstructure of this road is now being laid from the north end of the Union track, and the company expect to have the road in use to Noblesville this season, and to contract for the clearing off of the timber and grubbing the balance of the line to Peru.

Lafayette and Indianapolis Road.—The Lafayette Journal says that there is a better prospect of the completion of this road than has been anticipated for some time past. The directors were in session on the 11th ult., and resolved to go on with the grading of the road from Lebanon to Indianapolis, the letting of which will be given out in the course of two or three months.

Patent Self-clinching Railroad Spikes.



These spikes have been in use upon various roads for several years, and have met with universal approval by Engineers. They drive in the manner shown, turning themselves, and are therefore not liable to work loose. They will prove of great value to secure the chair.

We are also manufacturing railroad spikes, hook and flat head; wrought chairs, clamps, etc., of superior quality, and are prepared to contract for any pattern or weight upon favorable terms.

SMITH & TYSON,
25 South Charles st., Baltimore Md.

NORRIS' LOCOMOTIVE WORKS, SCHENECTADY, N. Y.

THESE Works are in full operation in Manufacturing to order, Locomotive Steam Engines & Tenders, of the best principle and construction of material, using wrought iron heavy frames with pedestals welded thereto, and all parts of the engine made of the best wrought iron, except cylinders, pumps and boxes—obtaining greater durability, and carrying less weight over the road, than engines constructed of cast iron.

Wrought Iron Tires made any required size, and Tire Bars bent and welded with dispatch.

Chilled Wheels for Cars, Trucks and Tenders, made from the toughest iron.

Driving and Tender and Car Wheels fitted to Axles with Brass Boxes and Springs, and Railroad Machinery generally. Manufactured and for sale by

April 11, 1849.

E. S. NORRIS.

Ray's Patent India Rubber Car Springs.

Savannah, Ga., May 22, 1850.

FOWLER M. RAY, Esq.,

Dear Sir: I have no hesitation in saying, after having used on our road your springs and Fuller's, that I consider yours decidedly the best in every particular, and in this opinion I am sustained by all our officers. Fuller's spring has a tendency to split, and also to chafe or abrade by the constant friction on the cast iron plates or disc: and in my opinion is not near so elastic as yours.

Your springs, which have been in use on our road for 12 or 15 months past, and in constant use under both passenger and freight cars, are to all appearances as elastic, sound and good, as when first put in use.

We are now building eighty-five new cars, of which for fifty-sets the springs have been ordered of you.

GEORGE A. ADAMS,

Master Carpenter,

Central Railroad and Banking Co. of Georgia.

Connecticut River Railroad Office, }
Northampton, May 4, 1850. }

E. CRANE, Esq.,

Dear Sir: It is now about two years since I first tried the experiment of using a set of Ray's India-rubber Springs upon one of our merchandise cars, and although the car has been in constant service since that time, I do not on examination find the slightest difference either in the thickness or elasticity of the material.

The same result has followed wherever we have applied them, either for wheel or draw springs on Engines, Tenders or Cars. At present we use no other; either in replacing old springs or building new cars—and I am perfectly satisfied that for economy, durability, safety, and ease of motion, that Ray's India-rubber is the best article for Springs which has been presented to the public.

Yours respectfully, J. HUNT,
Supt. Connecticut River Railroad.

EDWARD CRANE, Esq.,

Dear Sir: Having applied to cars of the Boston and Worcester Railroad Corporation, Ray's Vulcanized Rubber Springs (where they have been in use for some two years last past), I have had occasion to observe their operation, and am free to say in answer to your inquiries, that they retain their elasticity perfectly during all changes of atmospheric temperature; and are in my opinion a most valuable acquisition to Railroad Cars—are not liable to derangement, as is the case with steel springs; while at the same time it costs less to apply them. Respectfully yours,

D. N. PICKERING,

Supt. Motive Power, Bost. & Wor. Railroad.
Boston, April 15th, 1850.



NORTHERN RAILROAD, NEW YORK.

CARS run between Rouses Point and Chateaugay daily, Sundays excepted, as follows:

Leave Rouses Point at . . . 3 1/2 A.M.
Leave Chateaugay at . . . 6 1/2 P.M.

On the arrival of the cars at Chateaugay, stages are in readiness to take the passengers to Ogdensburg, where they arrive the same day.

Passengers leave Ogdensburg in the morning by stage, and take the evening train from Chateaugay to Rouses Point, where they go immediately on board the steamboats which run north and south on Lake Champlain.

Passengers leaving New York in the evening by the way of Whitehall, will arrive at Rouses Point the next night, and the next morning pass directly from the boat to the cars, and arrive at Ogdensburg the same day. CHARLES L. SCHLATTER, Supt.

Ibbotson, Brothers & Co's CELEBRATED CAST STEEL

AND

Best Cast Steel Royal Improved Files, well known as better adapted for Engineers' and Machinists' purposes than any now in use in the United States.

Every description of Square, Octagon, Flat and Round Cast Steel, Sheet, Shovel and Railway Spring Steel, etc., and Steel to order for any purposes—manufactured at their works in Sheffield—and universally known by the old stamp "Globe."

HENRY J. IBBOTSON, Agent,
218 Pearl st., New York.

NOTICE.

A young man of experience in Surveying wishes a situation on a Railroad as an Assistant. Please apply at this office.

Election of an Engineer.

At a Meeting of the Board of Directors of the Virginia Central Railroad Co. at Charlottesville on the 4th day of June, 1850.

Resolved, That the election of a Chief Engineer in the place of Wm. A. Kuper, whose resignation has been accepted, is postponed to take place in Richmond on Tuesday the 18th of June instant.

A copy from the minutes.

JOHN GARRET, Secretary.

Lovegrove's Patent Cast Iron Water and Gas Pipes.

THE Subscriber, the Inventor and Patentee of the Centrifugal mode of giving form to metallic substances while in a molten state, is preparing to make Cast Iron Water and Gas Pipes, of any dimensions, at prices much lower than they can be made in the old manner, and the pipes warranted to stand a pressure of three hundred pounds to the square inch, and to be soft enough to drill. Steam Engines and all kinds of machinery. Cast Iron Doors and Frames, and Mill Castings of every description, made to order.

THOMAS LOVEGROVE,

Machinist and Founder,

West Falls Avenue, below Pratt st., Baltimore.

American Railway Guide, AND POCKET COMPANION FOR THE UNITED STATES;

CONTAINING Correct Tables, showing the time for starting of trains from all stations, distances, fares, etc., on all the Railway lines in the U. States; also many of the principal Steamboat and Stage routes—accompanied by a complete RAILWAY MAP. Price, single copies 12 1/2 cts., & \$1 per annum. Published on the first of every month, corrected from returns furnished by the Railway Superintendents throughout the Union.

This book has been compiled somewhat on the plan of Bradshaw's Guide, with such improvements in size, form and arrangement as have seemed desirable; and the publisher confidently hopes it will not be found liable to the objections of incompleteness and incorrectness, which have been made, and justly too, against various other similar works heretofore issued.

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N.B.—With the present (6th) part, are given specimen Plates of the APPENDIX, (or "THEORETICAL AND PRACTICAL TREATISE ON BRIDGE BUILDING, etc. etc.") consisting of plans, elevations, sections and details of a cast iron oblique arch, 130 feet span, across Fairfield at Manchester, on the line of the Manchester and Birmingham Railroad. Also a specimen sheet of the letter press of the APPENDIX, consisting of an introductory article on the *Application of Iron to Railroad Structures*.

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In connection with this subject (Iron Railroad Structures) we take occasion to call attention again to Mr. Duggan's valuable and expensive publication, exhibiting drawings, with full descriptions of the various stone, iron and wooden bridges, viaducts, tunnels, culverts, etc., of all the Railroads in the United States. Mr. Duggan is an accomplished Architect and Civil Engineer, who came from Ireland to this country to exercise his profession; but finding Railroad construction here, in many respects, different from that he had been accustomed to in Europe, he applied himself to the study of our system; and the fruits of his researches and investigations embodied in this work, are well calculated to meet the exigencies of engineers, and to assist draughtsmen, bridge builders, mechanics and students.—[N. Y. Journal of Commerce, Feb. 14, 1850.]

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ISAAC ABBATT, Secretary. 3m9

NOTICE TO**Superintendents of Railroads.**

TYLER'S PATENT SAFETY SWITCH.—The undersigned would respectfully call their attention to his Patent Safety Switch, which from long trial and late severe tests has proved itself perfectly reliable for the purpose for which it was intended. It is designed to prevent the train from running off when the switch is set to the wrong track by design or accident. The single rail or gate switch is established as the best and safest switch for the ordinary purpose of shifting cars from one track to another, but it is liable to the serious evil of having one track open or broken when connected with the other. My improvement entirely removes this evil, and while it accomplishes this important office, leaves the switch in its original simplicity and perfection of a plain unbroken rail, connecting one track with the other ready for use.

The following decision of the Commissioner of Patents is respectfully submitted to Railroad Engineers, Superintendents, and all others interested in the subject.

P. B. TYLER.

(COPY.)

UNITED STATES PATENT OFFICE, }

Washington City, D.C., April 28th, 1846.

SIR: You are hereby informed that in the case of the interference between your claims and those of Gustavus A. Nicolls, for improvements in safety switches—upon which a hearing was appointed to take place on the 3d Monday in March, 1846, the question of priority of invention has been decided in your favor. Inclosed is a copy of the decision. The testimony in the case is now open to the inspection of those concerned.

Yours respectfully,
EDMUND BURKE,
Commissioner of Patents.

To Philos B. Tyler.

Any further information may be obtained by addressing P. B. TYLER, Springfield, Mass., or JOHN PENDLETON, Agent, 149 Hudson St., New York.

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May 12, 1849.

1m19

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Philadelphia, June 16, 1849. 1y25

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IRON Founders, Portable Steam Engine Builders and Boiler Makers, Corner Front and Plewman Sts., near Baltimore St. Bridge,

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All kinds of machinery made to order. Steam Generators, Force Pumps, Wrought Iron Pipes and Fittings for Steam, Water, Gas, etc., constantly on hand, Baltimore, June 6, 1849.

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Berrien, John M.,

Michigan Central Railroad, Marshall, Mich.

Buckland, George,

Troy and Greenbush Railroad.

Clement, Wm. H.,

Little Miami Railroad, Cincinnati, Ohio.

Cozzens, W. H.,

Engineer and Surveyor, St. Louis, Mo.

Alfred W. Craven,

Chief Engineer Croton Aqueduct, New York.

Davidson, M. O.,

Eckhart Mines, Alleghany Co., Maryland.

Fisk, Charles B.,

Cumberland and Ohio Canal, Washington, D. C.

Felton, S. M.,

Fitchburg Railroad, Boston, Mass.

Floyd-Jones, Charles,

South Oyster Bay, L. I.

Gzowski, Mr.,

St. Lawrence & Atlantic Railroad, Montreal, Canada.

Gilbert, Wm. B.,

Rutland and Burlington Railroad, Rutland, Vt.

Grant, James H.,

Nashville and Chattanooga R. R., Nashville, Tenn.

S. W. Hill,

Mining Engineer and Surveyor, Eagle River, Lake Superior.

Holcomb, F. P.

Southwestern Railroad, Macon, Ga.

Johnson, Edwin F.

New York and Boston Railroad, Middletown Ct.

Latrobe, B. H.,

Baltimore and Ohio Railroad, Baltimore, Md.

Miller, J. F.,

Worcester and Nashua Railroad, Worcester, Mass.

Morris, Elwood,

Schnykill Navigation, Schuylkill Haven, Pa.

Morton, A. C.,

Atlantic and St. Lawrence Railroad, Portland, Me.

McRae, John,

South Carolina Railroad, Charleston, S. C.

Nott, Samuel,

Lawrence and Manchester Railroad, Boston.

Prichard, M. B.,

East Tennessee and Georgia R. R., Cleveland, Tenn.

Roebling, John A.,

Trenton, N. J.

W. Milnor Roberts,

Bellefontaine and Indiana Railroad, Marion, Ohio.

Roberts, Solomon W.,

Ohio and Pennsylvania Railroad, Pittsburgh, Pa.

Sanford, C. O.,

South Side Railroad, Virginia.

Schlatter, Charles L.,

Northern Railroad (Ogdensburg), Malone, N. Y.

Sours, Peter,

Rahway, New Jersey.

Stark, George.,

Bost., Con. and Mont. R. R., Meredith Bridge, N. H.

Steele, J. Dutton,

Pottstown, Pa.

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Tinkham, A. W.,

United States Fort, Bucksport, Me.

Thomson, J. Edgar.,

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Troost, Lewis,

Alabama and Tennessee Railroad, Selma, Ala.

Whipple, S.,

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Williams, E. P.,

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Lewis Bullard, Esq., Boston.

February 9, 1850.

6m*

United States Railroad Guide and Steamboat Journal.

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3m

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SAFETY AND ECONOMY.****NORRIS' LOCOMOTIVE WORKS,
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November 23, 1849.

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ROPE AND CABLES,**For Inclined Planes, Suspension Bridges, Standing
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SCHOOL OF CHEMISTRY.****IRON.****Railroad Iron.****3,000 TONS C. L. MAKE 63** lbs. per yard,
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are yearly furnished for railroad purposes, and wher-
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promptitude, at reasonable prices, and the quality war-
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Albany Iron and Nail Works.**Railroad Iron.**THE Undersigned, Agents for Manufacturers, are
prepared to contract to deliver Rails of superior
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charge in the United States.**COLLINS, VOSE & CO.,**

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Iron, Spring and Blistered Steel, Nail Rods, Best Re-
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Castings, Cast Iron Pipes of all sizes, Railway Chairs**
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IRONDALE PIG METAL, MANUFACTURED

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livery of Foreign rails, of approved brands upon the
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made at their Trenton works, from Andover Iron, in
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Market Wire; Braziers and Wire Rods; Rivets and
Merchant Bars to order, all made exclusively from An-
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of the very best quality for special purposes, is respect-
fully invited.**COOPER & HEWITT,**

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February 15, 1850.**Glendon Refined Iron.**Round Iron, Band Iron, Hoop Iron,
Square " Flat " Scroll "Axles, Locomotive Tyres,
Manufactured at the Glendon Mills, East Boston, for
sale by **GEORGE GARDNER & CO.,**

5 Liberty Square, Boston, Mass.

Sept. 15, 1849.

3m37

**PATENT HAMMERED RAILROAD, SHIP &
BOAT SPIKES.**—The Albany Iron Works
have always on hand, of their own manufacture, a
large assortment of Railroad, Ship and Boat Spikes
from 2 to 12 inches in length, and of any form of head
From the excellence of the material always used in
their manufacture, and their very general use for rail-
roads and other purposes in this country, the manu-
facturers have no hesitation in warranting them fully
equal to the best spikes in market, both as to quality
and appearance. All orders addressed to the subscrib-
ers at the works will be promptly executed.**JOHN F. WINSLOW, Agent.**Albany Iron and Nail Works, Troy, N. Y.
The above Spikes may be had at the following prices, @
Erastus Corning & Co Albany; Merrill & Co., New
York; E. Pratt & Br: 1st, Eastmore Md**LAP—WELDED
WROUGHT IRON TUBES**

FOR

**TUBULAR BOILERS,
FROM ONE AND A QUARTER TO SEVEN
INCHES IN DIAMETER.**THE ONLY Tubes of the same quality and man-
ufacture as those so extensively used in England,
Scotland, France and Germany, for Locomotive, Ma-
rine and other Steam Engine Boilers.**THOMAS PROSSER & SON, Patentees,**
23 Platt street, New York.**Railroad Iron.**THE UNDERSIGNED ARE PREPARED TO
contract for the delivery of English Railroad Iron
of favorite brands, during the Spring. They also re-
ceive orders for the importation of Pig, Bar, Sheet, etc.
Iron.**THOMAS B. SANDS & CO.,**

22 South William street,

February 3, 1849.

New York.

Iron Store.THE Subscribers, having the selling agency of the
following named Rolling Mills, viz: Norristown,
Rough and Ready, Kensington, Triadelphia, Potts-
grove and Thorndale, can supply Railroad Companies,
Merchants and others, at the wholesale mill prices for
bars of all sizes, sheets cut to order as large as 58 in.
diameter; Railroad Iron, domestic and foreign; Loco-
motive tire welded to given size; Chairs and Spikes;
Iron for shunting, locomotive and general machinery
purposes; Cast, Shear, Blister and Spring Steel; Bol-
ter rivets; Copper; Pig iron, etc., etc.**MORRIS, JONES & CO.,**

Iron Merchants,

Schuylkill 7th and Market Sts., Philadelphia.

August 16, 1849.

ly33

Railroad Iron.THE MOUNT SAVAGE IRON WORKS, AL-
legany county, Maryland, having recently pass-
ed into the hands of new proprietors, are now prepar-
ed, with increased facilities, to execute orders for any
of the various patterns of Railroad Iron. Communi-
cations addressed to either of the subscribers will have
prompt attention. **J. F. WINSLOW, President**

Troy, N. Y.

ERASTUS CORNING, Albany**WARREN DELANO, Jr., N. Y.****JOHN M. FORBES, Boston.****ENOCH PRATT, Baltimore, Md.**

November 6, 1848.

Railroad Iron.THE SUBSCRIBERS ARE PREPARED TO
take orders for Railroad Iron to be made at their
Phoenix Iron Works, situated on the Schuylkill Riv-
er, near this city, and at their Safe Harbor Iron Works,
situated in Lancaster County, on the Susquehanna
river; which two establishments are now turning out
upwards of 1800 tons of finished rails per month.Companies desirous of contracting will be promptly
supplied with rails of any required pattern, and of the
very best quality.**REEVES, BUCK & CO.**

45 North Water St. Philadelphia,

March 15, 1849.

Monument Foundry.

A. & W. DENMEAD & SON,
Corner of North and Monument Sts.,—Baltimore.

HAVING THEIR

IRON FOUNDRY AND MACHINE SHOP

In complete operation, are prepared to execute faithfully and promptly, orders for Locomotive or Stationary Steam Engines, Woolen, Cotton, Flour, Rice, Sugar Grist, or Saw Mills,

Slide, Hand or Chuck Lathes, Machinery for cutting all kinds of Gearing. Hydraulic, Tobacco and other Presses, Car and Locomotive patent Ring Wheels, warranted,

Bridge and Mill Castings of every description, Gas and Water Pipes of all sizes, warranted, Railroad Wheels with best faggoted axle, furnished and fitted up for use, complete

Being provided with Heavy Lathes for Boring and Turning Screws, Cylinders, etc., we can furnish them of any pitch, length or pattern.

Old Machinery Renewed or Repaired—and Estimates for Work in any part of the United States furnished at short notice.

June 8, 1849.

Iron Wire.

REFINED IRON WIRE OF ALL KINDS, Card, Reed, Cotton-flyer, Annealed, Broom, Buckle, and Spring Wire. Also all kinds of Round, Flat or Oval Wire, best adapted to various machine purposes, annealed and tempered, straightened and cut any length, manufactured and sold by

ICHABOD WASHBURN.

Worcester, Mass., May 25, 1849.

American and Foreign Iron.

FOR SALE,

300 Tons A 1, Iron Dale Foundry Iron.

100 " 1, " " "

100 " 2, " " "

100 " " Forge " "

400 " Wilkesbarre " "

100 " "Roaring Run" Foundry Iron.

300 " Fort " " "

50 " Catoctin " " "

250 " Chikiswalungo " " "

50 " "Columbia" "chilling" iron, a very superior article for car wheels.

75 " "Columbia" refined boiler blooms.

30 " 1 x 1/2 Slit iron.

50 " Best Penna. boiler iron.

50 " "Puddled" " "

50 " Bagnall & Sons refined bar iron.

50 " Common bar iron.

Locomotive and other boiler iron furnished to order.

GOODHUE & CO.,

New York.

64 South street

American Pig, Bloom and Boiler Iron.

HENRY THOMPSON & SON,

No 57 South Gay St., Baltimore, Md.,

Offer for sale Hot Blast Charcoal Pig Iron made at the Catoctin (Maryland), and Taylor (Virginia), Furnaces; Cold Blast Charcoal Pig Iron from the Cloverdale and Catawba, Va., Furnaces, suitable for Wheels or Machinery requiring extra strength; also Boiler and Flue Iron from the mills of Edge & Hilles in Delaware, and best quality Boiler Blooms made from Cold Blast Pig Iron at the Shenandoah Works, Va. The productions of the above establishments can always be had at the lowest market price for approved paper.

American Pig Iron of other brands, and Rolled and Hammered Bar Iron furnished at lowest prices. Agents for Watson's Perth Amboy Fire Bricks, and Rich & Cos. New York Salamander Iron Chests.

Baltimore, June 14, 1849.

6 mos

Wheel, Forge and Foundry Iron.

LOCUST GROVE Wheel Iron of great strength and superior chilling property.

Balt. Charcoal Forge Iron, from Patuxent, Curtis Creek and Gunpowder furnaces.

Elkridge Foundry Iron, of superior strength and softness. Anthracite and Charcoal Iron from Pennsylvania and Virginia. Gas and Water Pipes, Lamp Posts from Elkridge furnace.

LEMMON & GLENN,

6m9

62 Buchanan's Wharf, Baltimore.

Iron.

THE SUBSCRIBERS having resumed the agency of the New-Jersey Iron Company, are prepared to execute orders for the different kinds and sizes of Iron usually made at the works of the company, and offer for sale on advantageous terms.—

150 tons No. 1 Boonton Foundry Pig Iron.

100 " No. 2 do. do. do.

300 " Nos. 2 & 3 Forge do. do.

100 " No. 2 Glendon do. do.

140 " Nos. 2 & 3 Lehigh Crane do do.

100 " No. 1 Pompton Charcoal do.

100 " New-Jersey Blooms

50 " New-Jersey Faggoting Iron, for shafts

Best Bars, 1/2 to 4 inch by 1/2 to 1 inch thick.

Do do Rounds and Squares, 1/2 to 3 inch.

Rounds and Squares, 3-16 to 1 inch.

Half Rounds, 1/2 to 1 in. Ovals & Half Ovals 1/2 to 1 1/2 in.

Bands, 1/2 to 4 inch. Hoops, 1/2 to 2 inch.

Trunk Hoops, 1/2 to 1 1/2 in. Horse Shoe & Nut Iron.

Nail Plates. Railroad Spikes.

DUDLEY B. FULLER & Co., 139 Greenwich-

st. and 85 Broad-st.

WILLIAM JESSOP & SONS' CELEBRATED CAST-STEEL

The subscribers have on hand, and are constantly receiving from their manufactory,

PARK WORKS, SHEFFIELD,

Double Refined Cast Steel—square, flat and octagon.

Best warranted Cast Steel—square, flat and octagon.

Best double and single Shear Steel—warranted.

Machinery Steel—round.

Best and 2d gy. Sheet Steel—for saws and other purposes.

German Steel—flat and square, "W. I. & S." "Eagle"

and "Goat" stamps.

Genuine "Sykes," L. Blister Steel.

Best English Blister Steel, etc., etc., etc.

All of which are offered for sale on the most favorable terms by

WM. JESSOP & SONS,

91 John street, New York.

Also by their Agents—

Curtis & Hand, 47 Commerce street, Philadelphia.

Alex'r Fullerton & Co., 119 Milk street, Boston.

Stickney & Beatty, South Charles street, Baltimore.

May 6, 1848.

JOHNSON, CAMMELL & Co's Celebrated Cast Steel,

AND

ENGINEERING AND MACHINE FILES,

which for quality and adaptation to mechanical uses,

have been proved superior to any in the United States.

Every description of square, octagon, flat and round

cast steel, sheet, shovel and railway spring steel, best

double and single shear steel, German steel, flat and

square, goat stamps, etc. Saw and file steel, and steel

to order for any purposes, manufactured at their Cy-

clope Steel Works Sheffield.

JOHNSON, CAMMELL & CO.,

100 William St., New York.

November 23 1849.

Railroad Iron.

OF ANY PATTERN AND WEIGHT,

Of a Favorite Brand,

And deliverable in Bond, or Duty paid, at any Port of

the U. S., contracted for on favorable terms, by

CHARLES ILLIUS,

20 Beaver St., New York.

Pig and other Iron also contracted for. Sole Agent

for "Barter's Machine and Burning Oil"—particularly

adapted for "Railroads" and other Machinery—

Preferred to Sperm by the many now using it, and 25

per cent. cheaper.

CUT NAILS OF BEST QUALITY, BAR IRON

(including Flat Rails) manufactured and for sale

by **FISHER, MORGAN & CO.,**

75 N. Water St., Philadelphia.

Ogden & Martin's ROSENDALE CEMENT.

WE are prepared to enter into arrangements for supplying our Cement for public works or other

purposes. We warrant the cement equal in every respect to any manufactured in this country. It attains a great degree of hardness, sets immediately under

water, and is a superior article for masonry coming in contact with water, or requiring great strength.

For sale in tight barrels, well papered, at their office by **OGDEN & MARTIN,** 104 Wall st.

February 16, 1850.

ly*

The above cement is used in most of the fortifications building by government.

To Steam Engine Builders.

THE Undersigned offer for sale, at less than half its cost, the following new machinery, calculated for an engine of 62 inches cylinder and 10 feet stroke, viz.

2 Wrought Iron Cranks, 60 inches from centre to

centre.

1 Do. do. Connecting Rod Strap.

2 Do. do. Crank Pins.

1 Eccentric Strap.

1 Diagonal Link with Brasses.

1 Cast Iron Lever Beam (forked).

The above machinery was made at the West Point Foundry for the U. S. Steamer Missouri, without regard to expense, is all finished complete for putting together, and has never been used. Drawings of the cranks can be seen on application to

HENRY THOMPSON & SON,

No. 57 South Gay St., Baltimore, Md.

Sept. 12, 1849.

8,000 Tons Railroad Iron.

THE OHIO AND PENNSYLVANIA RAIL-

ROAD CO. wish to contract for eight thousand

tons of Railroad Iron, for the eastern division of their

road, extending westward from Pittsburgh. Three

thousand tons to be delivered on the Ohio river at

Pittsburgh and Beaver, before the close of canal navigation

in the present year, 1850; and the remainder

in the spring of next year. The rails are to be of the

H pattern, in lengths of 20 feet, and are to weigh 60

lbs. per lineal yard. They are to be subject to the inspection

of Solomon W. Roberts, Chief Engineer.—

For further particulars address the President of the

Company at Pittsburgh.

By order of the Board of Directors.

WM. ROBINSON, Jr., President.

S. S. Keyser & Co., IRON WAREHOUSE,

Corner of South and Pratt Streets,

BALTIMORE, MD.

Selling Agents for the Rough and Ready Bar Iron

and Elk Boiler and Flue Iron Rolling Mills, Sarah

and Taylor Furnaces, and Wrightsville Hollow Ware

Foundry, and Dealers in Bar and Sheet Iron, and

Cast, Sheer, German, Blister, Spring and Electrodes

Steel, etc., etc.

Smith & Tyson,

GENERAL COMMISSION MERCHANTS,

No. 25 South Charles St., Baltimore, Md.

AGENTS for the Celebrated Columbia Pig Iron,

suitable for Car Wheels and Chilled Rolls.

Columbia refined Charcoal Blooms; Refined Char-

coal Juniatta Billet Iron for Wire; Refined Iron for

Bridging, of great strength; Cut Nails, Spikes, and

Brads; Railroad Spikes and Wrought Chairs. 2217

To Railroad Companies and

Contractors.

FOR SALE.—Two Locomotive Engines and Ten-

ders, at present in use on the Beaver Meadow

Railroad, being too light for their coal trains, but well

calculated for either gravel or light passenger trains.

They weigh, in running order, about 8 tons each—

having one pair of driving wheels 4 feet diameter, 4

truck wheels 30 inches diameter, with cylinders 10 in.

diameter, and 18 inches stroke of piston. Tenders on

4 wheels. Address **JAMES ROWLAND,**

Prest. Beaver Meadow Railroad & Coal Co.,

Philadelphia.

or, **L. CHAMBERLAIN, Sec'y,**

at Beaver Meadow, Pa.

May 19, 1849.

2017

Railroad Instruments.

THEODOLITES, TRANSIT COMPASSES,

and Levels, with Fraunhoffer's Munich Glasses,

Surveyor's Compasses, Chains, Drawing Instru-

ments, Barometers, etc., all of the best quality and

workmanship, for sale at unusually low prices, by

E. & G. W. BLUNT,

No. 179 Water St., cor. Burling Slip.

New York, May 19, 1849.

Rosendale Cement.

THE NEWARK AND ROSENDALE LIME

AND CEMENT CO. are now manufacturing at

their works in NEWARK, N. J., and Ulster county,

N. Y., a very superior article of *Hydraulic Cement*—

also Lime Calcine Plaster, etc. Contractors and dealers

will find it to their advantage to call or make application

before purchasing elsewhere. All communications

addressed to the subscriber, at Newark, N. J.,

will be punctually attended to.

ly*15

HENRY WILDE, Secretary.

Patent India Rubber Steam Packing.

THIS article, made by the subscriber, who alone is authorised to make it, is warranted to stand as high a degree of heat as any that has been or can be made by any person—and is the article which has made the reputation of India Rubber Steam Packing and the demand therefor. A large assortment of all thick-nesses requisite for any description of engines, steam pipes, valves, etc., constantly on hand and for sale by the manufacturer and patentee, who will give every information regarding its properties, mode of use, etc. at the warehouse.

JOHN GREACHEN, JR.,
98 Broadway, opposite Trinity Church.
New York, October, 1849.

Passenger Car Linings.

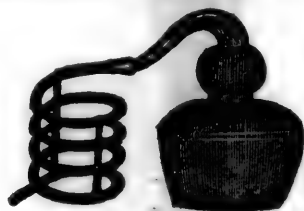
THE Advertiser continues to make to order the Enamelled Car Linings which have been so highly approved the last three years, and are now exclusively used by all the Northern Railroads. No pains are spared to get out new styles, and adapt them to the tastes of every consumer.

Orders addressed to CHARLES STODDER, No. 75 Kilby street, Boston, will have prompt attention.
March 23, 1850. 2m

CAUTION.

RAILROAD COMPANIES and others are here- by cautioned against using or vending our im- provement for easing the lateral motion as applied on Railroad Cars. Letters Patent having been granted to us in 1841, any party or parties so making or using said improvement without license from us will be pro- ceeded against according to law.

DAVENPORT & BRIDGES.



P. H. Griffin,

Corner of Steuben and James Sts. Albany, N.Y.
CONTINUES to manufacture copper flues for lo- comotive boilers, brewers' coppers, stills, tanner heaters, etc. Copper work in general, at the shortest notice. He has constantly on hand brass cocks, brass valves, copper pumps of every variety.
Orders promptly attended to. 1y14

FOWLER M. RAY'S Patent India-rubber Railroad CAR SPRING.

New York and Erie Railroad Shops.
Piermont, March 26, 1850.

This will certify that from practical experience in the use of Fowler M. Ray's India rubber Car Springs, I believe them to be far superior to any others now in use.

I have never known them to be affected by any change of temperature, as other Rubber Springs have been affected on this road.

I am at the present time repairing a Passenger Car that Mr. Ray and myself mounted with his springs about two years and eight months since.

The springs are at the present time as perfect, to all appearances, as when first applied to the car.

Respectfully yours,

HORACE B. GARDNER,
Foreman of the Car Shops.

Supt. Office N.Y. & H. R.R., }
New York, March 8, 1850.

This is to certify that we have used the Rubber Springs manufactured by Mr. F. M. Ray for the past twenty months, "both for Passenger and Freight Car Springs and Bumpers, and of different sizes," and have in every case given entire satisfaction, and I consider them the best spring now in use.

M. SLOAT, Supt.

Harlem R.R. Depot, }
New York, March 7, 1850.

This is to certify that we have used Mr. F. M. Ray's India-rubber Springs for over eighteen months, and find them to be easy and durable, and recommend them to railroad companies as being superior to anything we have tried.

J. M. SMART,
Foreman at 42d St. Depot.

Office New Jersey Railroad Co., }
Jersey City, March 8, 1850. }

FOWLER M. RAY, Esq.,

Dear Sir: In answer to your enquiries respecting the operation of the Vulcanised Rubber Springs, purchased by our company from you some two years since, I reply that they are superior to any spring in use, (that I have either seen or heard of).

The improved form of your spring, consisting of a solid piece of vulcanised rubber with bands on the outside, is far superior to your first form, consisting of disks of rubber with metallic plates interposed.

The last named form was tried, if you recollect, at a much earlier period; and then was replaced by your last form.

I have no hesitation in saying that your springs have given entire satisfaction, and most cheerfully recommend them to railroad companies throughout the country for the following reasons:

1st. The cost is 30 per cent. less.

2d. Saving of weight on each car of 8 wheels from 700 to 800 lbs.

3d. Less care and attention is required, as they are not liable to get out of repair.

4th. A great saving is secured in the wear and tear of the cars and rails from their great elasticity.

5th. The freedom from noise.

6th. There is greater safety in case of accident, as they cannot be broken.

7th. The comfort of passengers is enhanced sufficiently to pay the expense, waiving all the other reasons that I have given.

Should this fail to satisfy any person enquiring, you are at liberty to refer to me, No. 150 Washington St., Jersey City.

Yours respectfully,

T. L. SMITH, Supt.

New York, March 11, 1850.

I have used the Patent India-rubber Spring purchased of Mr. Ray, upon the cars of the New York and New Haven Railroad, and have found them efficient and economical; and when applied to the axles and draw springs, believe them to be quite equal to any in use. I have found a combination of these springs with a steel spring under the transom beam a very satisfactory arrangement, and am now using this plan in all new cars.

Yours respectfully,
ROBERT SCHUYLER.

February 25, 1850.

From practical observation of the use of the India-rubber Car Springs, manufactured and sold by your company, we are entirely satisfied in their application, and do not hesitate to recommend them as elastic, durable, requiring no repairs for years, and retaining their consistency during all extremes of weather. We have applied them for the past two years, and consider them superior for all railroad purposes.

Yours truly,

OSGOOD BRADLEY, Car Builder, Worcester.
T. & C. WASON, do. Springfield.
DEAN, PACKARD & MILLS, do. do.
DAVENPORT & BRIDGES, do. Cambridgeport.

Office of the New Jersey Railroad Co., }
Jersey City, March 7, 1850. }

This is to certify that we have had Mr. F. M. Ray's India-rubber Springs in constant use under our cars, and as Bumper Springs for upwards of two years, and they have in every way given perfect satisfaction.

The present form of spring we deem far superior to the form of Disk, having used both forms, although we have none of those made in Disks at present in use.

We take pleasure in recommending these springs to all railroad companies.

J. P. JACKSON, Vice Prest.
New Jersey Railroad and Trans. Co.

Roxbury, February 23, 1850.

In compliance with your request, I take great pleasure in stating the result of my experience in the use of "Ray's Patented Vulcanised India-rubber Car and Engine Springs." We have used them nearly two years, and never had one fail in any way. The cold weather does not affect them, as it has other rubber springs we have used.

With sixteen years' experience as superintendent of machinery on the Boston and Providence railroad, I take pleasure in saying that your springs are the best we ever used, or I ever saw used elsewhere. We have 20 cars rigged with them, of which I can say that the springs are as good now as when first applied. I put 24 lbs. of the rubber under the forward end of one of our heaviest engines, taking off 250 lbs. of steel springs—it has been in use 18 months, and is in as good condition now as when first put under the engine.

Very respectfully yours,

GEO. S. GRIGGS,
Supt. of Machinery, Boston and Prov. R.R.

Fall River, February 2, 1850.

In answer to yours of the 20th ult. I would say that this company has for some 10 or 12 months past been using "Ray's India-rubber Springs." We have applied them to both passenger and freight cars with uniform success. They have invariably preserved their elasticity and consistency through all the extremes of weather; and we are now applying them whenever the steel spring fails. I am well satisfied that they are particularly adapted for railroad purposes.

Very respectfully yours,

GEO. HAVEN,
Supt. Fall River Railroad.

Jersey City, March 9, 1850.

This is to certify that the present form of Mr. F. M. Ray's India-rubber Car Spring I consider far superior to the form of Disk, having used both forms.

I take pleasure in recommending these springs to all railroad companies.

DAVID H. BAKER,
Foreman of Car Shop of N.J. R.R. & Trans. Co.

Boston, March 5, 1850.

In answer to your enquiry about India-rubber Springs, I have to say that we have used them to a considerable extent on both freight and passenger cars, and also on several of our tenders; and I am very well satisfied that they answer all the purposes for which they are intended. I believe the India-rubber will soon supersede all other springs for cars and tenders.

Yours truly,
S. M. FELTON,

Supt. Fitchburg Railroad.
Old Colony Railroad Office,
Boston, March 6, 1850.

EDWARD CRANE, Esq.,

President New England Car Co.,

Dear Sir: In compliance with your request I would state that the Old Colony Railroad Company have had in use upon their road, India-rubber Springs furnished by your company, for more than eighteen months past, during which time they have been extensively used under Passenger and Freight Cars, Locomotive Tenders, and for Drawer and Buffering Springs, with the most perfect success. The elasticity and consistency of the Rubber has never been unfavorably affected by either extremes of heat or cold—and from the experience which we have had in the use of Rubber Springs, I think them well adapted for railroad purposes—and therefore we have for some months past used Rubber almost exclusively, in all places where springs are required.

Respectfully yours, etc.,

JAS. H. MOORE,
Supt. O. C. Road.

Troy, February 27, 1850.

We have been using your India-rubber Car Springs for nearly two years—and we take pleasure in saying that in our opinion the rubber has to a certain extent already, and may eventually entirely supersede all other Springs for Railroad Car purposes. We now use it entirely for Draw Springs and Bumpers, considering it better and lighter than steel.

During our two years' experience in the use of it, we have not known any to lose their elasticity, or fall in any way; and we cheerfully recommend the rubber for railroad car springs.

Very respectfully,
EATON, GILBERT & CO.

To Practical Machinists.

AN excellent opportunity now occurs to a practical Machinist, of WELL ESTABLISHED REPUTATION, and some capital, to engage extensively in the STEAM ENGINE, BOILER AND FOUNDRY BUSINESS.

An establishment is now ready for business, ample in all its details, including extensive wharf room, for any sized steamboats, and from its position, if properly conducted, will doubtless command a large share of business.

A practical Machinist, as a partner is required, to conduct the whole establishment: and only those FULLY COMPETENT need apply. Address (post paid) "MACHINE CO.," Box No. 741, Philadelphia, Pa. 1m14

Etna Safety Fuse.

THIS superior article for igniting the charge in wet or dry blasting, made with DUPONT'S best powder, is kept for sale at the office and depot of

REYNOLDS & BROTHER,
Sole Manufacturers,

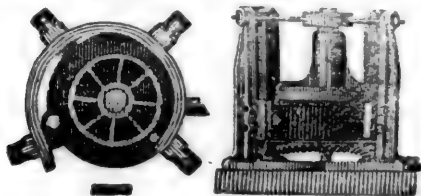
No. 85 Liberty St.
NEW YORK.

And in the principal cities and towns in the U. States. The Premium of the AMERICAN INSTITUTE was awarded to the Etna Safety Fuse at the late Fair held in this city.

November 3, 1849.

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MACHINERY.

Henry Burden's Patent Re-
volving Shingling Machine.

THE Subscriber having recently purchased the right of this machine for the United States, now offers to make transfers of the right to run said machine, or sell to those who may be desirous to purchase the right for one or more of the States.

This machine is now in successful operation in ten or twelve iron works in and about the vicinity of Pittsburgh, also at Phoenixville and Reading, Pa., Covington Iron Works, Md., Troy Rolling Mills, and Troy Iron and Nail Factory, Troy, N. Y., where it has given universal satisfaction.

Its advantages over the ordinary Forge Hammer are numerous: considerable saving in first cost; saving in power; the entire saving of shingler's, or hammerman's wages, as no attendance whatever is necessary, it being entirely self-acting; saving in time from the quantity of work done, as one machine is capable of working the iron from sixty puddling furnaces; saving of waste, as nothing but the scoria is thrown off, and that most effectually; saving of staffs, as none are used or required. The time required to furnish a bloom being only about six seconds, the scoria has no time to set, consequently is got rid of much easier than when allowed to congeal as under the hammer. The iron being discharged from the machine so hot, rolls better and is much easier on the rollers and machinery. The bars roll sounder, and are much better finished. The subscriber feels confident that persons who will examine for themselves the machinery in operation, will find it possesses more advantages than have been enumerated. For further particulars address the subscriber at Troy, N. Y.

P. A. BURDEN.

Railroad Spikes and Wrought
Iron Fastenings.

THE TROY IRON AND NAIL FACTORY, exclusive owner of all Henry Burden's Patented Machinery for making Spikes, have facilities for manufacturing large quantities upon short notice; and of a quality unsurpassed.

Wrought Iron Chairs, Clamps, Keys and Bolts for Railroad fastenings, also made to order. A full assortment of Ship and Boat Spikes always on hand.

All orders addressed to the Agent at the Factory will receive immediate attention.

P. A. BURDEN, Agent,
Troy Iron and Nail Factory, Troy, N. Y.

RAILROAD WHEELS.

CHILLED RAILROAD WHEELS.—THE UNDERSIGNED are now prepared to manufacture their Improved Corrugated Car Wheels, or Wheels with any form of spokes or discs, by a new process which prevents all strain on the metal, such as is produced in all other chilled wheels, by the manner of casting and cooling. By this new method of manufacture, the hubs of all kinds of wheels may be made whole—that is, without dividing them into sections—thus rendering the expense of banding unnecessary; and the wheels subjected to this process will be much stronger than those of the same size and weight, when made in the ordinary way.

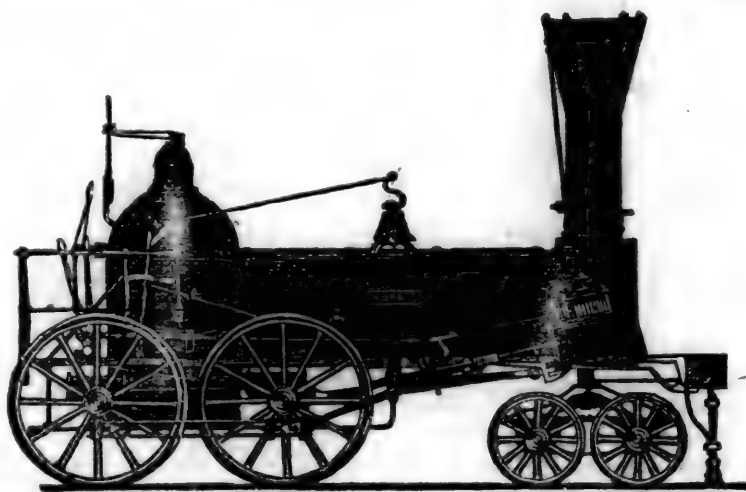
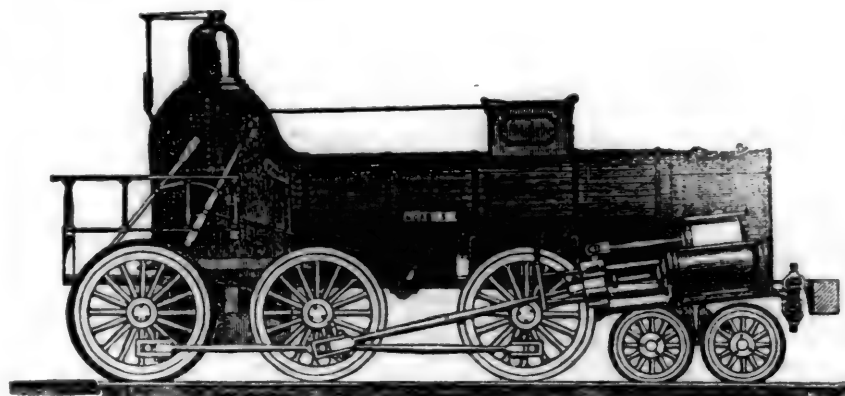
A. WHITNEY & SON,
Willow St., below 13th,
Philadelphia, Pa.

CHILLED RAILROAD WHEELS.—THE UNDERSIGNED, the Original Inventor of the Plate Wheel with solid hub, is prepared to execute all orders for the same, promptly and faithfully, and solicits a share of the patronage for those kind of wheels which are now so much preferred, and which he originally produced after a large expenditure of time and money.

A. TIERS,
Point Pleasant Foundry.

He also offers to furnish Rolling Mill Castings, and other Mill Gearing, with promptness, having, he believes, the largest stock of such patterns to be found in the country.

A. T.
Kensington, Philadelphia Co.,
March 12, 1843.

NORRIS' LOCOMOTIVE WORKS.
BUSHHILL, SCHUYLKILL SIXTH-ST., PHILADELPHIA,

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AMERICAN RAILROAD JOURNAL.

STEAM NAVIGATION, COMMERCE, MINING, MANUFACTURES.

HENRY V. POOR, Editor.

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American Railroad Journal.

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Saturday, July 20, 1850.

Lake Champlain Bloomery Fires.

The accompanying plans of bloomery fires, as used in the Lake Champlain region of New York, are designed to complete the article upon the forges of this district, which was left unfinished on page 290 of the Journal.

The four first figures are sections in different directions through the most simple form of the bloomery. Figures 5, 6 and 7 are sections illustrating a similar fire supplied with the arrangement for reheating the blooms with the gases of the escape heat returned to the oven and mixed with a current of heated atmospheric air.

Fig. 1 is a front elevation of the common bloomery fire: the following letters designate its several parts and the apparatus connected with it.

- a, a, a*—Hot air pipes.
- b*—One of the two bed pipes.
- c*—Main blast pipe from the blowing cylinders.
- d*—Back plate of the fire.
- e*—Fire plate.
- f*—Plate through which the cinder is drained off.



g—Bottom plate of the fire.
 h—Water box placed under the fire.
 i—A small pipe for letting the waste water out of the fire box.
 j—Water twere.
 k—Pipe for supplying cold water to the twere.
 l—Valve for shutting off the hot air from the fire.
 m—Throttle valve for regulating the supply of cold air to the hot blast pipes.

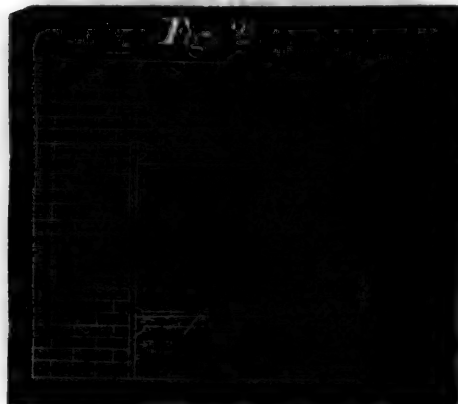


Fig. 2. Horizontal section of the same on the level of the twere.

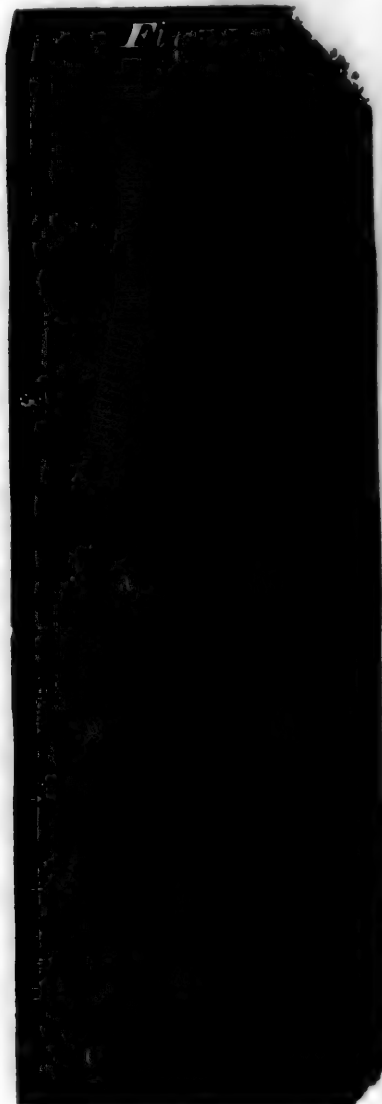


Fig. 3. Side elevation of same. The letters correspond to those in fig. 1.

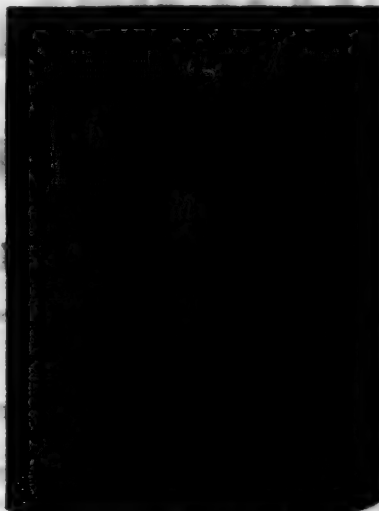


Fig. 4. Horizontal section on level of the bed-plates.



Fig. 5. Side elevation of bloomery fire with oven for re-heating the blooms.

a—Bloomery fire.
 b—Bottom of heating furnace on which the cold iron is charged.
 c—Sand hearth.
 d—Charging door.
 e—Wind box.
 f—Wrought iron blow pipe.
 g—Pipe for conveying hot air to the wind chest.
 h—Opening through which the hot air passes to feed the bloomery fire below, as seen in fig. 7.
 i, i, i—Hot blast pipes lying horizontally in the chimney.
 j—Cast iron door lined with fire brick; lets up and down, and can close the front of the fire, so as to keep out the cold air.

Fig. 6 is a horizontal section of the same on the level of the blow pipes and heating oven.



Fig. 7 is a front elevation of the same. The letters in figs. 6 and 7 correspond to those of fig. 5.



In working these bloomeries it is generally found that from good magnetic ores, well prepared by crushing and washing (unless as in some instances, already cited, the ores are rich enough and coarsely granular at the same time, to render this preparation unnecessary) a hundred pounds of iron are produced every hour, or twenty four hundred pounds every twenty four hours. Two and a quarter tons of prepared ore are used, and about 240 bushels of charcoal to the ton of iron. This shows a considerable loss of ore in the process, much more than in smelting in a well conducted blast furnace; for this prepared ore must average not far from 65 per cent. of iron. It is found most economical to use the air for the blast at a temperature estimated at about 600°; the fire being properly burdened with ore, less charcoal is consumed to the ton of blooms, than when the blast is kept at a lower temperature.

The heating oven connected with some of the bloomery fires requires more than one of these to keep it at a sufficient temperature for re-heating the blooms. The fires are so arranged that two supply the escape gases to each oven. Small blow pipes are more effectual in causing a thorough mixture of the hot air and the gases, and consequently a more complete combustion, than large ones; but

the smaller the blow pipes the greater number must be employed. The pressure of the blast is estimated at from two to three pounds to the inch. H.

Correspondence of the Journal.

DETROIT, MICHIGAN.

Few cities in the United States show probably such marked evidences of prosperity and rapid increase as Detroit. Even after a short absence of six months one is surprised to find large blocks of brick buildings occupying the place of rows of wooden tenements, which have been removed or burnt down. In the main avenue alone, called Jefferson avenue, there are now building brick stores and houses, involving an investment of no less than \$100,000. Such an amount goes a great way, where bricks are furnished, as they are here, for \$2 75 a thousand. The cheapness and great abundance of all building materials, as brick, timber and lime, in connection with the remarkable position of this city on a perfect harbor of great extent immediately in the thoroughfare between the great lakes, insure to it a long continuance of increasing prosperity. On the one side are Lakes Erie and Ontario, on the other is the broad sea, Lake Huron, surrounded with its boundless forests of untouched timber. Beyond this, towards the south, Lake Michigan extends 300 miles, reaching the fertile fields of Illinois and southern Wisconsin; while towards the northwest, Lake Superior, the greatest of all fresh water seas, opens an avenue to perhaps the most extensive region of copper and iron ever yet explored. In the laying out of this great region and in the distribution of its resources, Nature has worked on a gigantic scale, and the design evidently contemplates gigantic results in the development by man of these resources. Much has already been done within a few years, even before the existence of the wealth stored beneath the surface was suspected. The discovery of this is hastening with accelerated speed the already rapid progress of improvement.

No place will be benefitted by this like Detroit. Its situation, which we have before alluded to, is along the northern bank of the Detroit river, which connects Lake St. Clair with Lake Erie, and which is here nearly a mile wide. The depth of water in the river is from 12 to 60 feet; the largest steamboats lie along side the piers, which extend up and down the river, and on which within a few feet of the water stand the warehouses. The freight depot of the Michigan Central railroad has a water front along its whole length of 800 feet, and discharges flour by sliding the barrels by their own gravity from the building directly down into the vessels lying opposite to it. Similar accommodations may be had at very little expense of preparation for six miles up and down the river. No harbor can be more secure against all winds; and at the same time less liable to sudden squalls, such as are frequent under high hills like those bordering the Hudson river. These picturesque objects are wanting to the scenery of this region, whose monotonous character of flatness is wearisome to eyes accustomed to bolder and more varied outlines.

In front of this long line of shore, so suitable for the construction of piers, hardly a third of which is yet occupied, and opposite as fine a natural site as can be found for a city of vast extent, pass all the vessels and steamboats engaged in the commerce through the green lakes. Here must pass all the products of the Lake Superior mines on their way to the eastern markets, and here will soon spring up extensive works, fed by the cheap min-

eral fuel of the neighboring coal fields of Ohio and Michigan, or the equally cheap charcoal from the forests of hard wood now standing in full sight around Lake St. Clair—for the conversion of the crude metals into the various refined articles such as are now furnished from the remote establishments of Old or New England. Steam engine factories, machine shops, foundries and steam saw mills are already in active operation, and the first step is already taken for the establishment of works for the refining and working up of the copper of the upper country. This must be followed, so soon as the forges now constructing in the iron region will insure a large supply of blooms, by rolling mills for the manufacture of bar and boiler plate iron of qualities far superior to those furnished by the argillaceous ores of Pennsylvania and Ohio.

Other works are also urgently required at this place, for which its own capital, invested to a great extent in real estate and in commerce, cannot well be employed. They are objects also not coming within the experience of those who feel the want of them; and which, therefore, they look to be supplied with from abroad. The most prominent perhaps among these is a *Dry-dock*; and the attention of those familiar with the construction of one and able to undertake it, may well be directed to the inducements offered by this locality. The first consideration is the number of vessels owned in and passing the place; and the second, the facilities already secured for taking these out of the water for repairs.

The following table, prepared from the custom house returns, as far as these furnished data, gives the number of steam and sail vessels that arrived at and departed from the port in 1849, also the number of steam and sail vessels that passed Detroit, ascending and descending, during the season of navigation (say seven months) in the same year.

Total Number of Vessels Arrived at Detroit in 1849.		No. Tonnage.
American vessels entered from Canada		
American vessels cleared to Canada	147	10,906
British vessels cleared to Canada	155	11,470
British vessels entered from Canada	373	57,859
American vessels entered from other American ports	378	63,006
American vessels cleared to other American ports	1687	531,907
American steamers passing up	220	165,000
“ “ “ down	220	165,000
“ propellers “ up	220	83,000
“ “ “ down	220	83,000
“ sail vessels “ up	1200	283,000
“ “ “ down	1200	283,000
Total	7755	2,267,505

The steam and sail vessels passing up and down are estimated from the returns of the collector, the numbers given being approximate only, but probably as nearly correct as they can be obtained. Besides those included in the above table are the arrivals and departures of vessels within the district, which are not reported at the custom house. These are not far from ten each day, at an average tonnage of 30 tons each. This would add about 2000 vessels and 60,000 tons.

Steamers owned in Detroit	53 of 18,034-25 tons.
Propellers	5 of 1,180-46 “
Total	30 19,214-71 “
Tonnage of sail vessels owned at Detroit	17,773-23 “

The only point on the entire chain of lakes where vessels of any size can be hauled out, [excepting Oswego on Lake Ontario, which is separated from the range of these vessels by Niagara Falls] is in

the crooked, narrow, and closely packed harbor of Buffalo creek; and the only accommodation here is a rudely constructed railway, the best of which are not always safe for taking out large vessels.—Detroit, midway in the great route of the lakes, and largely engaged as it is in navigation, has not even this provision for the repairs of the shipping that frequents its harbor.

Some idea of the importance and probable profit of a dry dock may be obtained by reference to a single instance, showing the present cost of getting an examination even of the hull of a steamer.—The London, a boat of 375 tons burden, owned at this place, required a short time since such an examination and some slight repairs. She was taken to the railway at Buffalo, and hauled out; the necessary work was done, which did not require thirty hours' time, and the expense was \$825.—Such instances are of almost daily occurrence: so that it would seem if a dry dock were built at this convenient and commodious harbor, it must secure constant and very profitable employment. Vessels wanting repairs would make it a point to have them done here; where all other facilities of repair and outfit are already provided.

An effort is likely soon to be made to accomplish this object; but capital for such undertakings, when their merits are fully appreciated is more likely to come from the eastern cities, than to be furnished here. The knowledge and the skill for constructing a work of this kind can only be had there. Information is now desired by parties at Detroit as to the mode and cost of construction, where timber of any dimensions can be afforded at the lowest rates, of a dock capable of taking a steamer of, say, 300 feet in length and measuring 1400 tons.

The population of Detroit is now calculated to be over 24,000. In 1843 it was 9,300—probable increase in seven years, 14,700. The present rate of increase is considerably greater than the average during the last seven years. The country around is a fertile agricultural district, connected with the city by the Michigan Central railroad, which traverses the entire State, through the “centre tier of counties,” and the Pontiac railroad, completed and in operation 24 miles. There are also four plank roads building, one of which will be completed 30 miles, and the remaining three from 10 to 14 miles by the 1st of September next. It is contemplated to extend these roads from 40 to 60 miles into the interior. They lead directly into the richest and most populous counties of the State. By them every product of the farmer, as well as all kinds of timber and lumber, will be easily transported to the city at a trifling expense. Beside these means of communication with the interior, are bays, inlets and navigable streams leading from 40 to 50 and in some instances 100 miles into the country.—During the winter season, communication with the eastern States is greatly interrupted by the closing of the lakes. The nearest route to Buffalo is then through Lower Canada, the journey, which is now accomplished by the fine boats of the Michigan Central railroad company in 17 or 18 hours, then requiring about three days. Along the southern shore of Lake Erie it often takes six days. At the present rapid increase of population and internal improvements, it may reasonably be expected that the long desired railroad connection with Buffalo will be completed within a few years.

With such advantages of position and natural resources, the State of Michigan is certainly destined to take a high stand among the enterprising

and productive States of the Union. Its mineral resources, first brought to public attention by the lamented Dr. Houghton, have since been actively investigated under the patronage of the general government, and will no doubt be found abundantly treated of in the forthcoming report of Messrs. Whitney and Foster, for which we are looking with much interest. The results of our own investigations in the mining region of Lake Superior will continue to be reported in this Journal. H.

An Essay on Pen and Pocket Cutlery,

Embracing a Detailed Description of the Mechanical, Chemical, and Manual Operations Performed on Certain Raw Materials, to Convert them into the Means, Implements, and Materials, for Manufacturing Pen and Pocket Knives.

BY A. L. HOLLE.

(Continued from page 403.)

CHAPTER VII.—DESCRIPTION OF THE OPERATIONS PERFORMED BY THE ENGLISH CUTLER ON A FOUR BLADE, SHELL HANDLED, CONGRESS KNIFE.

Having spoken of the tools and materials, we will now describe the operations performed on the latter, to convert them into a four blade, shell handled, Congress knife. The scales are simply pairs of irregular strips of brass, with bolsters riveted to the ends, around which there is a thin "fash"—as it is termed by Sheffielders, or "burr," as it is called in this country—or rough edge. The cutler sitting on a stool at his bench, with a short pair of shears first trims off this edge from all his scales, then holding them on the right edge of his steady, or anvil, which is convex, draws and bends them to fit the plate, with a hammer. This process is called "ratching." The scales are next placed one by one with the plate, in the vice, and in a proper position, and the spring or middle hole made, and the inside of each bolster is marked for drilling through the holes in the plate, by a hand "parcer." This is sometimes called a fiddle bow drill, and consists of a rod of steel with a round point at one extremity, which rolls in the boss of a breast plate strapped round the cutler, and a hardened and tempered cutting part at the other end with flattened sides, commencing at a shoulder, from one-eighth to one-half an inch from its sharp, wedge-shaped point. A stick, as it is called, resembling a fiddle bow, having both ends of a small strap fastened to its either extremity, is moved backward and forward by the cutler's right hand. This strap passes round a roller fixed to the centre of said rod, and imparts a rotary motion to the drill, which cuts as it turns, both ways. The bolsters are then drilled in like manner, when a pair of scales are put, insides together, on either side of the plate, and a point, [or hardened and tempered steel wire from one to two inches long, snugly fitting the plate holes, and pointed at one extremity] is driven thro' both mark side bolsters, both ends of the plate, and the corresponding orifices in the opposite bolster, thus making the whole as a solid piece, when they are fastened in a vice, and the scale and bolster edges filed down to the plate by a coarse, then a fine file. Files are cut when soft by a hand chisel, and often by a machine, then hardened and tempered. The sides of the scales are next filed to remove the fash, the ends of the bolsters which the covering is to fit are filed till regular, then the points are driven out, the scales removed, and another pair passed through the same operation, till

* This work is perhaps a corruption of ratching, or wrenching, and like many other Sheffield words, is found in no dictionary of any language.

all fit the same plate and each other. With a drill of very small diameter, the cutler then makes an orifice in each scale end, equally distant from the edges and bolster, through which a rivet is to pass, and fasten down the covering. The scales are then "dished," which consists of striking them with the riveting end of the hammer on the outside, which renders that side slightly concave, and better prepared to fit the covering. The covering is now rough and crooked strips of tortoise shell, which the cutler holds singly over the blaze of a lamp, and as they are softened by the heat, he bends them till straight, which form they retain when cold again. The strips are now levelled by filing with a fine rasp, then matched, which consists of filing the end sufficiently, and to such a shape, that both will fit the bolsters, and set evenly to the scale, then drilled by passing the "parcer" through the small orifice in the scale end, and perforating the shell. To match the covering so closely to the scales and bolsters in every place that the point of the thinnest blade may not be placed between them, is a difficult and a very nice operation, and is generally performed on none but fine knives. The shell is scraped till smooth with a shaving knife on the inside, so that if the scale is transparent in any part, the substance under it may appear. A shaving knife is a blade, shaped like a razor, with the edge ground square, that each corner may describe a right angle. The handsomest shells are always placed on the mark side of the knife, and after all are matched with their respective scales they are rivetted to them. On each brass scale is laid a strip of either gold leaf, or Dutch metal, usually the latter, which is copper, brass and bronze leaf, or is sometimes composed of 25 parts gold, 4 silver and 7 copper. On this leaf is laid the shell, when the wire is passed through from the inside of the scale, and cut off with nippers or pliers. All are thus served, then riveted by filing the wire end smooth, and beating on a head with a light hammer. This is also a nice operation, as the scales and shell are to be drawn together by the rivet, and the covering must not be cracked, or checked, as is often the case, particularly with pearl, ivory and cocoa.

The metal scales and covering now together called scales, are put up in pairs with points, placed in a vice, the shell is filed down on the edges to the brass, and the middle or spring holes in the shell are drilled. The springs are then straightened and fitted to the plate with a hammer, placed with the plate in a proper position in the vice, marked for drilling by a short hand parcer, and then bored like the bolsters. The cutler next places them inside up in the vice, files the inside with both a coarse and fine half round file, fits the ends to a hardened spring of proper length; and then places them one by one between two plates in a vice, to which he files the backs. They are now leveled on the sides snugly with the aforesaid instrument on a block of wood in which is an upright metal point, fitting the spring hole, and keeping them stationary. The springs must be bent before tempering, else they might not have sufficient power to keep the blades open or shut. This is done either by striking their insides as their ends are elevated, or by fastening them between two plates, placing a point through the end plate holes over one end of the spring, and striking the other till bent sufficiently. A dozen or two of the backs are now fastened together by a wire passing round one end and thro' the middle holes, heated to a cherry red, or a little

above, then immersed in cold water, when they are hard and brittle. They are tempered with oil, or better, with tallow, not by plunging them therein, but by covering them with a thin coat of it, and heating them over a slow fire till it is burned off. The cutler can usually ascertain by their appearance, and always by passing a file over them, the degree of hardness, and this is very necessary, for if too soft, they will not be sufficiently elastic to overcome the resistance of the blades, and will permit the latter to rattle and remain in any position in the handle. If the springs are too hard, they will either break on opening the blade (and nothing vexes a cutler more than to delay his work to fit new springs in place of broken ones), or shut the blades with such force as to break them, or if the blades are heavy, to strike their edges on the inside of the back, or to greatly endanger the nails of the person who opens the knife. Hence it is important that the springs should be well tempered, and if they are of the proper hardness, they are taken apart and straightened, as they are usually much bent by the heat. The insides, sides and ends are next glazed by holding them on wheels from 9 to 15 inches in diameter, and from 2 to 3 inches in width, which revolve from 600 to 800 times per minute, and are covered with leather, on the circumference of which is glued a coat of emery.—These glazers, with other wheels, are fastened by screws, so as to be easily removed, run on points, and are impelled by a strap which passes round a long drum in a cutler's frame.

This frame can be of any length, and is if single, from 2½ to 3 feet high and wide, and supports boxes for the points of the glazer shafts, and a shelf for the knife boards. Each cutler has a coarse glazer, as above described, and one or two fine glazers, which are made from the former, after its first coat has been partially worn off, by covering it with cake emery, a compound of the finest flour emery, tallow and beeswax, and which renders the steel very smooth, though not bright. Emery, from Emery, in the island of Naxos, is a variety of corundum, very compact, generally opaque, and excessively hard, and capable of scratching, and wearing gradually away, anything except diamonds. It has no determinate form, but is amorphous, and used when pulverized. Corundum is composed of nearly pure alumina, and is of a red-color, and is allied to sapphire. Glazers, when worn out, are dressed, by soaking and scraping off the old glue, and putting on a new coat of emery. The blades, as left by the gripper, are now taken, marked by a hardened fitting tang, and drilled like the springs. An upright metal point, protruding from the mark side of another, or the same fitting tang, is placed in the orifice in the blade tang, both together are screwed into the vice, and with files the blade is reduced to the pattern. The blades are squared, or in the language of a Sheffield cutler; "squared" by this operation. Strips of sheet brass, the shape of the knife, are now cut out, drilled and filed down between two plates for middle scales, which with the blades, springs and scales, are put up in hafts, in the following order:

To be continued.

On the Utility of a Knowledge of Assaying and Analysis in the Treatment of Metallic Ores in the Smelting Process.

Nothing more clearly proves the want of knowledge of our forefathers in metallurgical and chemical operations, and their ignorance of the constituents of the minerals from which they produced

their metallic results, than the refuse of their operations in the form of slags or scoria, and the remains of the rudely constructed furnaces they used, and it is only within the present century that works of this nature seem to have been conducted on any thing like scientific principles. It is true that where there is abundance of material there is too often waste, and this may in some measure account for the richness in metal of some of the slags; but it is evident that had the former operators been properly informed in their business, they would have extracted the full produce of their minerals. From the enormous quantity of slags in various parts of the kingdom in the lead districts, it is evident that they could not have properly prepared the ore for smelting, as if the ore was dressed to a high produce, there could have been but little scoria formed, while on the Mendip hills we find these slags existing in some places to a depth of thirty feet, and covering an area of ground reaching more than a mile in length, and nearly the whole breadth of the valley, and by assay containing from 15 to 45 per cent of metallic lead. Had assaying been understood at the time these ores were worked, it is evident that the ancients would have found some of their refuse to contain more lead than some parcels of ores which they subjected to their rough smelting process. The same observations might also be made respecting the sharp slags of the iron-works, and even of late date the metallic contents of the copper slags. But let us see under the different heads how far the knowledge of assaying and analysis is useful. I would say in regard to the former, that the books of every well regulated smelting establishment should prove its utility by showing that the produce, within certain limits, should correspond to the amount calculated by assay from the bulk of mineral operated upon. This is considering assaying as only giving the quantity of one or two metals, as lead and silver in a given weight; but should it be proved that such gross produce is not (as before said, within certain limits) equal to the assay in working on a large scale, it is evident there is some cause for it, and the only remedy to improve the process, is a knowledge of the constituent parts of the mineral or scoria, formed by analysis, as the manner of treating metallic ores depends upon the state of mineralization of the metallic contents, and the description of its earthy matter.

Metals in a state of oxide are very liable to combine with the earthy gangue in a state of fusion, as is shown in the article of glass, one sort of which may contain from 15 to 20 per cent. of lead, and yet remain clear, in fact its transparency improved, and therefore not detectable except by analysis; and the various colors given to glasses are from proportions of metallic oxides in a state of vitrification, with the silica and other compounds. Thus, then, by the knowledge of metal existing in a state of oxide we know that a proportion of carbon is requisite to produce it in a metallic state. Where sulphur is by analysis proved to exist, it shows the necessity of adding some substance in the reduction (as lime or iron,) which has a nearer affinity for the sulphur than the metal to be reduced; when arsenic is present, the necessity of calcination previous to reduction of the other metal (as tin, &c.,) in order to prevent injuring its quality; and in fact the whole list of metals might be gone through to show what effect would be produced in the smelting process by a want of knowledge of the other metallic constituents, and the state of mineralization in which they exist, and this only can be ascertained by analysis; but, above all, in order to produce the largest proportion of metal in the smelting process, it is requisite to know the proportion of the different earthy constituents of the ores, as on this depends the admixture of other earths, so as to produce a slag at once readily fusible, and in such proportions as to form a perfect vitrifiable scoria, without the combination of any metallic oxide; or if they do contain any, only such as are not required to be reduced to a metallic state. Thus it will be seen that a knowledge of analysing these scorias will be of two-fold advantage:—First, to see what metallic oxides they may contain, and the proportions; and secondly, whether the proportion of earthy matter is in such quantity as to form the silicates, with other compounds without the metal required to be reduced.

From the London Artizan.

Improvements in Iron Manufacture.

Sir F. C. Knowles has recently patented an improved method of making iron direct from the ore, which appears to be based on sound chemical principles. The patentee states that the method was suggested to him by a consideration of the fact that coal, in the process of coking, whether in coke ovens, or in the blast furnace, as raw coals, loses a large portion of its weight in the form of gaseous matter, composed chiefly of carbon and hydrogen, and by considering the well known superior deoxidizing and cementing power of these elements in the aeriform state, as compared with their solid and crude condition in coke or bituminous coal. This loss is increased by the action of the blast on the materials in the lower parts of the blast furnace, which has been computed at upwards of eighty per cent. of the entire weight where raw coal is used. In addition to this, only the poor earthy ores have been used, while the nearly pure ores have been neglected; and we import foreign iron for the purpose of conversion into steel.

For the first process—that of making the iron direct from the ore, without any previous smelting—the patentee selects those ores most free from earthy matter, and the nearer they approach to pure oxides the better. For another process—the preparing ores by cementation in retorts, to make cast iron, by smelting afterwards—the ores are taken indifferently, excepting such as contain much sulphur and arsenic. They are first broken into pieces of moderate size, so as, when placed together in a heap, there may be interstices between them capable of admitting gas or vapor through them without obstruction. They are then placed in retorts, rendered gas-tight, and brought up to a red heat, each of which is connected with gas tubes, having stop cocks for the purpose of injecting and regulating a current of gas among the ore. For this purpose two sorts of gases are used by the patentee—common carburized hydrogen, or coal gas, and carbonic oxide, prepared by slow combustion of charcoal or coke. The patentee does not confine himself to coal gas, but employs any hydrocarbon which can be produced economically.—When the retorts are charged, the gas generated, the rationale of the process will be as follows:—The ore being mainly an oxide, the hydrogen of the hydrocarbon unites with the oxygen of the ore to form water, while the carbon unites with another portion of oxygen, forming carbonic oxide or carbonic acid, as the case may be, leaving metallic iron as the result. The ore being so far reduced, the next stage of the process, when malleable iron is the proposed product, is to shut off the gas on both sides of the retorts, and transfer the contents of the retorts to the puddling furnace, where the iron is treated in the common way. It may be cut, piled, re-heated, and rolled as usual, according to the nature of its distinction or quality required. If steel be required, the cementation must be carried further, until the reduced metal has absorbed about 1 per cent. of carbon. The reduced and cemented ore is then put into crucibles, or melting pots, to be run down into ingots in wind furnaces, as is now done in the making of cast steel. If the earthy matter in the ore require it, some proper flux is to be added; according to the usual method of fluxing iron ores. If cast iron be required, the cementation must be carried on until about 3 or 4 per cent. of carbon is absorbed, after which it is transferred to the blast furnace, with a proper flux. The patentee further claims, where cast iron or steel is the product required, the separate cementation of iron ores with charcoal, coke dust, anthracite coal, coke, &c., on the following iron ores:—Pure specular ore, red and brown hematite, black oxide, red and brown ochreous ores, magnetic iron ores, spathose ores, being carbonates of protoxide of iron, and different from the argillaceous iron ores of the carboniferous series of rocks above the mountain limestone. Lastly, the patentee claims the use of spathose iron ores and "soft mine" as a flux, to supersede the use of limestone; the ore is first roasted, to drive out the carbonic acid, and then mixed with other ores in such proportion that the lime contained in the aggregate may bear a due proportion to the silica and alumina in the other iron ores to be smelted.

Crystallized Gold from California.

BY FRANCIS ALGER, BOSTON.

[Read in part, before the Boston Society of Natural History, April, 1850.]

I have lately had an opportunity of examining some parcels of California gold, which have afforded specimens worthy of especial notice. Those which I purpose to describe in this paper, I obtained from the collections brought home by Mr. Geo. E. Tyler, of this city, and Mr. H. B. Platt, of New York. They consist of well characterised octahedral crystals, simple and modified, the surfaces of which have been but slightly disfigured by attrition, or the effects of transported action usually observed in other specimens. I cannot say that I have ever before seen what was unquestionably a genuine crystal from this new land of gold; an irregular crystalline plane could only occasionally be traced out in former specimens; but here we have examples of crystallization, as perfect among the small ones especially, as are to be seen in magnetic iron ore or in spinelle. The most striking examples on a large scale, are octahedrons of the dimensions of the accompanying figures. They are isolated crystals, and the smallest one, which



is the most perfect, is so entirely free from any adhering portion of the matrix to which it must have been attached, as to lead me to believe that this matrix was a much softer material than the quartz in connection with which the gold is usually found. Although its exact locality is not known, it is probable, as indicated by its slightly worn appearance, that it has been but recently dislodged from its original resting place. This crystal presents four pretty regular faces, and has three of its solid angles perfectly formed to a point. It exhibits no modifications; but two of its faces are depressed—one of them by a very deep cavity which extends not quite to the edges of the plane, but so near to them as to leave a narrow ridge or border, all around the cavity and parallel with the edges, thus giving the same triangular outline to each. It appears as if the crystal had been in a liquid state, and that soon after the outside had congealed, the inner portion, or a part of it, had run out, leaving the surrounding consolidated edge just referred to. I have seen something similar to this formed among artificial crystals, as for instance, metallic lead (which takes the form of an octahedron) and lead ore partially desulphurized, when the metal was allowed to flow off slowly, just as the outer crust had formed over the surface of the crystals.

The large crystal presents only one half of the octahedron, its base blending with the massive gold, or only indicating the incipient planes of the lower pyramid. Three of its planes are perfectly smooth surfaces, excepting along their edges, which are prominently marked by the same projecting border or ridge already described on the smaller crystal. This border may have been produced in the same manner by the shrinking away of the metal, or it may be the result of that kind of crystallization which is dependant on a greater intensity of molecular attraction in one direction, or axis, than another. It would seem in this case, as if the molecules arrived at the points of contact along the edges of the crystal, faster than they could be appropriated, and thus they have accumulated in these little ridges. This peculiarity is not confined to the large crystals, for it is observed even among the smallest; but it is confined to the unmodified octahedrons. In a few crystals, there is a double series of these ridges, the inner one representing, apparently, the commencement of another crystalline face within the cavity of the larger one. This is beautifully shown in the third figure on the

last page, also answering to the natural size of the crystal.*

The great size of these crystals, and the fact that some of the cavities contained portions of oxide of iron probably produced by the decomposition of pyrites, have led some to regard them as pseudomorphs of sulphuret of iron. I am not disposed to ascribe any such forced and unnatural origin to these beautiful productions. I believe them to have been formed under the ordinary circumstances of crystallization, either in an open space, or while surrounded by a matrix so soft and accommodating, as to allow them full freedom to take the form it was intended they should take. Were the crystals cubes, there might be some reason for regarding them in the light of pseudomorphs of iron pyrites, because this is the most common form of pyrites, and, moreover, all the pyrites that I have seen from California, has been in that form. But, we may ask, who has ever seen even a cubic pseudomorph of gold? Crystals of gold are rare, cubes particularly so, and yet this form, on account of its simplicity, is made the primary form; whereas it would seem as reasonable in cases of the regular system, to select that form as the primary which is most commonly and perfectly presented by the mineral, provided there is no cleavage to guide us in the determination; and there does not appear to be any, well made out, among most of the native metals. By assuming those which most commonly occur in nature, we seem to recognise a sort of inherent disposition, a preference, as it were, which is shown by the mineral itself; and we avoid what seems to be a palpable inconsistency, viz: the establishing of a cube as the primary form of minerals which have never been known to occur under such form, and which even present a distinct octahedral cleavage. This is the case with two at least. If we take the simplest form, the cube should be made the primary of native iron, copper, lead, silver, and mercury; and so of some others, which occur in octahedrons and are not determined by any certain cleavage. In the case of copper, some authors have made the cube its primary.† Haüy (Traité, 1806) even expressed his doubts as to the existence of cube gold, while he cites examples of the octahedron; and Beudant, (Min., 1832) says they are very rare.‡ Mohs implies the contrary, for he says (Mia. Ed. by Haidinger) they are often hollow, while the octahedrons are smooth. Cleaveland describes the crystals in general as small and imperfect, and Nicol, in his late work, in the like manner, observes, "they are small and very small." I hope we may yet say of our California gold crystals, they are large and very large, as much for the benefit of mineralogists, as a reward to the industry and hard toil of the diggers.

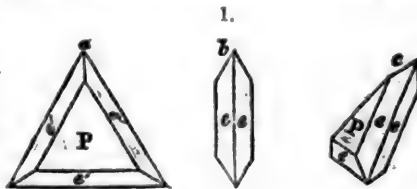
Crystals of Rare Modifications.—Among the

* The two large crystals above described were obtained from the very choice and beautiful collection of specimens, made with great care, and at no small expense, by Mr. Platt. This gentleman, during a most prosperous residence of two years in San Francisco, and while occupying a situation which brought him into daily and almost hourly contact with persons returning from the mines, has evinced his good taste by purchasing the most interesting specimens obtained by them. He has consequently been rewarded by the finest amateur collection hitherto brought from California. It comprises a great variety of ramified, arborescent, dendritic and other imitative forms, here and there showing crystalline faces, all of them being sometimes most fantastically joined together in the same specimen. He informs me that in obtaining this collection, he had examined gold to the amount of more than four millions of dollars.

They differ in regard to silver and iron, some adopting the cube, and others the octahedron, as the primary.

† Cronstedt, in his Mineralogy, says, "I have procured in Transylvania a specimen of cube native gold, but I have never seen it any where else." In Levy's enumeration of the splendid Turner collection formed by Henry Heuland, eight examples are given of the regular octahedron, and only two of the cube, one of these being from the very locality Cronstedt speaks of.

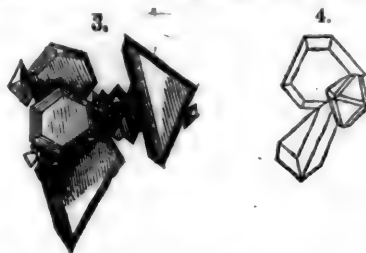
specimens collected by Mr. Tyler, I have found several rare modifications of this metal, such as come to us in their most perfect form from Brazil. I here give figures of two of them. One, fig. 1, (a b c)



represents a compound form produced by the union of two opposite sections, or segments, of an emarginated octahedron; a form not unfrequently presented by octahedral spinelle.

The other, fig. 2, has the apparent form of irregular six sided tables, with truncated edges; and is a modification of the same form. They are tolerably well represented by the figures referred to, but the planes of the dodecahedron (c) are less conspicuously defined on the real crystals, owing to their extreme thinness, and their edges being rounded off, or otherwise disfigured. For this reason, we can distinguish but two of the primary octahedral planes on any of these crystals. Crystals somewhat resembling fig. 3, have been brought from Brazil and Siberia; they had the same flattened form of six-sided tables, but they are the result of a different kind of modification, and are not macles. Dufrenoy and Levy* have each given a figure of a very perfect example of the modification here referred to (triforme of Haüy) derived from the cube, octahedron and dodecahedron; and I was at first, inclined to regard my crystals as the same, only more deeply truncated on the solid angles a, as lettered by Dufrenoy. Further examination however, proved them to be the same mackled combination as fig. 1, with the additional replacements indicated by the letters b, which have changed the triangular face P, and the whole crystal, into a hexagonal figure as above represented. These new planes are sometimes unequally extended, and roughened by inequalities, while the primary faces P, are perfectly smooth and brilliant.†

Some of the unmodified macles, as shown in different positions by fig. 1, a, b, c, are very distinctly formed, the edges between c c, uniting the two segments of the octahedron, being well defined. This



is the most strikingly shown on the largest of these crystal, the lowest one of the group represented by fig. 3.‡ Owing to its position, it is only partially visible in the group as here drawn, and fig. 4 is intended to show it as it appears on the opposite side of the specimen in juxtaposition with two other crystals, one a very beautiful and smooth planed octahedron with emarginated edges. Dufrenoy has described a macle of gold quite similar to fig. 1, and it may be seen figured in the volume of elegant and copious crystallographic illustrations which accompany his treatise.§ It came from the Matto-

* Fig. 576, plate 144, of Dufrenoy's, and fig. 3, plate 47, of Levy's Atlas of Plates.

† In the Turner collection there is a single macle crystal answering almost exactly to fig. 2, and Levy has figured it in his Atlas, plate 47, fig. 4.

‡ This groupe represents the figures as magnified to about twice their natural size.

§ Atlas, plate 145, fig. 581.

Grosso, in Brazil, and is in the collection of the School of Mines, Paris. It differs from the example here described,

in exhibiting more of the planes of the octahedron and dodecahedron. Fig. 5 is a copy of his figure, but regarding the octahedron as the primary form of gold, I have, besides conforming his lettering to the notation of Phillips, made primary planes of those which he gives only as secondaries of the cube.

It should be observed that as nearly all these crystals show the effects of more or less abraded action, it is often difficult to distinguish planes confined within such narrow limits, and which are too small or too rough to admit of accurate measurement. We can hardly expect to see many perfect crystals from California, until the rocks themselves are systematically explored, from whence have proceeded the millions of fragments that are now scattered over the plains and valleys. We may, from the indications already afforded, look for crystals of gigantic dimensions, and possessing all their native unaltered beauty.

Boston, May 17, 1850.

TABLE OF SPECIFIC GRAVITY.

Metals.			
	Weight, water being 1000.	Number of cubic in. in a lb.	Weight of cubic in. in lbs.
Platina.....	19500	1.417	.7053
Pure gold.....	19258	1.435	.6965
Mercury.....	13560	2.038	.4904
Lead.....	11352	2.435	.4105
Pure silver.....	10474	2.638	.3788
Bismuth.....	9823	2.814	.3552
Copper, cast....	8788	3.146	.3178
sheet.....	8910	3.103	.3225
Brass, cast.....	7824	3.533	.3036
sheet.....	8396	3.293	.3037
Iron, cast.....	7264	3.806	.263
bar.....	7700	3.592	.279
Steel, soft.....	7833	3.530	.2833
hard.....	7816	3.537	.2827
Tin, cast.....	7291	3.790	.2636
Zinc, cast.....	7190	3.845	.26

Stones, Earth, &c.

	Weight, water being 1000	Weight of a cubic foot in lbs.	Number of cubic feet in a ton.
Marble, average.....	2730	170.00	13
Granite, ditto.....	2651	165.68	134
Purbeck stone.....	2601	162.56	134
Portland ditto.....	2570	160.62	14
Bristol ditto.....	2554	159.62	14
Mill stone.....	2484	155.25	144
Paving stone.....	2415	150.93	144
Craighleith ditto.....	2362	147.62	15
Grindstone.....	2143	133.93	164
Chalk, British.....	2781	173.81	124
Brick.....	2000	125.00	17
Coal, Scotch.....	1300	81.15	274
Newcastle.....	1270	79.37	284
Staffordsh'g.....	1240	77.50	29
Cannel.....	1238	77.37	29

EXPANSION OF SOLIDS by increasing the Temperature from 32° to 212°, the Length of the Bar at 32° being 1.0000000.

Glass tube.....	1.00062800
Platinum.....	1.00088420
Antimony.....	1.00108300
Cast iron.....	1.00111111
Steel.....	1.00118999
Blistered steel.....	1.00112500
Steel hardened.....	1.00122500
Bismuth.....	1.00139200
Silver.....	1.00189000
Tin.....	1.00217298
Gold.....	1.00150000
Lead.....	1.00286700
Brass.....	1.00186671
Wrought iron.....	1.00125800
Zinc.....	1.00294200
Spelter solder, brass 3, zinc 1.....	1.00905800
Soft solder, lead 2, tin 1.....	1.00250800
Copper 8, tin 1.....	1.00181700
Palladium.....	1.00100000

By this table it appears, that in the Cornish boiler 1st. The ratio of the area of the heating surface to that of the fire grate is more than twice as great as in the common boiler.

2d. The proportion of heating surface to the quantity of water evaporated, or of fuel consumed, in a given time, is about ten times as great.

3d. The rate of combustion is slower with the Cornish boiler than with the common one, in the proportion of about 1 to 4.

One pound of steam will raise 3,657 cubic feet of air 10° , and cause it to expand from 353 to 42° , about 3,733 cubic feet.

The heat that would raise 1 pound of water 1° would raise a pound of air 30.7° : one pound of air \approx about 11 cubic feet.—*Weale's Engineer's Pocket-book.*

AMERICAN RAILROAD JOURNAL.

Saturday, July 20, 1850.

Steam Communication with Europe.

The project of opening a new route for travel between the United States and Europe, by extending a railway from Maine to the eastern part of Nova Scotia, and by establishing a line of steamers from that point to Galway Bay, in Ireland, to connect with a line of railroad from thence to London, is attracting much attention in the Eastern States and in the British Provinces, and bids fair to assume an importance corresponding to the magnitude of the object to be accomplished.

The scheme, as developed, is comparatively new. People, therefore, are startled at its magnitude and incredulous as to its success. To the great mass the *unknown* is always impossible. What distinguishes superior minds is anticipating the future, and in bringing out into the actual, the concrete, what existed only in the abstract. But the proofs of the success or practicability of this scheme do not rest on opinion, nor in the superior sagacity of individuals. Its feasibility we think can be demonstrated by arguments apparent and conclusive to all.

In the first place, the route proposed is much more direct than the one now followed, and consequently shorter. Nearly one thousand miles will be performed by railroad. This will be passed in one-third of the time it takes a steamer to make the same distance. By reducing the distance to be run by steamers, lighter and swifter boats can be used. By this means, the passage could be shortened by at least two, and probably three days. If this fact can be proved, or should be admitted, then the success of the plan is proved. The saving of two days to the business or travelling community in a voyage to Europe, is a matter of such importance that this alone would give it the preference over all others. This route too would reduce very materially the cost of the trip. The distance by railroad could be passed at a cost not exceeding two cents per mile. The steamers would undoubtedly carry at a less rate, as the cost of the voyage would be essentially reduced by diminishing the distance to be run. The cost of a passage from New York to Boston by steamboat and railroad, is less than two cents per mile, and there can exist no reason why, with a sufficient number of passengers, a voyage across the Atlantic by this mixed mode of conveyance should be at a higher rate. If this scheme should be carried out we believe that the cost of the voyage would be reduced one-half.

A voyage by this route would be much safer than by the route now pursued. It is well known that the liability of a steamer to accidents is confined to those parts of her route lying within the Irish Channel and on the coast of Maine and Nova Scotia.

These dangers would be entirely avoided by the route advocated. It would prove the quickest, safest, pleasantest, cheapest, and consequently the successful route against all rivals.

This being admitted, the next question is, can it be opened? To secure this, all that is wanting is the construction of a railroad from Waterville, Maine, to the proper point in Nova Scotia. Now, we have every reason to believe that that portion of the line in New Brunswick and Nova Scotia would be undertaken by the Provincial governments. The feeling in the Provinces in favor of railroads is very strong. They are looked upon as the only means by which their former prosperity can be restored. The only reason why their construction has not been engaged in has been the want of a feasible scheme. They have been laboring under the hallucination that the Halifax and Quebec road was the proper work to engage their efforts. This project, utterly impracticable in itself, and unjustifiable upon any mode of reasoning, kept possession of their mind and embarrassed all their movements. It was looked upon as a work national in its character, and called for by the position of these Provinces in relation to the Canadas. For a similar reason it was believed that the home government would aid a work, the design of which was to unite into harmony conflicting interests, and Provinces hostile to each other. This hope is now entirely cut off, and with it the attention of the people of the Lower Provinces is now turned towards the only scheme which is practicable in itself, and which will secure the end which they have endeavored to attain. The carrying out of the proposed road will open to the Provinces the cities of the United States, their natural and appropriate markets, the want of which is the great cause of the depression which exists there. It will place them on the line of the great route of travel between Europe and America, and attract to them population and wealth, and secure the development of their resources to their fullest extent. These results will be fully appreciated there, and we have no doubt will secure, not only the prompt co-operation of the Provincial authorities, but of the home government, which will not suffer itself to lose so favorable an opportunity as this to regain the favor and good will of her discontented Provincial subjects. The success of this portion of the line we may count as certain. The most difficult part of accomplishment we think is that from Bangor to the eastern line of the State. This portion of it is almost an entire wilderness, and the country traversed can afford no aid to the work. But if it can be made certain that the Provincial line could be built, we think there can be no doubt that the roads extending east from New York would make common cause in favor of the line in Maine, and extend the necessary aid to its construction. Such would be for their interest, and such we have no doubt would be the result.

Such are some of the arguments in favor of this route, and the reasons that lead us to expect that it will speedily be opened. We believe the scheme justifiable and attainable as a private enterprise alone. But when the public shall fully understand its merits and importance, an impulse will be given to it such as is communicated, where public sentiment is unanimous, which not only demands results, but furnishes the means to accomplish them.

A convention to take into consideration this project is to be held in Portland on the 31st instant. Below we give the Circular inviting attendance and co-operation.

CIRCULAR.

The plan of extending a line of railway through the State of Maine to the Lower British Provinces, and to some good harbor on the eastern coast of Nova Scotia, has long been regarded as a measure of the highest importance to the commercial interests of this continent and Europe. Events which have occurred on this side the Atlantic within the last few years, both in the British Provinces and the U. States, have led the most discerning minds of both countries to concur in the belief, that the time is rapidly approaching, if not already arrived, when an effort should be made, by all parties interested in such a result, towards its consummation.

The region of this continent lying to the east of Lake Champlain and the Hudson River, and between the River and the Gulf of St. Lawrence and the Atlantic Ocean—in reference to its geological features, its topographical and physical geography—presents many striking characteristics, inviting the attention of the naturalist and the scientific inquirer. Its soil, climate and commercial advantages, indicate that it possesses the greatest natural capacity for the development of the highest physical and social condition of man, and point it out as the future abode of the most enterprising portion of the race.

This region of country from the circumstances of its early settlement, and the political changes it has undergone, has witnessed the most exciting scenes in the history of this continent, has been the theatre of the fierce contests of different races, and shared in all the eventful changes with which for more than two centuries the nations of Europe have been disturbed.

The final predominance of the English race throughout this region had scarcely become established, when new relations awakened an equally embittered hostility between England and her former subjects, leading both countries into bloody and destructive wars.

The spirit of peace has at last prevailed—national animosities, sectional and political hostility have disappeared between the English races, since the establishment of the boundaries of Maine and Oregon, and the contests of war have been succeeded by a noble and generous rivalry for the promotion of the arts of peace.

The introduction of the steamship and the railway has made former enemies friends, and the citizens of Montreal and Portland, of Halifax and Boston, of St. John and New York, are to all intents and purposes one people, speaking a common language and struggling for the same destiny.—National hostility has given way to commercial and social intercourse, and under whatever form of government they may hereafter exist, they can never again become hostile or unfriendly.

An effort is now made to increase the means of communication between different parts of this extended region. In aid of this purpose, a Convention is to be held at Portland on the 31st of July, instant, at 11 o'clock in the forenoon, at the City Hall, at which time and place it is proposed to consider the various schemes which have been proposed for the accomplishment of this result. The immediate object of this Convention is, to agree upon the most feasible plan for prolonging the line of railway from the State of Maine to the Lower British Provinces, to some good harbor best fitted to become the entrepot and terminus for the most direct line of trans-Atlantic navigation, and form a connection by railway between the Upper and Lower British Provinces through the State of Maine.

Such a line of railway extended from New York and Montreal to a point of connection in Maine, and from thence to Halifax, would undoubtedly prove the most popular and most frequented highway for all travellers between Europe and America, and a great thoroughfare both for the old and new world. The Atlantic can be most readily crossed from the eastern coast of Nova Scotia to the western coast of Ireland, thence by railway to Dublin, and by steam to Holyhead, whence the Menai Strait is crossed by the Britannia tubular bridge, and so to London or Liverpool, or any part of Great Britain or the continent of Europe. One great central line for European communication once laid down, into which the various branch lines could enter on either side as required, connected also by lines of railway with Montreal and Quebec, would secure

a system of railways surpassing in value and importance any that has yet been proposed.

Whatever views may have been formerly entertained on this subject by the people of the several British American Provinces, we have reason to believe they are now unanimous in maintaining the opinions above expressed.

At a meeting of the Chamber of Commerce and citizens of St. John, held on the 6th of July, instant, to consider what steps should be taken to further the proposed line of railway through this Province, in connection with a Grand Trunk line from Halifax to Boston, it was

Resolved, That this meeting feel the most lively interest in the establishment of a line of railway from the frontier of the United States to Halifax, through this Province by Calais, St. John and Shediac; and further resolved, that as the only portion of the proposed line from the United States, eastwardly, now surveyed, is between Calais and this city; a petition be presented to the Executive to cause a preliminary survey of this line to be made during the present session, upon the understanding that the State of Maine will survey the line, westwardly, from Calais to Bangor.

Resolved, That a committee be appointed to prepare the foregoing petition, and take such other steps as may be expedient for carrying out the subject matter of the same.

Resolved, That the committee be appointed to authorise delegates to attend the convention in Portland, on the 31st inst., for the purpose of conveying to the citizens of the United States, engaged in the undertaking, the determination of this meeting to use its utmost endeavors to complete a line of railway through the Province of New Brunswick, to connect Halifax with the United States.

Similar measures have been adopted at Halifax, and it is believed that the same feeling prevails with the government and people of Canada.

At a public meeting of the citizens of Portland, held on the 11th instant, the undersigned were appointed a committee of their fellow citizens to consider what steps are necessary to be taken in furtherance of a proposed line of railway from the State of Maine to the Lower British Provinces, and to take such further measures as may be necessary in view of the proposed convention in aid of said project, to be holden at Portland on the 31st of July instant.

They were also directed to take charge of all measures necessary to carry out the subject matter of the same, to invite the attendance upon such convention, of the Governor and Council, and the Legislature of Maine—delegates from the various railroad companies, and the friends of public improvement throughout the country.

The undersigned reiterate the expression made at said meeting of their most lively interest in every measure calculated to advance the project of extending a grand trunk line of railway from the State of Maine to the Lower British Provinces, and most cordially approve the plan of having a survey from Bangor to St. John City, or to the boundary of Maine, made forthwith, at the expense of the State, for the reasons, and in accordance with the petitions to this effect, pending before the Legislature of Maine.

The undersigned are happy in being able to say that assurances just received from St. John, leave no doubt on their minds, that an immediate survey will be ordered by the Executive of New Brunswick, of that portion of the line from St. John City to the boundary of Maine.

Under the instructions given us by the public meeting in this city—and with a view to carry out the plan proposed—the undersigned invite your attention to the subject matter of this communication, and respectfully request your attendance at said convention.

We are encouraged to believe, that the completion of this great work, can be secured within a reasonable time, without withdrawing any portion of the means of the people along the line, wanted by them for the ordinary purposes of business. A liberal grant of public lands, and of public credit, from Nova Scotia, New Brunswick and Canada, equal to that tendered in aid of the Quebec and Halifax railway, with suitable compensation from the British and American governments for the carrying of the mails, will we believe, at once invite

into it private capital from Europe and the commercial interests of this country, fully adequate to its early completion.

But whatever may be the pecuniary merits of the enterprise, it has social and commercial relations of the most delicate and patriotic character. Whatever shall tend to allay national prejudice, and harmonize national differences, contributes to advance the highest interests of humanity, and promote the welfare of the race.

The most sublime spectacle which the history of the world has ever disclosed, is being enacted in our day by the advancement of the English race, towards universal supremacy—a supremacy not maintained by tyranny or force, but resting upon the solid foundations of intellectual superiority—a love of freedom and social order. Regardless of artificial lines of demarkation, or of the political divisions of this continent, we desire that intercourse between those who speak a common language, and are striving for the same destiny, shall be as free as the thoughts of the mighty race who have become the masters of the world.

JOHN A. POOR,
CHARLES Q. CLAPP,

ALLEN HAINES,
JOSHUA DUNN,

T. C. HERSEY,
CHARLES JONES,

DANIEL F. EMERY,
THOMAS CUMMINGS,

JOHN M. WOOD,
WM. PAINE,

P. BARNES,
Portland, July 13, 1850.

JAMES B. CAHOON,
A. C. MORTON,

JOHN RUSSELL,
JOHN NEAL,

A. W. H. CLAPP,
WOODBURY STORER,

GEO. R. DAVIS,
H. B. MCCOBB,

LUTHER JEWETT,
JOHN APPLETON,

ABNER SHAW.
Committee.

Missouri.

The Pacific Railway.

We learn from Mr. Allen, the President of the Pacific Railroad Company, that the Chief Engineer has returned to the city from his reconnoissance of the entire route from St. Louis to the western borders of the State. He found the ground as favorable, in the general, as he anticipated, and thinks the road can be constructed at a very reasonable cost. He reports that the best feeling towards the enterprise prevails among the people along the entire route, and that they will subscribe liberally as soon as the work is fairly begun. We understand that an accurate survey of the route will be made at the earliest practicable period, and that a considerable force will be placed upon the road early next spring. It is expected that from 50 to 100 miles will be completed next year.—*St. Louis Intel.*

Railroad Negotiations and Securities.

The most important transactions in railroad negotiations since our last have been the sale of \$234,000 of 10 per cent. Milwaukee city bonds, \$110,000 Shelby County, Ohio, 7 per cent. bonds, and the purchase of 11,000 tons of iron by the Ohio and Pennsylvania railroad. Some other negotiations have been made which have not yet been made public. The Milwaukee bonds have ten years to run, and were sold at a small advance. The price obtained for the Shelby County bonds has not been made public.

While negotiations are pending it may be advisable to avoid publicity. Indeed, secrecy may be essential to the success of a negotiation. But we are satisfied that it is decidedly for the interest of railroad companies after the sale is completed that the price obtained should be made public, for reasons which only require to be stated to be apparent.

The high price which the stocks of the general government and the States in best credit commanded, shows the abundance of money. The State debt of Ohio amounts to about \$16,000,000, and her 6 per cent stocks are at a premium of from 12 to 15 per cent., while the 7 per cent. bonds of some of

her richest counties are at an equal amount below par. Now this inequality is not based upon the intrinsic value of the securities, for in fact the county bond of the two is the most secure, and certain to be paid. The security of the State debt rests upon its public faith. Should the State refuse to pay, the lender has no remedy. The bonds of the counties rest upon the same public faith, and the lender may collect his debt by law if the county refuses to pay. The holder of the county security has all the security of the holder of the State stocks, and in addition, may enforce his claim at law. But the purchaser admits that the security in both cases is perfect; but he says to the seller "your county bonds are not known in market. Men will not purchase what they cannot readily sell. Until your securities are known, and until they have acquired a character in the market, and until their convertibility at all times is established, you must expect to sell at a discount. The difficulty is not so much in the goodness of the security as in the fact that it is not known to be so."

This is all very true. A good illustration of this may be found in the price that the Portland city bonds command, compared with the bonds of the city of Milwaukee. The former has issued bonds to the amount of \$1,000,000, and is now before the Legislature of Maine for liberty to issue \$500,000 more to aid the Atlantic and St. Lawrence railroad. Milwaukee has issued \$234,000 10 per cent. bonds to aid the Milwaukee and Mississippi railroad.—The latter is the larger city of the two, and is growing much faster than Portland. Yet, the 6 per cent. Portland city bonds are sought for at par, which is all that can be obtained for the 10 per cent. Milwaukee bonds. The cause of this great disparity in market value, is owing to the fact that the character and credit of the city of Portland is known to the business and monied men, while that of Milwaukee is not. As soon as the latter shall become equally well known in the circles of business her securities will stand equally well.

So long, therefore, as western men continue to bring into our market securities as good as those that thus far have been offered, it is for their interest to call public attention to them in every manner possible. If bonds are sold for 75 cents on the dollar that should bring par, the sooner this is made public the better. The simple announcement of such a sale will attract attention and purchasers; competition will carry up the price, and investigation and inquiry will secure to every security that position in the money market that it is entitled, from its inherent value, to maintain.

It may be said that the extremely low rate at which companies may be compelled to sell their securities would injure their credit, if made known. It is a full answer to this to say, if a company cannot get along without paying exorbitant shaves the sooner it stops the better. Let it wait till it can get money on reasonable terms. Its prosecution is not justified on any other ground. A railroad cannot afford to pay anything more than simple interest, any more than can a merchant, and succeed. But the Western roads are entitled to credit upon the securities they offer. Their care should be to make the value of them known, and a good price will necessarily follow.

Connecticut.

The city of Hartford has subscribed \$500,000 to extend the Hartford and Willimantic railroad to Boston, either by way of Providence or the Norfolk County railroad.

Ohio and Pennsylvania Railroad.

Gen. William Robinson, Jr., the President, and Solomon W. Roberts, Esq., the Chief Engineer, of the Ohio and Pennsylvania Railroad Company, have concluded their negotiations for the purchase of eleven thousand tons of rails, at 60 lbs. per yard, to lay the road from Pittsburgh to Massillon. Of this amount, 3,000 tons are to be made at Brady's Bend, on the Allegheny river, fifty miles above Pittsburgh, and are to be delivered on the Ohio river, between Pittsburgh and Beaver, early next spring, so that that portion of the road may be opened as early in the season as practicable. The remaining 8,000 tons will be foreign iron, which is contracted for to be delivered in this country in time to permit the opening of the road from Pittsburgh to Massillon, and also to Cleveland, in the autumn of next year. The terms upon which these negotiations have been effected are said to be highly favorable to the company.

Railroad Iron.

CONTRACTS made by the subscribers, agents for the manufacturers, for the delivery of Railway Iron, at any port in the United States, at fixed prices, and of quality tried and approved for many years, on the oldest railways in this country.

RAYMOND & FULLERTON, 45 Cliff st.

Railroad Iron.

B. O. Railway Tires, Railway Wheels,
Scotch Pig Iron, Tin Plates and Banca Tin,
Muntz Patent Metal Sheathing,
Baltimore Copper.

Contracts for Rails made on behalf of the manufacturers, for delivery at any ports in the United States, at fixed prices.

Bowling Tires and Tire Bars and Scotch Pigs imported to order.

Muntz's Ship-sheathing, and a general stock of Tin Plates and Banca Tin in store, and for sale by
RAYMOND & FULLERTON, 45 Cliff st.

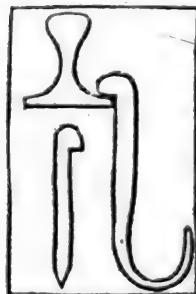
Bowling Iron. Stamped B.O.

Railway Tire Bars Rivet Iron
Locomotive and other Axles Locomotive Frame do
Boiler Plates Bars.

and every other description of this superior Iron.

The subscribers, agents for the sale of Bowling Iron, are prepared to execute orders for importation, especially for railway and machinery uses, with despatch from the manufacturers.

RAYMOND & FULLERTON, 45 Cliff st.

Patent Self-clinching Railroad Spikes.

These spikes have been in use upon various roads for several years, and have met with universal approval by Engineers. They drive in the manner shown, turning themselves, and are therefore not liable to work loose. They will prove of great value to secure the chair.

We are also manufacturing railroad spikes, hook and flat head; wrought chairs, clamps, etc., of superior quality, and are prepared to contract for any pattern or weight upon favorable terms.

SMITH & TYSON,
25 South Charles st., Baltimore Md.

Lovegrove's Patent Cast Iron Water and Gas Pipes.

THE Subscriber, the Inventor and Patentee of the Centrifugal mode of giving form to metallic substances while in a molten state, is preparing to make Cast Iron Water and Gas Pipes, of any dimensions, at prices much lower than they can be made in the old manner, and the pipes warranted to stand a pressure of three hundred pounds to the square inch, and to be soft enough to drill. Steam Engines and all kinds of machinery. Cast Iron Doors and Frames, and Mill Castings of every description, made to order.

THOMAS LOVEGROVE,
Machinist and Founder,

West Falls Avenue, below Pratt st., Baltimore.

Ray's Patent India Rubber Car Springs.

Savannah, Ga., May 22, 1850.

FOWLER M. RAY, Esq.,

Dear Sir: I have no hesitation in saying, after having used on our road your springs and Fuller's, that I consider yours decidedly the best in every particular, and in this opinion I am sustained by all our officers. Fuller's spring has a tendency to split, and also to chafe or abrade by the constant friction on the cast iron plates or disc: and in my opinion is not near so elastic as yours.

Your springs, which have been in use on our road for 12 or 15 months past, and in constant use under both passenger and freight cars, are to all appearances as elastic, sound and good, as when first put in use.

We are now building eighty-five new cars, of which for fifty-sets the springs have been ordered of you.

GEORGE A. ADAMS,

Master Carpenter,

Central Railroad and Banking Co. of Georgia.

Connecticut River Railroad Office,

Northampton, May 4, 1850.

E. CRANE, Esq.,

Dear Sir: It is now about two years since I first tried the experiment of using a set of Ray's India-rubber Springs upon one of our merchandise cars, and although the car has been in constant service since that time, I do not on examination find the slightest difference either in the thickness or elasticity of the material.

The same result has followed wherever we have applied them, either for wheel or draw springs on Engines, Tenders or Cars. At present we use no other; either in replacing old springs or building new cars—and I am perfectly satisfied that for economy, durability, safety, and ease of motion, that Ray's India-rubber is the best article for Springs which has been presented to the public.

Yours respectfully, J. HUNT,
Supt. Connecticut River Railroad.

EDWARD CRANE, Esq.,

Dear Sir: Having applied to cars of the Boston and Worcester Railroad Corporation, Ray's Vulcanized Rubber Springs (where they have been in use for some two years last past), I have had occasion to observe their operation, and am free to say in answer to your inquiries, that they retain their elasticity perfectly during all changes of atmospheric temperature: and are in my opinion a most valuable acquisition to Railroad Cars—are not liable to derangement, as is the case with steel springs; while at the same time it costs less to apply them. Respectfully yours,

D. N. PICKERING,

Supt. Motive Power, Bost. & Wor. Railroad.
Boston, April 15th, 1850.

**NORTHERN RAILROAD, NEW YORK.**

CARS run between Rouses Point and Chateaugay daily, Sundays excepted, as follows:

Leave Rouses Point at 3 1/2 A.M.
Leave Chateaugay at 6 1/2 P.M.

On the arrival of the cars at Chateaugay, stages are in readiness to take the passengers to Ogdensburg, where they arrive the same day.

Passengers leave Ogdensburg in the morning by stage, and take the evening train from Chateaugay to Rouses Point, where they go immediately on board the steamboats which run north and south on Lake Champlain.

Passengers leaving New York in the evening by the way of Whitehall, will arrive at Rouses Point the next night, and the next morning pass directly from the boat to the cars, and arrive at Ogdensburg the same day.

CHARLES L. SCHLATTER, Supt.

Ibbotson, Brothers & Co's CELEBRATED CAST STEEL

AND

Best Cast Steel Royal Improved Files, well known as better adapted for Engineers' and Machinists' purposes than any now in use in the United States.

Every description of Square, Octagon, Flat and Round Cast Steel, Sheet, Shovel and Railway Spring Steel, etc., and Steel to order for any purposes—manufactured at their works in Sheffield—and universally known by the old stamp "Globe."

HENRY J. IBBOTSON, Agent,
218 Pearl st., New York.

NOTICE.

A young man of experience in Surveying wishes a situation on a Railroad as an Assistant. Please apply at this office.

Election of an Engineer.

At a Meeting of the Board of Directors of the Virginia Central Railroad Co. at Charlottesville on the 4th day of June, 1850,

Resolved, That the election of a Chief Engineer in the place of Wm. A. Kuper, whose resignation has been accepted, is postponed to take place in Richmond on Tuesday the 18th of June instant.

A copy from the minutes.

JOHN GARRET, Secretary.

NORRIS' LOCOMOTIVE WORKS, SCHENECTADY, N. Y.

THESE Works are in full operation in Manufacturing to order, Locomotive Steam Engines & Tenders, of the best principle and construction of material, using wrought iron heavy frames with pedestals welded thereto, and all parts of the engine made of the best wrought iron, except cylinders, pumps and boxes—obtaining greater durability, and carrying less weight over the road, than engines constructed of cast iron.

Wrought Iron Tires made any required size, and Tire Bars bent and welded with dispatch.

Chilled Wheels for Cars, Trucks and Tenders, made from the toughest iron.

Driving and Tender and Car Wheels fitted to Axles with Brass Boxes and Springs, and Railroad Machinery generally. Manufactured and for sale by

April 11, 1849. E. S. NORRIS.

American Railway Guide, AND POCKET COMPANION FOR THE UNITED STATES;

CONTAINING Correct Tables, showing the time for starting of trains from all stations, distances, fares, etc., on all the Railway lines in the U. States; also many of the principal Steamboat and Stage routes—accompanied by a complete RAILWAY MAP. Price, single copies 12 1/2 cts., or \$1 per annum. Published on the first of every month, corrected from returns furnished by the Railway Superintendents throughout the Union.

This book has been compiled somewhat on the plan of Bradshaw's Guide, with such improvements in size, form and arrangement as have seemed desirable; and the publisher confidently hopes it will not be found liable to the objections of incompleteness and incorrectness, which have been made, and justly too, against various other similar works heretofore issued.

The subscriber having had the management of the NEW YORK PATHFINDER almost from its commencement, has enjoyed superior facilities in obtaining information relating to the thoroughfares of travel, and is therefore well qualified to prosecute with success the arduous undertaking of furnishing a complete and correct national guide book.

STRINGER & TOWNSEND, General Agents, 222 Broadway: and sold also by Booksellers and Periodical Dealers generally throughout the country; also on all the Railways and Steamboats.

CURRAN DINSMORE, Publisher.

N. Y. Pathfinder Office,
138 Fulton St., New York City.

India-rubber for Railroad Cos.

RUBBER SPRINGS—Bearing and Buffer—Fuller's Patent—Hose from 1 to 12 inches diameter. Suction Hose. Steam Packing from 1-16 to 2 in. thick. Rubber and Gutta Percha Bands. These articles are all warranted to give satisfaction, made under Tyler & Helm's patent, issued January, 1849.—No lead used in the composition. Will stand much higher heat than that called "Goodyear's," and is in all respects better than any in use. Proprietors of railroads do not be overcharged by pretenders.

HORACE H. DAY,

Warehouse 23 Courtlandt street.

New York, May 21, 1849.

FOR SALE—A Second-hand Locomotive Engine and Tender, of about 10 tons weight, in good order, and warranted to perform well. Any company wanting a cheap engine for a passenger or light burden train, will rarely meet with an opportunity so favorable as the present. The engine and tender are in perfect running order, and will be tested to the satisfaction of any one wishing to purchase. Price \$1,500.

Address J. B. MOORHEAD,

Frazer P.O., Chester county, Pa.

P.S.—The Engine can be seen by calling on H. Osmond & Co., Car-builders, Broad st., Philadelphia, September 6, 1849.

Spikes, Spikes, Spikes.

ANY person wishing a simple and effective Spike Machine, or a number of them, may be supplied by addressing J. W. FLACK, Troy, N. Y. March 6, 1850.

Great American Engineering

AND MECHANICAL WORK, just published in medium folio, 75 cts. to Subscribers, One Dollar to non-subscribers.

Part VI of "Specimens of the Stone, Iron and Timber Bridges, Viaducts, Tunnels, &c. &c. of the United States Railroads." By George Duggan, Architect and Civil Engineer.

The present part contains beautifully executed plans, elevations and sections of the Timber Bridge (three spans of 150, and one span of 160 feet) across the Delaware at Saw Mill Rift, on the line of the N. York & Erie R. R., with the specifications, estimates, bills of timber, iron, etc.

N.B.—With the present (6th) part, are given specimen Plates of the **APPENDIX**, (or "THEORETICAL AND PRACTICAL TREATISE ON BRIDGE BUILDING, etc. etc.") consisting of plans, elevations, sections and details of a cast iron oblique arch, 130 feet span, across Fairfield st. Manchester, on the line of the Manchester and Birmingham Railroad. Also a specimen sheet of the letter press of the **APPENDIX**, consisting of an introductory article on the *Application of Iron to Railroad Structures*.

"It is a work that was a great desideratum, and must prove of great benefit to the engineering profession generally, and especially to the tyro in practical engineering and mechanical knowledge; in truth it strikes us, that it would require years of labor and patient toil on the part of a young engineer to prepare the drawings, and collect the information that will be embodied in this work, and can now be secured for the trifling sum of \$9"—[Scientific Amer. March 16, 1850.]

In connection with this subject (Iron Railroad Structures) we take occasion to call attention again to Mr. Duggan's valuable and expensive publication, exhibiting drawings, with full descriptions of the various stone, iron and wooden bridges, viaducts, tunnels, culverts, etc., of all the Railroads in the United States. Mr. Duggan is an accomplished Architect and Civil Engineer, who came from Ireland to this country to exercise his profession; but finding Railroad construction here, in many respects, different from that he had been accustomed to in Europe, he applied himself to the study of our system; and the fruits of his researches and investigations embodied in this work, are well calculated to meet the exigencies of engineers, and to assist draughtsmen, bridge builders, mechanics and students.—[N. Y. Journal of Commerce, Feb. 14, 1850.]

Published by **GEORGE DUGGAN**,
300 Broadway, New York.

To whom all communications should be addressed, and subscriptions forwarded.

RAILROAD CAR AND COACH TRIMMINGS.

Doremus & Nixon,
IMPORTERS AND FURNISHERS

HAVE FOR SALE
Plain Garnet Plush. Fig. Garnet Plush (Butterfly pat.
"Crimson " "Crimson " (Elegant.
"Scarlet " " " " (Gen. Taylor.

BROCATELLES.

Crimson Silk Brocatelles. Gold and Maroon do.
Gold and Blue " " Brown "
Silk and Wool " of every color.

MOQUETTS,

Of elegant designs and colors.

GERMAN CLOTH FOR CAR LININGS.

The most beautiful goods ever shown in this country, and the subscribers are the sole agents for the sale of them.

Oil cloths Enamelled with Gold. These goods can be
" " Silver. furnished in any
Do. Silver ground velvet printed. dimensions req'd.

CURLED HAIR

Of every description and quality.

JNO. W. A. STRICKLAND, Agent.
New York, 1850. 1y16

Stickney & Beatty,
DEALERS IN IRON AND IRON MANUFACTURERS.

AGENTS for the Balt. City Rolling Mill, from which establishment they are prepared to furnish Elliott's round, square, and flat bar iron, puddled and charcoal boiler plates and billet iron—also agents for the sale of the Laurel and Maryland (Balt.) charcoal forge pig irons, Balt. hard iron for chilling wheels, anti-rust nails, Cast-iron foundry iron, boiler blooms from the Caledonian works, Wm. Jessop & Son's cast steel, Cleiman's blister steel and nail rods, hoop, band, sheet, oval and common English iron.

No. 18 and 20 South Charles st., Baltimore.

Fire Brick.

THE Subscribers have constantly on hand Rafford's Stourbridge, Oak Farms Stourbridge, Lister, Wortley, Red and White Welsh Fire Bricks, common and fancy shapes. Also,

ROOFING SLATES,

from the best Welch quarries, and of all sizes. Also,

COAL,

of all kinds—Liverpool Orrell and Cannel, Scotch, New Castle, Pictou, Sidney, Cumberland, Virginia, and all kinds of Anthracite coals. Also,

Pig Iron, Salt, etc., etc., for sale at the lowest market price. Apply to

SAMUEL THOMPSON & NEPHEW,
275 Pearl and 43 Gold Sts., New York.

November, 23, 1849.

FAIRBANKS' RAILROAD SCALES.—THE subscribers are prepared to construct at short notice, *Railroad and Depot Scales*, of any desired length and capacity. Their long experience as manufacturers—their improvements in the construction of the various modifications, having reference to strength, durability, retention of adjustment, accuracy of weight and dispatch in weighing—and the long and severe tests to which their scales have been subjected—combine to ensure for these scales the universal confidence of the public.

No other scales are so extensively used upon railroads, either in the United States or Great Britain;—and the managers refer with confidence to the following in the United States.

Eastern Railroad.	Boston & Maine Railroad.
Providence Railroad.	Providence and Wor. Road.
Western Railroad.	Concord Railroad.
Old Colony Railroad.	Pitchburg Railroad.
Schenectady Railroad.	Syracuse and Utica Road.
Balt. and Ohio Railroad.	Baltimore and Susq. Road.
Phila. & Reading Road.	Schuylkill Valley Road.
Central (Ga.) Railroad.	Macon and Western Road.
	New York and Erie Railroad.

And other principal Railroads in the Western, Middle and Southern States.

E. & T. FAIRBANKS & CO.

St. Johnsbury, Vt.
Agents, } FAIRBANKS & Co., 89 Water St., N. York.
A. B. NORRIS, 196 Market St. Philadelphia.
April 22, 1849. 1y*17

STABILITY—SECURITY—PERPETUITY.
Mutual Life Insurance Co. of New York.

No. 35 WALL STREET.

A MILLION OF DOLLARS

Securely invested in Bonds and Mortgages on real estate in this city and Brooklyn, and stocks of the State and City of New York and United States Government.

The company declared a dividend of profits of fifty-two per cent. on all existing policies on the 31st of January, 1848.

All the Profits are Divided Among the Insured.
Persons may effect insurance on their own lives and the lives of others.

A married woman can insure the life of her husband, the benefits of which are secured by law for the exclusive use of herself or children.

Clergymen and all others dependent upon salaries or their daily earnings are specially invited to avail themselves of a resource whereby their surviving families may be secured from the evils of penury.

Pamphlets explanatory of the principles of Mutual Life Insurance, and illustrating its advantages, with forms of application, may be obtained at the office of the company, 35 Wall street, or of any of its agents.

TRUSTEES.

Jos. B. Collins,	Abraham Bininger,
Wm. J. Hyalop.	Alfred Edwards,
R. H. McCurdy,	Wm. Betts,
Fred. S. Winston,	Joseph Blunt,
C. W. Faber,	Isaac G. Pearson,
John P. Yelverton,	Henry Wells,
Theo. Sedgwick,	Wm. Moore,
Stacy B. Collins,	George R. Clark,
John H. Swift,	Jona. Miller,
John Wadsworth,	David A. Comstock,
S. M. Cornell,	Robert Schuyler,
Gouv. M. Wilkins,	James Chambers,
John V. L. Pruyn,	Joseph Tuckerman,
Jas. S. Wadsworth,	Moses H. Grinnell,
Charles Ely,	Wm. J. Banker,
John C. Cruger,	John M. Stuart,
Charles King,	Francis S. Lathrop,
Alfred Peil,	Nathaniel Hayden.

JOSEPH. B. COLLINS, President.
ISAAC ABBATT, Secretary. 3m2

NOTICE TO**Superintendents of Railroads.**

TYLER'S PATENT SAFETY SWITCH.—The undersigned would respectfully call their attention to his Patent Safety Switch, which from long trial and late severe tests has proved itself perfectly reliable for the purpose for which it was intended. It is designed to prevent the train from running off when the switch is set to the wrong track by design or accident. The single rail or gate switch is established as the best and safest switch for the ordinary purpose of shifting cars from one track to another, but it is liable to the serious evil of having one track open or broken when connected with the other. My improvement entirely removes this evil, and while it accomplishes this important office, leaves the switch in its original simplicity and perfection of a plain unbroken rail, connecting one track with the other ready for use.

The following decision of the Commissioner of Patents is respectfully submitted to Railroad Engineers, Superintendents, and all others interested in the subject.

P. B. TYLER.

(COPY.)

UNITED STATES PATENT OFFICE,

Washington City, D.C., April 28th, 1846.

SIR: You are hereby informed that in the case of the interference between your claims and those of Gustavus A. Nicolla, for improvements in safety switches—upon which a hearing was appointed to take place on the 3d Monday in March, 1846, the question of priority of invention has been decided in your favor. Inclosed is a copy of the decision. The testimony in the case is now open to the inspection of those concerned.

Yours respectfully,
EDMUND BURKE,
Commissioner of Patents.

To Philos B. Tyler.

Any further information may be obtained by addressing P. B. TYLER, Springfield, Mass., or JOHN PENDLETON, Agent, 149 Hudson St., New York.

Coal.

CUMBERLAND SEMI-BITUMINOUS COAL
superior quality for Locomotives, for sale by

H. B. TEBBETTS,
No. 40 Wall St., New York.

May 12, 1849.

1m19

PHILADELPHIA CAR MANUFACTORY,

CORNER SCHUYLKILL 2d AND HAMILTON STS.,

SPRING GARDEN, PHILADELPHIA CO., PA.

Kimball & Gorton,

Having recently constructed the above works, are prepared to construct at short notice all kinds of

RAILROAD CARS, Viz:

Passenger Cars of all classes—Open and Covered Freight and Express Cars—Coal Cars—Hand Cars & Trucks of all descriptions.

They are also prepared to furnish Chilled Wheels of any pattern. Car Wheels & Axles fitted and furnished. Snow Ploughs and Tenders made to order. Steel and other Springs always on hand.

All orders will be filled at short notice, and upon as good terms as at any other establishment in the country. Omnibuses from the Exchange run within one square of the manufactory every 10 minutes during the day.

Philadelphia, June 16, 1849. 1y26

C. W. Bentley & Co.,

IRON Founders, Portable Steam Engine Builders and Boiler Makers, Corner Front and Plowman Sts., near Baltimore St. Bridge,

BALTIMORE, MARYLAND.

Their Engines are simple in their construction, compact and durable; they require no brick work in setting them, and occupy but a small space (a six horse power engine and boiler, standing on a cast iron plate of three by six feet.)

They also manufacture Major W. P. Williamson's new oscillating Engine; a superior article, combining cheapness and simplicity (one of which may be seen in operation at their shop.) Both of these engines are adapted to any purpose, where power is required, and may be made of any capacity; and for economy in use of fuel are unsurpassed.

All kinds of machinery made to order. Steam Generators, Force Pumps, Wrought Iron Pipes and Fittings for Steam, Water, Gas, etc., constantly on hand, Baltimore, June 6, 1849.

CORROSIVE SUBLIMATE.

THIS article now extensively used for the preservation of timber, is manufactured and for sale by **POWERS & WEIGHTMAN**, manufacturing Chemists, Philadelphia.

Jan. 20, 1849.

ENGINEERS.**Atkinson, T. C.,**

Alexandria and Orange Railroad, Alexandria, Va.

Bancks, C. W.,

Civil Engineer, Vicksburg, Miss.

Buckland, George,

Troy and Greenbush Railroad.

Clement, Wm. H.,

Little Miami Railroad, Cincinnati, Ohio.

Cozzens, W. H.,

Engineer and Surveyor, St. Louis, Mo.

Alfred W. Craven,

Chief Engineer Croton Aqueduct, New York.

Davidson, M. O.,

Eckhart Mines, Alleghany Co., Maryland.

Fisk, Charles B.,

Cumberland and Ohio Canal, Washington, D. C.

Felton, S. M.,

Fitchburgh Railroad, Boston, Mass.

Floyd-Jones, Charles,

South Oyster Bay, L. I.

Gzowski, Mr.,

St. Lawrence & Atlantic Railroad, Montreal, Canada.

Gilbert, Wm. B.,

Rutland and Burlington Railroad, Rutland, Vt.

Grant, James H.,

Nashville and Chattanooga R. R., Nashville, Tenn.

S. W. Hill,

Mining Engineer and Surveyor, Eagle River, Lake Superior.

Holcomb, F. P.,

Southwestern Railroad, Macon, Ga.

Johnson, Edwin F.,

New York and Boston Railroad, Middletown Ct.

Latrobe, B. H.,

Baltimore and Ohio Railroad, Baltimore, Md.

Miller, J. F.,

Worcester and Nashua Railroad, Worcester, Mass.

Morris, Elwood,

Schuylkill Navigation, Schuylkill Haven, Pa.

Morton, A. C.,

Atlantic and St. Lawrence Railroad, Portland, Me.

McRae, John,

South Carolina Railroad, Charleston, S. C.

Nott, Samuel,

Lawrence and Manchester Railroad, Boston.

Prichard, M. B.,

East Tennessee and Georgia R. R., Cleveland, Tenn.

Roebling, John A.,

Trenton, N. J.

W. Milnor Roberts,

Bellevue and Indiana Railroad, Marion, Ohio.

Roberts, Solomon W.,

Ohio and Pennsylvania Railroad, Pittsburgh, Pa.

Sanford, C. O.,

South Side Railroad, Virginia.

Schlatter, Charles L.,

Northern Railroad (Ogdensburg), Malone, N. Y.

Sours, Peter,

Rahway, New Jersey.

Stark, George.,

Bost., Con. and Mont. R. R., Meredith Bridge, N. H.

Steele, J. Dutton,

Pottstown, Pa.

Trautwine, John C.,

Panama Railroad—Address through office of Panama Railroad Co., 78 Broadway, N. Y.

Trimble, Isaac R.,

Philad., Wil. & Baltimore Railroad, Wilmington, Del.

Tinkham, A. W.,

United States Fort, Bucksport, Me.

Thomson, J. Edgar.,

Pennsylvania (Central) Railroad, Philadelphia.

Troost, Lewis,

Alabama and Tennessee Railroad, Selma, Ala.

Whipple, S.,

Civil Engineer and Bridge Builder, Utica, N. Y.

Williams, E. P.,

Auburn and Schenectady Railroad, Auburn, N. Y.

Williams, Charles H.,

Milwaukee, Wisconsin.

HOTELS.**MANSION,**Corner of Maine and Exchange Streets,
P. DORSHIMER. BUFFALO.**GUY'S**United States Hotel,
(Opposite Pratt street Railroad Depot.)
BALTIMORE.

JOHN GUY.

WILLIAM GUY.

American Hotel,Pratt street, opposite the Railroad Depot,
BALTIMORE.HENRY M. SMITH.....Proprietor.
Late of the Exchange & St. Charles Hotels, Pittsburg.**Washington Hotel,**

BY JOHN GILMAN,

\$1 Per Day.

No. 206 Pratt street, (near the Depot.)
BALTIMORE.**Fountain Hotel,**

LIGHT STREET, BALTIMORE,

P. THURSTON.....Proprietor.

Barnum's City Hotel,

MONUMENT SQUARE, BALTIMORE.

This Extensive Establishment, erected expressly for a Hotel, with every regard to comfort and convenience, is situated in the centre and most fashionable part of the city, and but a few minutes' walk from the Railroad Depots and Steamboat Landings.

The House has lately undergone a thorough repair, embracing many valuable improvements, and will accommodate 250 Guests. BARNUM & CO.

JONES' HOTEL,NO. 152 CHESTNUT STREET,
PHILADELPHIA.

BRIDGES & WEST, Proprietors.

DUNLAP'S HOTEL,On the European Plan,
NO. 135 FULTON STREET,
Between Broadway and Nassau St.,
NEW YORK.**BUSINESS CARDS.****J. T. Hodge**Will attend to the examination of mining tracts near Lake Superior, and prepare Reports and Maps.
Address, during the Summer,
Ontonagon Postoffice, Lake Superior.**Cumberland Steam Coal,**FROM THE
FROSTBURG MINES, MD.

H. A. TUCKER,

Agent of Frostburg Coal Co.
No. 50 Wall Street, New York.**Eaton, Gilbert & Co.,**Railroad Car, Coach and Omnibus Builders,
TROY, N. Y.**Nathan Caswell,****METAL BROKER, 69 WALL ST., N. Y.**

For the Purchase and Sale of Railroad Iron (new and old,) Boiler Plates, Pig and Bar Iron, Lead, Tin, Copper, Spelter, etc. Refers to

Messrs. Boorman, Johnston, & Co., New York.

" Grinnell, Minturn & Co., "

" Barston, Pope & Co., "

" Earpa & Brink, Philadelphia.

" E. Pratt & Brother, Baltimore.

John Barstow, Esq., Providence.

Lewis Bullard, Esq., Boston.

February 9, 1880.

6m*

United States Railroad Guide and Steamboat Journal.

CONTAINING OFFICIAL TIME ADVERTISEMENTS, Tables of Stations, Distances, Fares, Time, etc., with much miscellaneous matter for the travelling public. Price 12 cents a copy. Yearly subscription \$1. Published at 43 Ann street, New York.

J. & Riley Carr,Manufacturers of Cast, Shear, German and Blister
STEEL,Of all Descriptions, Warranted Good.
BAILEY-LANE WORKS, SHEFFIELD.**R. S. STENTON, Agent,**

NO. 20 CLIFF ST., NEW YORK.

STEEL AND FILES.**R. S. Stenton,**

20 CLIFF STREET, NEW YORK,

AGENT FOR

J. & Riley Carr'sBAILEY-LANE WORKS, SHEFFIELD,
Manufacturers of Cast, Shear, German and Blister
STEELOf all descriptions. Warranted Good
FILES.

Manufacturers of Machinists' Warranted Best Cast Steel Files, expressly for working upon Iron and Steel, made very heavy for recutting.

A full Stock of Steel and Files at all times on hand. 6m4

Walter R. Johnson,

CIVIL AND MINING ENGINEER AND ATTORNEY for Patents. Office and Laboratory, F St., opposite the Patent office, Washington, D. C.

Dudley B. Fuller & Co.,IRON COMMISSION MERCHANTS,
No. 139 GREENWICH STREET,
NEW YORK.**Manning & Lee,**GENERAL COMMISSION MERCHANTS,
NO. 51 EXCHANGE PLACE,
BALTIMORE.

Agents for Avalon Railroad Iron and Nail Works, Maryland Mining Company's Cumberland Coal 'CED'—'Potomac' and other good brands of Pig Iron.

Cop Waste.

CLEAN COP WASTE, suitable for cleaning Railroad, Steamboat and Stationary Engines, constantly on hand and for sale by

KENNEDY & GELSTON,

54 Pine St., New York.
October 27, 1849, 3m**Ranstead, Dearborn & Co.,**MANUFACTURERS OF
LOCOMOTIVE CRANKS AND CAR AXLES,
ALSO**WROUGHT IRON SHAFTING,**And All Kinds of Hammered Shapes.
Forge at Commercial Point, Dorchester,
Office 25 Foster's Wharf, opposite No. 211 Broad St.
BOSTON.**Henry J. Ibbotson,**IMPORTER of Sheffield and Birmingham Goods.
Also, Agent for the Manufacture of Telegraph Wire.
218 PEARL ST., NEW YORK.**Cumberland, (Md.,) Coals for Steaming, etc.**ORDERS RECEIVED FOR AND FILLED
by J. COWLES, 27 Wall St., N. Y.

**Railroad Car Manufacturer's
Furnishing Store.**
F. S. & S. A. MARTINE,
IMPORTERS AND MANUFACTURERS OF
**RAIL ROAD CAR &
CARRIAGE LININGS,**
PLUSHES, CURTAIN MATERIALS, ETC.,
113 WILLIAM ST., NEAR JOHN.
3-4 and 6-4 Damasks, Union and Worsteds; Mo-
reens, Rattinets, Cloths, Silk and Cotton Velvets,
English Bunting

To Engineers and Surveyors.
E. BROWN AND SON Mathematical inst. mak-
ers No. 27 Fulton Slip, New York, make and keep
for sale, Theodolites, Levelling inst., Levelling rods,
Surveyors Compasses, and Chains, Cases of Mathe-
matical drawing insts. various qualities, together with
a general assortment of Ivory Scales and small insts.
generally used by Engineers.

**Samuel Kimber & Co.,
COMMISSION MERCHANTS**
WILLOW ST. WHARVES, PHILADELPHIA.
AGENTS for the sale of Charcoal and Anthracite
A Pig Iron, Hammered Railroad Car and Locomo-
tive Axles, Force Pumps of the most approved con-
struction for Railroad Water Stations and Hydraulic
Rams, etc., etc.
July, 27, 1849.

James Herron, Civil Engineer,
OF THE UNITED STATES NAVY YARD,
PENSACOLA, FLORIDA.,
PATENTEE OF THE
HERRON RAILWAY TRACK.
Models of this Track, on the most improved plans,
may be seen at the Engineer's office of the New York
and Erie Railroad.

To Railroad Companies.
—WROUGHT IRON WHEELS—
SAFETY AND ECONOMY.
NORRIS' LOCOMOTIVE WORKS,
SCHENECTADY, NEW YORK,
Are Manufacturing Wrought Iron Driving, Truck,
Tender, and Car Wheels—made from the best Ameri-
can Iron. Address **E. S. NORRIS.**
May 16, 1849.

Machinery Warehouse.
S. C. HILLS, No. 43 Fulton street, New York, has
constantly for sale Steam Engines, Boilers, Lathes,
Chucks, Drills, Planers, Force and Suction Pumps;
Tenoning, Mortising and Boring Machines, Shingle
Machines, Bolt and Nut Machines, Belting, Oil, Iron
and Lead Pipe; Rubber, Percha and Leather Hose,
&c., &c.
S. C. H.'s arrangements with several machine shops
are such that he can supply, at very short notice, large
quantities of machinery.
November 23, 1849.

**George O. Robertson,
BROKER IN SCOTCH AND
AMERICAN PIG IRON;**
Bar Iron, Lead, Spelter, Tin, Copper, etc.,
No. 4 Liberty Place, MAIDEN LANE,
(Near Broadway.)
NEW YORK

**Manufacture of Patent Wire
ROPE AND CABLES,**
For Inclined Planes, Suspension Bridges, Standing
Rigging, Mines, Cranes, Derrick, Tilters, &c., by
JOHN A. ROEBLING, Civil Engineer,
TRENTON, N. J.

**Samuel D. Willmott,
MERCHANT, AND MANUFACTURER OF
CAST STEEL WARRANTED SAWS,**
—AND FILES—
IMPORTER OF THE
GENUINE WICKESLY GRINDSTONES
NO. 8 LIBERTY STREET,
NEW YORK.

**Doremus & Harris,
ANALYTICAL & CONSULTING CHEMISTS,
179 BROADWAY, NEW YORK.
SCHOOL OF CHEMISTRY.**

IRON.

Railroad Iron.
3,000 TONS C. L. MAKE 63½ lbs. per yard,
now landing and to arrive.
Also contracts made for future delivery of above su-
perior make English Iron.
300 Tons Banks Best Iron, Round, Square and Flat.
200 " English Bar " " " "
10 " 9-16 Square Iron for Railroad Spikes.
For sale in lots to suit purchasers by
DAVID W. WETMORE.
New York, March 26, 1850. 3m

**SPRING STEEL FOR LOCOMOTIVES, TEN-
DERS AND CARS.**—The subscriber is engaged
in manufacturing spring steel from 1½ to 6 inches in
width, and of any thickness required: large quantities
are yearly furnished for railroad purposes, and wher-
ever used its quality has been approved of. The estab-
lishment being large, can execute orders with great
promptitude, at reasonable prices, and the quality war-
ranted. Address **J. F. WINSLOW, Agent,**
Albany Iron and Nail Works.

Railroad Iron.
THE Undersigned, Agents for Manufacturers, are
prepared to contract to deliver Rails of superior
quality, and of any size or pattern, to any ports of dis-
charge in the United States.
COLLINS, VOSE & CO.,
74 South St.
New York, June 1, 1850.

Railroad Iron.
1,500 Tons weighing 58 lbs. per lineal yard.
500 " " 57 " " "
500 " " 56 " " "
500 " " 60 & 61 lbs, "
Also 2½ flat rails. All the above being of approv-
ed patterns. For sale by
DAVIS, BROOKS, & CO.,
68 Broad street.
N.B.—Rails imported on commission, or at a fixed
price.

Iron.
Pig Iron, Anthracite and Charcoal; Boiler and Flue
Iron, Spring and Blistered Steel, Nail Rods, Best Re-
fined Bar Iron, Railroad Iron, Car Axles, Nails, Stove
Castings, Cast Iron Pipes of all sizes, Railway Chairs
of approved patterns for sale by
COLEMAN, KELTON & CAMBELL,
109 N. Water St., Philadelphia.

IRONDALE PIG METAL, MANUFACTURED
and for sale by the Bloomsburg Railroad Iron Co.
LINDLEY FISHER, Treasurer.
75 N. Water St., Philadelphia.

Railroad Iron.
2000 Tons, weighing 58 pounds per lineal yard,
of the most approved pattern of T rails, in
store and to arrive, for sale by
COLLINS, VOSE & CO.,
74 South St.
New York, June 1, 1850.

Railroad Iron.
1675 Tons, weighing about 61 lbs. per yard, 90
tons, weighing about 52 lbs. per yard, and
825 tons, weighing about 53½ lbs. per yard, of the lat-
est and most approved patterns of T rail, for sale by
BOORMAN, JOHNSTON & CO.,
119 Greenwich street.
New York, Feb. 25, 1850.

N.B.—B. J. & Co are also prepared to take con-
tracts for English rails, delivered in any of the Atlan-
tic ports of the United States.

Railroad Iron.
THE UNDERSIGNED, HAVING made arrange-
ments abroad, are prepared to contract for the de-
livery of Foreign rails, of approved brands upon the
most favorable terms.
They will also make contracts for American rails,
made at their Trenton works, from Andover Iron, in
whole or in part, as may be agreed upon.
They are prepared to furnish Telegraph, Spring and
Market Wire; Braziers and Wire Rods; Rivets and
Merchant Bars to order, all made exclusively from An-
dover Iron. The attention of parties who require iron
of the very best quality for special purposes, is respect-
fully invited.
COOPER & HEWITT,
17 Burling Slip, New York.
February 15, 1850.

Glendon Refined Iron.

Round Iron, Band Iron, Hoop Iron,
Square " Flat " Scroll "
Axles, Locomotive Tyres,
Manufactured at the Glendon Mills, East Boston, for
sale by **GEORGE GARDNER & CO.,**
5 Liberty Square, Boston, Mass.
Sept. 15, 1849. 3m37

**PATENT HAMMERED RAILROAD, SHIP &
BOAT SPIKES.**—The Albany Iron Works
have always on hand, of their own manufacture, a
large assortment of Railroad, Ship and Boat Spikes
from 2 to 12 inches in length, and of any form of head.
From the excellence of the material always used in
their manufacture, and their very general use for rail-
roads and other purposes in this country, the manu-
facturers have no hesitation in warranting them fully
equal to the best spikes in market, both as to quality
and appearance. All orders addressed to the subscrib-
ers at the works will be promptly executed.

JOHN F. WINSLOW, Agent,
Albany Iron and Nail Works, Troy, N. Y.
The above Spikes may be had at fact: prices, at
Erastus Corning & Co Albany, Merrill & Co., New
York; E. Pratt & Brother, Baltimore, Md.

**LAP—WELDED
WROUGHT IRON TUBES**
FOR
TUBULAR BOILERS,
FROM ONE AND A QUARTER TO SEVEN
INCHES IN DIAMETER.
THE ONLY Tubes of the same quality and man-
ufacture as those so extensively used in England,
Scotland, France and Germany, for Locomotive, Ma-
rine and other Steam Engine Boilers.
THOMAS PROSSER & SON, Patentees,
28 Platt street, New York.

Railroad Iron.
THE UNDERSIGNED ARE PREPARED TO
contract for the delivery of English Railroad Iron
of favorite brands, during the Spring. They also re-
ceive orders for the importation of Pig, Bar, Sheet, etc.
Iron.
THOMAS B. SANDS & CO.,
22 South William street,
New York.
February 3, 1849.

Iron Store.
THE Subscribers, having the selling agency of the
following named Rolling Mills, viz: Norristown,
Rough and Ready, Kensington, Triadelphia, Potts-
grove and Thorndale, can supply Railroad Companies,
Merchants and others, at the wholesale mill prices for
bars of all sizes, sheets cut to order as large as 58 in.
diameter; Railroad Iron, domestic and foreign; Loco-
motive tire welded to given size; Chairs and Spikes;
Iron for shafting, locomotive and general machinery
purposes; Cast, Shear, Blister and Spring Steel; Boil-
er rivets; Copper; Pig Iron, etc., etc.
MORRIS, JONES & CO.,
Iron Merchants,
Schuylkill 7th and Market Sts., Philadelphia.
August 16, 1849. 1y33

Railroad Iron.
THE MOUNT SAVAGE IRON WORKS, AL-
legany county, Maryland, having recently pass-
ed into the hands of new proprietors, are now prepar-
ed, with increased facilities, to execute orders for any
of the various patterns of Railroad Iron. Communi-
cations addressed to either of the subscribers will have
prompt attention. **J. F. WINSLOW, President**
Troy, N. Y.
ERASTUS CORNING, Albany
WARREN DELANO, Jr., N. Y.
JOHN M. FORBES, Boston.
ENOCH PRATT, Baltimore, Md.
November 6, 1848.

Railroad Iron.
THE SUBSCRIBERS ARE PREPARED TO
take orders for Railroad Iron to be made at their
Phoenix Iron Works, situated on the Schuylkill Riv-
er, near this city, and at their Safe Harbor Iron Works,
situated in Lancaster County, on the Susquehanna
river; which two establishments are now turning out
upwards of 1800 tons of finished rails per month.
Companies desirous of contracting will be promptly
supplied with rails of any required pattern, and of the
very best quality.
REEVES, BUCK & CO.
45 North Water St. Philadelphia,
March 15, 1849.

Monument Foundry.

A. & W. DENMEAD & SON,
Corner of North and Monument Sts.,—Baltimore,
HAVING THEIR

IRON FOUNDRY AND MACHINE SHOP

In complete operation, are prepared to execute faithfully and promptly, orders for Locomotive or Stationary Steam Engines, Woolen, Cotton, Flour, Rice, Sugar Grist, or Saw Mills, Slide, Hand or Chuck Lathes, Machinery for cutting all kinds of Gearing, Hydraulic, Tobacco and other Presses, Car and Locomotive patent Ring Wheels, warranted, Bridge and Mill Castings of every description, Gas and Water Pipes of all sizes, warranted, Railroad Wheels with best fagotted axle, furnished and fitted up for use, complete. Being provided with Heavy Lathes for Boring and Turning Screws, Cylinders, etc., we can furnish them of any pitch, length or pattern. Old Machinery Renewed or Repaired—and Estimates for Work in any part of the United States furnished at short notice.
June 8, 1849.

Iron Wire.

REFINED IRON WIRE OF ALL KINDS,
Card, Reed, Cotton-flyer, Annealed, Broom, Buckle, and Spring Wire. Also all kinds of Round, Flat or Oval Wire, best adapted to various machine purposes, annealed and tempered, straightened and cut any length, manufactured and sold by
ICHABOD WASHBURN.

Worcester, Mass., May 25, 1849.

American and Foreign Iron.

FOR SALE.
300 Tons A 1, Iron Dale Foundry Iron.
100 " 1, " " "
100 " 2, " " "
100 " " Forge " "
400 " Wilkesbarre " "
100 " " Roaring Run" Foundry Iron.
300 " Fort " "
50 " Catoctin " "
250 " Chikiswalungo " "
50 " " Columbia" "chilling" iron, a very superior article for car wheels.
75 " " Columbia" refined boiler blooms.
30 " 1 x 1/2 Slit iron.
50 " Best Penna. boiler iron.
50 " "Puddled" "
50 " Bagnall & Sons refined bar iron.
50 " Common bar iron.

Locomotive and other boiler iron furnished to order.
GOODHUE & CO.,
64 South street
New York.

American Pig, Bloom and Boiler Iron.

HENRY THOMPSON & SON,
No 57 South Gay St., Baltimore, Md.
Offer for sale. Hot Blast Charcoal Pig Iron made at the Catoctin (Maryland), and Taylor (Virginia), Furnaces; Cold Blast Charcoal Pig Iron from the Cloverdale and Catawba, Va., Furnaces, suitable for Wheels or Machinery requiring extra strength; also Boiler and Flue Iron from the mills of Edge & Hilles in Delaware, and best quality Boiler Blooms made from Cold Blast Pig Iron at the Shenandoah Works, Va. The productions of the above establishments can always be had at the lowest market prices for approved paper. American Pig Iron of other brands, and Rolled and Hammered Bar Iron furnished at lowest prices. Agents for Watson's Perth Amboy Fire Bricks, and Rich & Cos. New York Salamander Iron Chests.
Baltimore, June 14, 1849. 6 mos

Wheel, Forge and Foundry Iron.

LOCUST GROVE Wheel Iron of great strength and superior chilling property. Balt. Charcoal Forge Iron, from Patuxent, Curtis Creek and Gunpowder furnaces. Elkridge Foundry Iron, of superior strength and softness. Anthracite and Charcoal Iron from Pennsylvania and Virginia. Gas and Water Pipes, Lamp Posts from Elkridge furnace.

LEMMON & GLENN,
62 Buchanan's Wharf, Baltimore.

Iron.

THE SUBSCRIBERS having resumed the agency of the New-Jersey Iron Company, are prepared to execute orders for the different kinds and sizes of Iron usually made at the works of the company, and offer for sale on advantageous terms.—

150 tons No. 1 Boonton Foundry Pig Iron.
100 " No. 2 do. do. do.
300 " Nos. 2 & 3 Forge do. do.
100 " No. 2 Glendon do. do.
140 " Nos. 2 & 3 Lehigh Crane do do.
100 " No. 1 Pompton Charcoal do.
100 " New-Jersey Blooms
50 " New-Jersey Fagotted Iron, for shafts
Best Bars, 1/2 to 4 inch by 1/2 to 1 inch thick.
Do do Rounds and Squares, 1/2 to 3 inch.
Rounds and Squares, 3-15 to 1 inch.
Half Rounds, 1/2 to 1 in. Ovals & Half Ovals 1/2 to 1 1/2 in.
Bands, 1 1/2 to 4 inch. Hoops, 1/2 to 2 inch.
Trunk Hoops, 1/2 to 1 1/2 in. Horse Shoe & Nut Iron.
Nail Plates. Railroad Spikes.
DUDLEY B. FULLER & Co., 139 Greenwich-st. and 85 Broad-st.

WILLIAM JESSOP & SONS' CELEBRATED CAST-STEEL.

The subscribers have on hand, and are constantly receiving from their manufactory,
PARK WORKS, SHEFFIELD,
Double Refined Cast Steel—square, flat and octagon. Best warranted Cast Steel—square, flat and octagon. Best double and single Shear Steel—warranted. Machinery Steel—round.
Best and 2d gy. Sheet Steel—for saws and other purposes.
German Steel—flat and square, "W. I. & S." "Eagle" and "Goat" stamps.
Genuine "Sykes" L Blister Steel.
Best English Blister Steel, etc., etc.
All of which are offered for sale on the most favorable terms by
WM. JESSOP & SONS,
91 John street, New York.
Also by their Agents—
Curtis & Hand, 47 Commerce street, Philadelphia.
Alex'r Fullerton & Co., 119 Milk street, Boston.
Stickney & Beatty, South Charles street, Baltimore.
May 6, 1848.

JOHNSON, CAMMELL & Co's Celebrated Cast Steel,

AND
ENGINEERING AND MACHINE FILES,
which for quality and adaptation to mechanical uses, have been proved superior to any in the United States. Every description of square, octagon, flat and round cast steel, sheet, shovel and railway spring steel, best double and single shear steel, German steel, flat and square, goat stamps, etc. Saw and file steel, and steel to order for any purposes, manufactured at their Cyclops Steel Works Sheffield.

JOHNSON, CAMMELL & CO.,
100 William St., New York.
November 23 1843.

Railroad Iron.

OF ANY PATTERN AND WEIGHT,
Of a Favorite Brand,
And deliverable in Bond, or Duty paid, at any Port of the U. S., contracted for on favorable terms, by
CHARLES ILLIUS,
20 Beaver St., New York.

Pig and other Iron also contracted for. Sole Agent for "Boxer's Machine and Burning Oil"—particularly adapted for "Railroads" and other Machinery—Preferred to Sperm by the many now using it, and 25 per cent. cheaper.

CUT NAILS OF BEST QUALITY, BAR IRON
(including Flat Rails) manufactured and for sale by
FISHER, MORGAN & CO.,
75 N. Water St., Philadelphia.

Ogden & Martin's ROSENDALE CEMENT.

WE are prepared to enter into arrangements for supplying our Cement for public works or other purposes. We warrant the cement equal in every respect to any manufactured in this country. It attains a great degree of hardness, sets immediately under water, and is a superior article for masonry coming in contact with water, or requiring great strength.

For sale in tight barrels, well papered, at their office by
OGDEN & MARTIN, 104 Wall st.
February 16, 1850.

The above cement is used in most of the fortifications building by government.

To Steam Engine Builders.

THE Undersigned offer for sale, at less than half its cost, the following new machinery, calculated for an engine of 62 inches cylinder and 10 feet stroke, viz.

- 2 Wrought Iron Cranks, 60 inches from centre to centre.
- 1 Do. do. Connecting Rod Strap.
- 2 Do. do. Crank Pins.
- 1 Eccentric Strap.
- 1 Diagonal Link with Brasses.
- 1 Cast Iron Lever Beam (forked).

The above machinery was made at the West Point Foundry for the U. S. Steamer Missouri, without regard to expense, is all finished complete for putting together, and has never been used. Drawings of the cranks can be seen on application to

HENRY THOMPSON & SON,
No. 57 South Gay St., Baltimore, Md.
Sept. 12, 1849.

8,000 Tons Railroad Iron.

THE OHIO AND PENNSYLVANIA RAILROAD CO. wish to contract for eight thousand tons of Railroad Iron, for the eastern division of their road, extending westward from Pittsburgh. Three thousand tons to be delivered on the Ohio river at Pittsburgh and Beaver, before the close of canal navigation in the present year, 1850; and the remainder in the spring of next year. The rails are to be of the H pattern, in lengths of 20 feet, and are to weigh 60 lbs. per lineal yard. They are to be subject to the inspection of Solomon W. Roberts, Chief Engineer.—For further particulars address the President of the Company at Pittsburgh.

By order of the Board of Directors.
WM. ROBINSON, Jr., President.

S. S. Keyser & Co., IRON WAREHOUSE,

Corner of South and Pratt Streets,
BALTIMORE, MD.
Selling Agents for the Rough and Ready Bar Iron and Elk Boiler and Flue Iron Rolling Mills, Sarah and Taylor Furnaces, and Wrightsville Hollow Ware Foundry, and Dealers in Bar and Sheet Iron, and Cast, Sheer, German, Blister, Spring and Electroplated Steel, etc., etc.

Smith & Tyson,

GENERAL COMMISSION MERCHANTS,
No. 25 South Charles St., Baltimore, Md.
AGENTS for the Celebrated Columbia Pig Iron, suitable for Car Wheels and Chilled Rails.
Columbia refined Charcoal Blooms; Refined Charcoal Juniata Bilet Iron for Wire; Refined Iron for Bridging, of great strength; Cut Nails, Spikes, and Brads; Railroad Spikes and Wrought Chairs. 22tf

To Railroad Companies and Contractors.

FOR SALE.—Two Locomotive Engines and Tenders, at present in use on the Beaver Meadow Railroad, being too light for their coal trains, but well calculated for either gravel or light passenger trains.

They weigh, in running order, about 8 tons each—having one pair of driving wheels 4 feet diameter, 4 truck wheels 30 inches diameter, with cylinders 10 in. diameter, and 18 inches stroke of piston. Tenders on 4 wheels. Address **JAMES ROWLAND,**

Pres't. Beaver Meadow Railroad & Coal Co., Philadelphia.
or, **L. CHAMBERLAIN, Sec'y,**
at Beaver Meadow, Pa.
May 19, 1849. 20tf

Railroad Instruments.

THEODOLITES, TRANSIT COMPASSES,
and Levels, with Fraunhoffer's Munich Glasses, Surveyor's Compasses, Chains, Drawing Instruments, Barometers, etc., all of the best quality and workmanship, for sale at unusually low prices, by
E. & G. W. BLUNT,

No. 179 Water St., cor. Burling Slip.
New York, May 19, 1849.

Rosendale Cement.

THE NEWARK AND ROSENDALE LIME AND CEMENT CO. are now manufacturing at their works in NEWARK, N. J., and Ulster county, N. Y., a very superior article of Hydraulic Cement—also Lime Calcine Plaster, etc. Contractors and dealers will find it to their advantage to call or make application before purchasing elsewhere. All communications addressed to the subscriber, at Newark, N. J., will be punctually attended to.

ly*15 **HENRY WILDE, Secretary.**

Patent India Rubber Steam Packing.

THIS article, made by the subscriber, who alone is authorised to make it, is warranted to stand as high a degree of heat as any that has been or can be made by any person—and is the article which has made the reputation of India Rubber Steam Packing and the demand therefor. A large assortment of all thick nesses requisite for any description of engines, steam pipes, valves, etc., constantly on hand and for sale by the manufacturer and patentee, who will give every information regarding its properties, mode of use, etc. at the warehouse.

JOHN GREACHEN, JR.,

98 Broadway, opposite Trinity Church.
New York, October, 1849.

Passenger Car Linings.

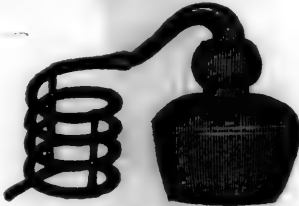
THE Advertiser continues to make to order the Enamelled Car Linings which have been so highly approved the last three years, and are now exclusively used by all the Northern Railroads. No pains are spared to get out new styles, and adapt them to the tastes of every consumer.

Orders addressed to CHARLES STODDER, No. 75 Kilby street, Boston, will have prompt attention.
March 23, 1850. 2m

CAUTION.

RAILROAD COMPANIES and others are hereby cautioned against using or vending our improvement for easing the lateral motion as applied on Railroad Cars. Letters Patent having been granted to us in 1841, any party or parties so making or using said improvement without license from us will be proceeded against according to law.

DAVENPORT & BRIDGES.



P. H. Griffin,

Corner of Steuben and James Sts. Albany, N.Y.
CONTINUES to manufacture copper flues for locomotive boilers, brewers' coppers, stills, tanner heaters, etc. Copper work in general, at the shortest notice. He has constantly on hand brass cocks, brass valves, copper pumps of every variety.
Orders promptly attended to. 1y14

FWLER M. RAY'S Patent India-rubber Railroad CAR SPRING.

New York and Erie Railroad Shops.
Piermont, March 26, 1850.

This will certify that from practical experience in the use of Fowler M. Ray's India rubber Car Springs, I believe them to be far superior to any others now in use.

I have never known them to be affected by any change of temperature, as other Rubber Springs have been affected on this road.

I am at the present time repairing a Passenger Car that Mr. Ray and myself mounted with his springs about two years and eight months since.

The springs are at the present time as perfect, to all appearances, as when first applied to the car.

Respectfully yours,

HORACE B. GARDNER,
Foreman of the Car Shops.

Supt. Office N.Y. & H. R.R., }
New York, March 8, 1850.

This is to certify that we have used the Rubber Springs manufactured by Mr. F. M. Ray for the past twenty months, "both for Passenger and Freight Car Springs and Bumpers, and of different sizes," and have in every case given entire satisfaction, and I consider them the best spring now in use.

M. SLOAT, Supt.

Harlem R.R. Depot, }
New York, March 7, 1850.

This is to certify that we have used Mr. F. M. Ray's India-rubber Springs for over eighteen months, and find them to be easy and durable, and recommend them to railroad companies as being superior to anything we have tried.

J. M. SMART,
Foreman at 42d St. Depot.

Office New Jersey Railroad Co., }
Jersey City, March 8, 1850. }

FOWLER M. RAY, Esq.,
Dear Sir: In answer to your enquiries respecting the operation of the Vulcanised Rubber Springs, purchased by our company from you some two years since, I reply that they are superior to any spring in use, (that I have either seen or heard of).

The improved form of your spring, consisting of a solid piece of vulcanised rubber with bands on the outside, is far superior to your first form, consisting of disks of rubber with metallic plates interposed.

The last named form was tried, if you recollect, at a much earlier period; and then was replaced by your last form.

I have no hesitation in saying that your springs have given entire satisfaction, and most cheerfully recommend them to railroad companies throughout the country for the following reasons:

1st. The cost is 30 per cent. less.

2d. Saving of weight on each car of 8 wheels from 700 to 800 lbs.

3d. Less care and attention is required, as they are not liable to get out of repair.

4th. A great saving is secured in the wear and tear of the cars and rails from their great elasticity.

5th. The freedom from noise.

6th. There is greater safety in case of accident, as they cannot be broken.

7th. The comfort of passengers is enhanced sufficiently to pay the expense, waiving all the other reasons that I have given.

Should this fail to satisfy any person enquiring, you are at liberty to refer to me, No. 150 Washington St., Jersey City.

Yours respectfully,

T. L. SMITH, Supt.

New York, March 11, 1850.

I have used the Patent India-rubber Spring purchased of Mr. Ray, upon the cars of the New York and New Haven Railroad, and have found them efficient and economical; and when applied to the axles and draw springs, believe them to be quite equal to any in use. I have found a combination of these springs with a steel spring under the transom beam a very satisfactory arrangement, and am now using this plan in all new cars.

Yours respectfully,

ROBERT SCHUYLER.

February 25, 1850.

From practical observation of the use of the India-rubber Car Springs, manufactured and sold by your company, we are entirely satisfied in their application, and do not hesitate to recommend them as elastic, durable, requiring no repairs for years, and retaining their consistency during all extremes of weather. We have applied them for the past two years, and consider them superior for all railroad purposes.

Yours truly,

OSGOOD BRADLEY, Car Builder, Worcester.
T. & C. WASON, do. Springfield.
DEAN, PACKARD & MILLS, do. do.
DAVENPORT & BRIDGES, do. Cambridgeport.

Office of the New Jersey Railroad Co., }
Jersey City, March 7, 1850. }

This is to certify that we have had Mr. F. M. Ray's India-rubber Springs in constant use under our cars, and as Bumper Springs for upwards of two years, and they have in every way given perfect satisfaction.

The present form of spring we deem far superior to the form of Disk, having used both forms, although we have none of those made in Disks at present in use.

We take pleasure in recommending these springs to all railroad companies.

J. P. JACKSON, Vice Prest.
New Jersey Railroad and Trans. Co.

Roxbury, February 28, 1850.

In compliance with your request, I take great pleasure in stating the result of my experience in the use of "Ray's Patented Vulcanised India-rubber Car and Engine Springs." We have used them nearly two years, and never had one fail in any way. The cold weather does not affect them, as it has other rubber springs we have used.

With sixteen years' experience as superintendent of machinery on the Boston and Providence railroad, I take pleasure in saying that your springs are the best we ever used, or I ever saw used elsewhere. We have 20 cars rigged with them, of which I can say that the springs are as good now as when first applied. I put 24 lbs. of the rubber under the fore and end of one of our heaviest engines, taking off 250 lbs. of steel springs—it has been in use 18 months, and is in as good condition now as when first put under the engine.

Very respectfully yours,

GEO. S. GRIGGS,
Supt. of Machinery, Boston and Prov. R.R.

Fall River, February 2, 1850.

In answer to yours of the 20th ult. I would say that this company has for some 10 or 12 months past been using "Ray's India-rubber Springs." We have applied them to both passenger and freight cars with uniform success. They have invariably preserved their elasticity and consistency through all the extremes of weather; and we are now applying them whenever the steel spring fails. I am well satisfied that they are particularly adapted for railroad purposes.

Very respectfully yours,

GEO. HAVEN,
Supt. Fall River Railroad.

Jersey City, March 9, 1850.

This is to certify that the present form of Mr. F. M. Ray's India-rubber Car Spring I consider far superior to the form of Disk, having used both forms.

I take pleasure in recommending these springs to all railroad companies.

DAVID H. BAKER,
Foreman of Car Shop of N.J. R.R. & Trans. Co.

Boston, March 5, 1850.

In answer to your enquiry about India-rubber Springs, I have to say that we have used them to a considerable extent on both freight and passenger cars, and also on several of our tenders; and I am very well satisfied that they answer all the purposes for which they are intended. I believe the India-rubber will soon supersede all other springs for cars and tenders.

Yours truly,

S. M. FELTON,
Supt. Fitchburg Railroad.

Old Colony Railroad Office,
Boston, March 6, 1850.

EDWARD CRANE, Esq.,
President New England Car Co.,

Dear Sir: In compliance with your request I would state that the Old Colony Railroad Company have had in use upon their road, India-rubber Springs furnished by your company, for more than eighteen months past, during which time they have been extensively used under Passenger and Freight Cars, Locomotive Tenders, and for Draw and Buffing Springs, with the most perfect success. The elasticity and consistency of the Rubber has never been unfavorably affected by either extremes of heat or cold—and from the experience which we have had in the use of Rubber Springs, I think them well adapted for railroad purposes—and therefore we have for some months past used Rubber almost exclusively, in all places where springs are required.

Respectfully yours, etc.,

JAS. H. MOORE,
Supt. O. C. Road.

Troy, February 27, 1850.

We have been using your India-rubber Car Springs for nearly two years—and we take pleasure in saying that in our opinion the rubber has to a certain extent already, and may eventually entirely supersede all other Springs for Railroad Car purposes. We now use it entirely for Draw Springs and Bumpers, considering it better and lighter than steel.

During our two years' experience in the use of it, we have not known any to lose their elasticity, or fail in any way; and we cheerfully recommend the rubber for railroad car springs.

Very respectfully,
EATON, GILBERT & CO.

To Practical Machinists.

AN excellent opportunity now occurs to a practical Machinist, of WELL ESTABLISHED REPUTATION, and some capital, to engage extensively in the STEAM ENGINE, BOILER and FOUNDRY BUSINESS.

An establishment is now ready for business, ample in all its details, including extensive wharf room, for any sized steamboats, and from its position, if properly conducted, will doubtless command a large share of business.

A practical Machinist, as a partner is required, to conduct the whole establishment; and only those FULLY COMPETENT need apply. Address (post paid) "MACHINE CO.," Box No. 741, Philadelphia, Pa. 1ml4

Etna Safety Fuse.

THIS superior article for igniting the charge in wet or dry blasting, made with DUPONT'S best powder, is kept for sale at the office and depot of

REYNOLDS & BROTHER,

Sole Manufacturers,

No. 85 Liberty St.

NEW YORK.

And in the principal cities and towns in the U. States.

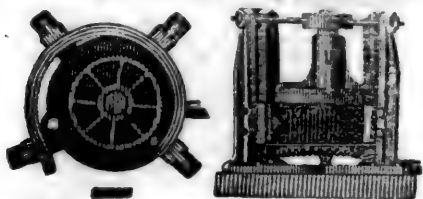
The Premium of the AMERICAN INSTITUTE was awarded to the Etna Safety Fuse at the late Fair held in this city.

November 3, 1849.

ly

MACHINERY.

Henry Burden's Patent Revolving Shingling Machine.



THE Subscriber having recently purchased the right of this machine for the United States, now offers to make transfers of the right to run said machine, or sell to those who may be desirous to purchase the right for one or more of the States.

This machine is now in successful operation in ten or twelve iron works in and about the vicinity of Pittsburgh, also at Phoenixville and Reading, Pa., Covington Iron Works, Md., Troy Rolling Mills, and Troy Iron and Nail Factory, Troy, N. Y., where it has given universal satisfaction.

Its advantages over the ordinary Forge Hammer are numerous: considerable saving in first cost; saving in power; the entire saving of shingler's, or hammerman's wages, as no attendance whatever is necessary, it being entirely self-acting; saving in time from the quantity of work done, as one machine is capable of working the iron from sixty puddling furnaces; saving of waste, as nothing but the scoria is thrown off, and that most effectually; saving of staffs, as none are used or required. The time required to furnish a bloom being only about six seconds, the scoria has no time to set, consequently is got rid of much easier than when allowed to congeal as under the hammer. The iron being discharged from the machine so hot, rolls better and is much easier on the rollers and machinery. The bars roll sounder, and are much better finished. The subscriber feels confident that persons who will examine for themselves the machinery in operation, will find it possesses more advantages than have been enumerated. For further particulars address the subscriber at Troy, N. Y. P. A. BURDEN.

Railroad Spikes and Wrought Iron Fastenings.

THE TROY IRON AND NAIL FACTORY, exclusive owner of all Henry Burden's Patented Machinery for making Spikes, have facilities for manufacturing large quantities upon short notice, and of a quality unsurpassed.

Wrought Iron Chairs, Clamps, Keys and Bolts for Railroad fastenings, also made to order. A full assortment of Ship and Boat Spikes always on hand.

All orders addressed to the Agent at the Factory will receive immediate attention.

P. A. BURDEN, Agent,
Troy Iron and Nail Factory, Troy, N. Y.

RAILROAD WHEELS.

CHILLED RAILROAD WHEELS.—THE UNDERSIGNED are now prepared to manufacture their Improved Corrugated Car Wheels, or Wheels with any form of spokes or discs, by a new process which prevents all strain on the metal, such as is produced in all other chilled wheels, by the manner of casting and cooling. By this new method of manufacture, the hubs of all kinds of wheels may be made whole—that is, without dividing them into sections—thus rendering the expense of banding unnecessary; and the wheels subjected to this process will be much stronger than those of the same size and weight, when made in the ordinary way.

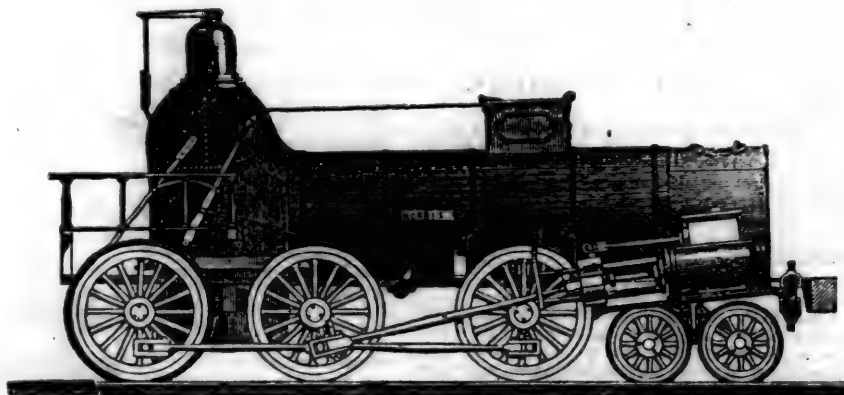
A. WHITNEY & SON,
Willow St., below 13th,
Philadelphia, Pa.

CHILLED RAILROAD WHEELS.—THE UNDERSIGNED, the Original Inventor of the Plate Wheel with solid hub, is prepared to execute all orders for the same, promptly and faithfully, and solicits a share of the patronage for those kind of wheels which are now so much preferred, and which he originally produced after a large expenditure of time and money.

A. TIERS,
Point Pleasant Foundry.

He also offers to furnish Rolling Mill Castings, and other Mill Gearing, with promptness, having, he believes, the largest stock of such patterns to be found in the country.

Kensington, Philadelphia Co.,
March 12, 1848.

NORRIS' LOCOMOTIVE WORKS.
BUSHHILL, SCHUYLKILL SIXTH-ST., PHILADELPHIA,

THE UNDERSIGNED Manufacture to order Locomotive Steam Engines of any plan or size. Their shops being enlarged, and their arrangements considerably extended to facilitate the speedy execution of work in this branch, they can offer to Railway Companies unusual advantages for prompt delivery of Machinery of superior workmanship and finish.

Connected with the Locomotive business, they are also prepared to furnish, at short notice, Chilled Wheels for Cars of superior quality.

Wrought Iron Tyres made of any required size—the exact diameter of the Wheel Centre, being given, the Tyres are made to fit on same without the necessity of turning out inside.

Iron and Brass castings, Axles, etc., fitted up complete with Trucks or otherwise.

NORRIS, BROTHERS

LAWRENCE'S ROSENDALE HYDRAULIC Cement. This Cement is warranted equal to any manufactured in this country, and has been pronounced superior to Francis' "Roman." Its value for Aqueducts, Locks, Bridges, Floors, and all Masonry exposed to dampness, is well known, as it sets immediately under water, and increases in solidity for years.

For sale in lots to suit purchasers, in tight papered barrels, by

JOHN W. LAWRENCE,
142 Front-street, New York.

Orders for the above will be received and promptly attended to at this office. 32 ly.

PATENT MACHINE MADE HORSE-SHOES.

The Troy Iron and Nail Factory have always on hand a general assortment of Horse Shoes, made from Refined American Iron.

Four sizes being made, it will be well for those ordering to remember that the size of the shoe increases as the numbers—No. 1 being the smallest.

P. A. BURDEN, Agent,
Troy Iron and Nail Factory, Troy, N. Y.

COLUMBUS, OHIO,
Railroad Car Manufactory.
RIDGWAYS & KIMBALL,

HAVE established at this central point, the manufacture of Passenger, Freight, Gravel and Hand Cars for Railroads, and assure all Western Railroad Companies that it will be their constant aim to procure the best materials and workmen, and to turn out the best kind of work at fair prices. Specimens may be seen on the Columbus and Xenia Railroad. The patronage of Railroad Companies is respectfully solicited. 178

To Inventors and Patentees.

OWEN G WARREN, ARCHITECT, Has had many years' experience as Agent for obtaining Patents, both in this country and Europe, and will transact such business promptly and reasonably. Persons at a distance can have their business done by correspondence—without the necessity of visiting this city or Washington. Office No. 94 Merchants Exchange, Wall st., corner of Hanover st., up stairs. 173

AMERICAN RAILROAD JOURNAL.

STEAM NAVIGATION, COMMERCE, MINING, MANUFACTURES.

HENRY V. POOR, Editor.

ESTABLISHED 1831.

PUBLISHED WEEKLY, AT No. 136 NASSAU ST., NEW YORK, AT FIVE DOLLARS PER ANNUM IN ADVANCE.
SECOND QUARTO SERIES, VOL. VI., No. 30! SATURDAY, JULY 27, 1850. [WHOLE No. 745, VOL. XXIII.]

ASSISTANT EDITORS,

J. T. HODGE, *For Mining and Metallurgy.*
GEN. CHAS. T. JAMES, *For Manufactures and the
Mechanic Arts.*
M. BUTT HEWSON, C. E., *For Civil Engineering.*

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American Railroad Journal.

PUBLISHED BY J. H. SCHULTZ & Co., 135 NASSAU ST.

Saturday, July 27, 1850.

We re-publish the subjoined article, as the cuts did not work well in our last impression, and as it is an article of much importance to the manufacturers of iron throughout the country.

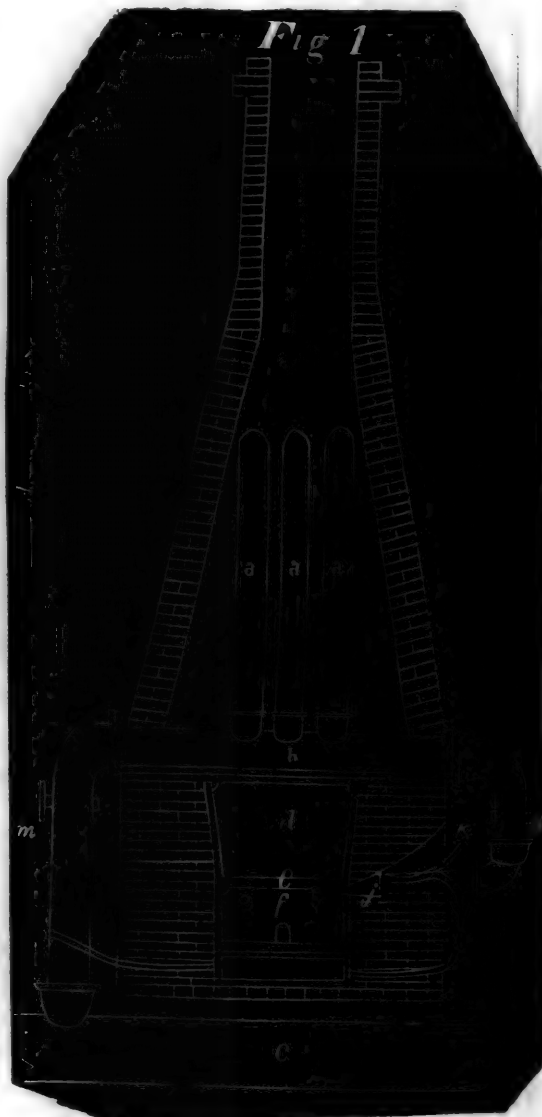
Lake Champlain Bloomery Fires.

The accompanying plans of bloomery fires, as used in the Lake Champlain region of New York, are designed to complete the article upon the forges of this district, which was left unfinished on page 290 of the Journal.

The four first figures are sections in different directions through the most simple form of the bloomery. Figures 5, 6 and 7 are sections illustrating a similar fire supplied with the arrangement for reheating the blooms with the gases of the escape heat returned to the oven and mixed with a current of heated atmospheric air.

Fig. 1 is a front elevation of the common bloomery fire: the following letters designate its several parts and the apparatus connected with it.

- a, a, a—Hot air pipes.
- b—One of the two bed pipes.
- c—Main blast pipe from the blowing cylinders.
- d—Back plate of the fire.
- e—Fire plate.
- f—Plate through which the cinder is drained off.



g—Bottom plate of the fire.
 h—Water box placed under the fire.
 i—A small pipe for letting the waste water out of the fire box.
 j—Water twere.
 k—Pipe for supplying cold water to the twere.
 l—Valve for shutting off the hot air from the fire.
 m—Throttle valve for regulating the supply of cold air to the hot blast pipes.

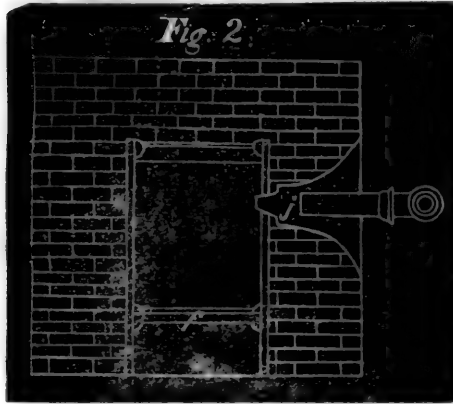


Fig. 2. Horizontal section of the same on the level of the twere.

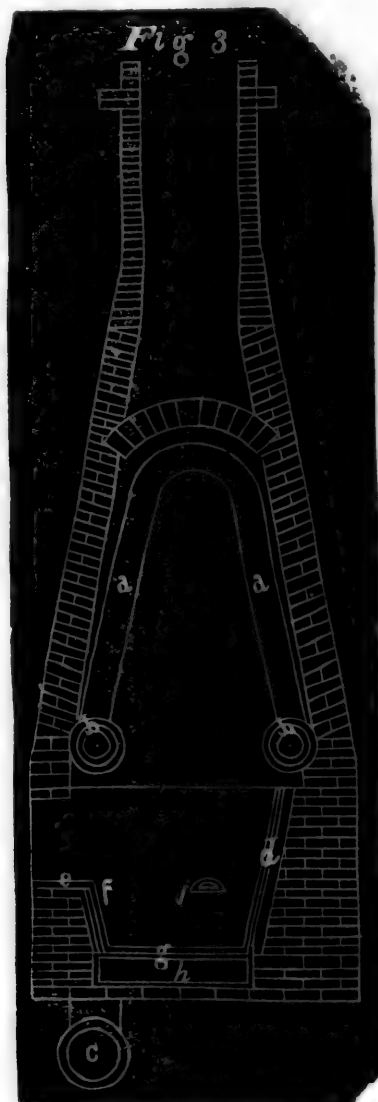


Fig. 3. Side elevation of same. The letters correspond to those in fig. 1.

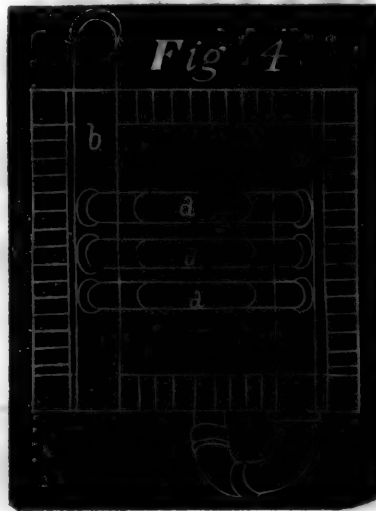


Fig. 4. Horizontal section on level of the bed-plates.



Fig. 5. Side elevation of bloomery fire with oven for re-heating the blooms.

a—Bloomery fire.
 b—Bottom of heating furnace on which the cold iron is charged.
 c—Sand hearth.
 d—Charging door.
 e—Wind box.
 f—Wrought iron blow pipe.
 g—Pipe for conveying hot air to the wind chest.
 h—Opening through which the hot air passes to feed the bloomery fire below, as seen in fig. 7.
 i, i, i, i—Hot blast pipes lying horizontally in the chimney.
 j—Cast iron door lined with fire brick; lets up and down, and can close the front of the fire, so as to keep out the cold air.

Fig. 6 is a horizontal section of the same on the level of the blow pipes and heating oven.

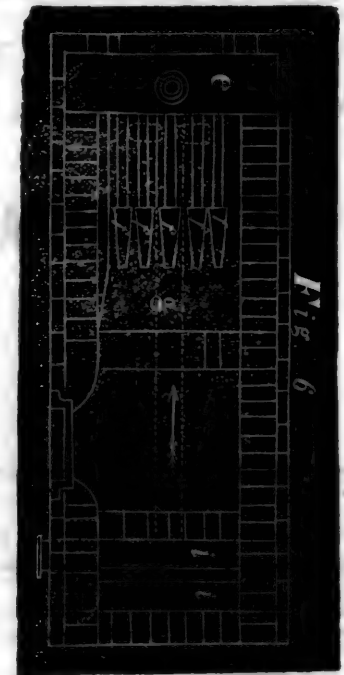


Fig. 7 is a front elevation of the same. The letters in figs. 6 and 7 correspond to those of fig. 5.



In working these bloomeries it is generally found that from good magnetic ores, well prepared by crushing and washing (unless as in some instances, already cited, the ores are rich enough and coarsely granular at the same time, to render this preparation unnecessary) a hundred pounds of iron are produced every hour, or twenty four hundred pounds every twenty four hours. Two and a quarter tons of prepared ore are used, and about 240 bushels of charcoal to the ton of iron. This shows a considerable loss of ore in the process, much more than in smelting in a well conducted blast furnace; for this prepared ore must average not far from 65 per cent. of iron. It is found most economical to use the air for the blast at a temperature estimated at about 600°; the fire being properly burdened with ore, less charcoal is consumed to the ton of blooms, than when the blast is kept at a lower temperature.

The heating oven connected with some of the bloomery fires requires more than one of these to keep it at a sufficient temperature for re-heating the blooms. The fires are so arranged that two supply the escape gases to each oven. Small blow pipes are more effectual in causing a thorough mixture of the hot air and the gases, and consequently a more complete combustion, than large ones; but the smaller the blow pipes the greater number must be employed. The pressure of the blast is estimated at from two to three pounds to the inch. H.

A DETAILED STATEMENT OF ALL THE ANTHRACITE BLAST FURNACES IN THE STATE OF PENNSYLVANIA IN 1850.

County.	Sold by Sheriff, or failed, and date.	Unfinished at blast.	Out of blast.	Date of construction.	Name of works.	Situation, P. O.	Owners.	Lessee.	Kind of ore used.	Largest product.	Actual make 1849.	No. of persons employed.	No. horses, etc. employed.	Heat.	No. towers.	Diam. do.	Pressure.	Feet bush.	Ft. height.	Kind of power used and No.	Kind of metal made and No.	Annual capacity.
Berks,	1843 S	1	1	1846	Henry Clay	Reading,	Leckhart & Bro.,	None.	H. M.	3,481	3,250	50	35,500	612	33	33	34	14	37	Steam	2	3,500
Bucks,	1844 S	1	1	1846	Durham,	Durham,	Jos. Whitaker & Co.	"	"	3,840	3,840	103	32,500	321	33	33	34	13	40	"	"	8,000
Columbia,	1844 S	1	1	1839	Montour,	Danville,	Montour I. Co.	"	F.	3,135	3,840	70	5,612	321	33	33	34	9	31	"	"	3,150
"	1844 S	1	1	1839	"	"	"	"	"	4,012	1,963	70	5	321	321	33	34	12	33	"	"	4,100
"	1842 S	1	1	1846	Franklin,	"	"	"	"	6,449	6,449	70	5	421	321	33	34	12	33	"	"	4,100
"	1842 S	1	1	1846	Roaring Creek,	"	Jacob M. Maus & Co.	"	"	1,000	900	45	45	321	321	33	34	8	30	"	"	2,000
"	1842 S	1	1	1840	Columbia,	"	Trustees U. S. Bank.	"	"	2,000	1,600	45	45	321	321	33	34	8	30	"	"	2,000
"	1842 S	1	1	1840	Iron Dale,	"	Geo. Patterson.	"	"	2,500	1,600	50	20	321	321	33	34	8	30	"	"	2,500
"	1842 S	1	1	1845	Williamsburg,	"	Bloomington I. Co.	"	"	10,200	8,132	180	80,550	321	33	33	34	14	35	Water	1	10,200
"	1842 S	1	1	1845	Light street,	"	M. McDowell,	"	"	1,200	800	40	25,500	321	33	33	34	8	30	"	"	2,000
"	1842 S	1	1	1845	Carbon,	"	J. Richards & Sons,	"	"	1,500	1,500	40	20	321	321	33	34	8	30	"	"	2,000
"	1842 S	1	1	1845	Mauch Chunk,	"	Lehigh Coal and Nav. Co.	"	"	4,052	1,534	53	8	321	321	33	34	8	30	"	"	2,000
"	1842 S	1	1	1845	Phoenix,	Phoenixville,	Reeve,	"	"	3,910	3,910	371	114,612	321	33	33	34	12	36	"	"	4,100
"	1842 S	1	1	1845	Phoenix,	"	"	"	"	4,718	2,581	71	48	321	321	33	34	12	36	"	"	5,000
"	1842 S	1	1	1845	Harrisburg,	"	D. R. Porter,	"	"	3,614	3,360	30	7	321	321	33	34	12	36	"	"	3,800
"	1842 S	1	1	1845	Emeline,	Dauphin,	A. C. Bayard,	"	"	600	3,639	30	300	321	321	33	34	12	36	"	"	2,000
"	1842 S	1	1	1845	Crane,	Catawagus,	Lehigh Crane I. Co.	"	"	3,958	4,494	500	"	321	321	33	34	12	36	"	"	4,000
"	1842 S	1	1	1845	"	"	"	"	"	4,838	6,139	"	"	321	321	33	34	12	36	"	"	5,000
"	1842 S	1	1	1845	"	"	"	"	"	7,144	"	"	"	321	321	33	34	12	36	"	"	8,000
"	1842 S	1	1	1845	"	"	"	"	"	"	"	"	"	321	321	33	34	12	36	"	"	7,200
"	1842 S	1	1	1845	"	"	"	"	"	"	"	"	"	321	321	33	34	12	36	"	"	8,000
"	1842 S	1	1	1845	"	"	"	"	"	"	"	"	"	321	321	33	34	12	36	"	"	8,000
"	1842 S	1	1	1845	"	"	"	"	"	"	"	"	"	321	321	33	34	12	36	"	"	8,000
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"	1842 S	1	1	1845	"	"	"	"	"	"	"	"	"	321	321	33	34	12	36	"	"	8,000
"	1842 S	1	1	1845	"	"	"	"	"	"	"	"	"	321	321	33	34	12	36	"	"	8,000
"	1842 S	1	1	1845	"	"	"	"	"	"	"	"	"	321	321	33	34	12	36	"	"	8,000
"	1842 S	1	1	1845	"	"	"	"	"	"	"	"	"	321	321	33	34	12	36	"	"	8,000
"	1842 S	1	1	1845	"	"	"	"	"	"	"	"	"	321	321	33	34	12	36	"	"	8,000
"	1842 S	1	1	1845	"	"	"	"	"	"	"	"	"	321	321	33	34	12	36	"	"	8,000
"	1842 S	1	1	1845	"	"	"	"	"	"	"	"	"	321	321	33	34	12	36	"	"	8,000
"	1842 S	1	1	1845	"	"	"	"	"	"	"	"	"	321	321	33	34	12	36	"	"	8,000
"	1842 S	1	1	1845	"	"	"	"	"	"	"	"	"	321	321	33	34	12	36	"	"	8,000
"	1842 S	1	1	1845	"	"	"	"	"	"	"	"	"	321	321	33	34	12	36	"	"	8,000
"	1842 S	1	1	1845	"	"	"	"	"	"	"	"	"	321	321	33	34	12	36	"	"	8,000
"	1842 S	1	1	1845	"	"	"	"	"	"	"	"	"	321	321	33	34	12	36	"	"	8,000
"	1842 S	1	1	1845	"	"	"	"	"	"	"	"	"	321	321	33	34	12	36	"	"	8,000
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Banking in the United States.

The Washington correspondent of the Evening Post furnishes that paper with a digest of a report on the condition of the banks in the Union made to Congress. The following are the leading items of that report:

COMPARATIVE VIEW OF THE CONDITION OF THE BANKS OF THE UNITED STATES.—Jan.:

	1848.	1849.	1850.
Number of banks & branches	751	782	829
Cap'l paid in.....	\$204,833,175	\$207,309,361	\$217,317,211
<i>Resources.</i>			
Loans and dis.....	344,476,582	332,333,195	364,204,078
Stocks.....	26,498,054	23,571,575	20,006,759
Real Estate.....	20,580,955	17,491,809	20,532,066
Other investments.	8,229,682	7,965,463	11,949,548
Due by other banks	38,904,525	33,258,407	41,631,855
Notes other banks	16,427,716	12,708,016	16,303,239
Specie fids.	10,409,822	8,680,483	11,003,245
Specie.....	46,369,765	43,619,308	45,379,345
<i>Liabilities.</i>			
Circulat'n.	128,506,091	114,742,415	131,306,526
Deposits..	103,226,177	91,178,623	100,536,595
Due other banks...	39,414,371	30,005,366	36,717,451
Other liabilities..	5,501,401	6,706,657	8,835,359
Total of cur. credits, i. e. circulation and deposits.	231,732,268	205,922,038	210,953,121
Total of immediate liabilities i. e. circulations, deposits & sums due other banks	271,146,639	236,017,404	277,670,572
Total of immediate m's. i. e. specie funds			
Notes of other bks & sums due by other bks	112,191,828	98,236,274	114,917,778
Excess of immediate liabilities above immediate means..	158,954,811	137,781,130	162,752,794

Specie in the Banks, Circulation and Deposits.

	Specie.	Circulation.
1834....	75,666,986	94,839,570
1835....	83,034,365	100,662,405
1836....	115,104,420	140,301,038
1837....	127,397,185	143,135,190
1838....	84,691,184	116,138,910
1839....	90,240,146	135,170,995
1840....	75,696,657	106,986,572
1841....	64,890,101	83,734,011
1842....	62,493,870	58,563,603
1843....	56,168,623	75,167,646
1844....	84,550,785	89,608,711
1845....	83,020,646	105,552,427
1846....	97,918,070	105,519,766
1847....	91,782,533	128,596,091
1848....	108,226,177	114,743,415
1849....	91,178,623	131,366,595
1850....	109,586,595	

	Deposits.	Total of current credits.
1834....	75,666,986	170,503,556
1835....	83,034,365	131,773,860
1836....	115,104,420	276,495,478
1837....	127,397,185	276,533,075
1838....	84,691,184	200,830,694
1839....	90,240,146	225,411,141
1840....	75,696,657	182,665,439
1841....	64,890,101	172,180,315
1842....	62,493,870	146,142,881
1843....	56,168,623	114,732,231
1844....	84,550,785	159,718,431
1845....	83,020,646	177,629,357
1846....	97,918,070	202,465,497
1847....	91,782,533	197,312,299
1848....	108,226,177	281,782,263
1849....	91,178,623	265,922,033
1850....	109,586,595	240,953,121

In May, 1837, the banks suspended specie payments. In May, 1838, the New York banks resumed specie payments, and the other banks attempted to follow their example, so that by January, 1839, there was what was called a general resumption of specie payments, though in many parts of the Union this was merely nominal.

In October, 1839, the banks of Philadelphia again suspended specie payments, and were imitated by the banks of the south and west.

Specie payments were not fairly resumed by the banks of Philadelphia till March, 1842. The banks of the south and west imitated their example; but in September, 1842, there was a tremendous bank convulsion at New Orleans, the effects of which were felt throughout the country. The consequence was, that by the 1st of June, 1843, the current credits of the banks were reduced to a very small amount. They continued small till May, 1843, when an expansion began, which was at first very gradual.

The great increase in the amount of specie and bank credits in 1848 over 1847, was in consequence of the demand for our breadstuffs in Europe.

In January last, the circulation of the banks was greater than it had been in any previous years, excepting 1834, 1837 and 1839; and the year 1839 may be left out of the comparison, as in the returns for that year are included many banks which did not pay specie.

In January, 1850, the banks were more expanded than they were in January, 1848.

The small amount in which the specie in the vaults of the banks varies, when compared with the amount of their circulation and deposits, is not unworthy of observation.

The greatest amount of specie in the banks was in 1844, when it was \$49,898,269. The smallest was in 1842, when it was \$28,440,423. Difference, \$21,457,846.

The circulation was lowest in 1843, when it was \$58,563,608; and highest in 1837, when it was \$149,158,190. Difference, \$90,621,582.

The deposits were lowest in 1843, when they were \$56,168,623; and highest in 1837, when they were \$127,397,185. Difference, \$71,228,562.

The current credits were greatest in 1837, when they were \$276,583,075; smallest in 1843, when they were \$114,732,231. Difference, \$161,850,844.

To the Editor of the American Railroad Journal.

In your comments on my communication published on the 22d ult., you express the opinions that cotton cloth can be made in New England cheaper than in the west, and that the west may never successfully compete with New England in the foreign cotton cloth markets. Let us discuss these points. In our hunting and fishing and Indian fighting days we had not that kind of industry that fitted us

to stand up before the power loom and spinning jenny; but as to our actual industry, that you and other people who have not been here undervalue we point to the results of our labors for the last half century; to the millions of acres reclaimed from the wilderness; to the cities, towns and roads we have made; to the commerce on our rivers, and to the muscle shown in our newly made work shops. Is there not as much industry in following the trail of an Indian or a deer as in hammering leather, or shoving the jack plane? In cutting down the giant poplars and sycamores as in sawing veneers? In "cordalling" a keel boat as in catching mackerell? There has never been a greater mistake made by strangers than that the people of the west have had and still have less industry than the people of New England or any other people. We work harder while we do work. Daniel Boone labored harder than Samuel Slater.

But our hunting days are over. We now labor from sun up to sun down in the fields and the work shops. The farmer of this valley uses his legs and arms as diligently and efficiently as he of Middlesex or Dutchess. The men and boys in the four-acre workshop of Miles Greenwood in Cincinnati, make as many hinges, screws, buckles and locks as are made by the same number of fingers in Newburg or Birmingham. A few years ago we imported all our wood screws from England and then from New England; now, Greenwood is underbidding New England in your market in this article. A few years ago we scarcely printed an almanac in this valley: now Winthrop Smith of Cincinnati, and Morton and Griswold of Louisville, print books as well and as cheap as the Harpers; they use the same machinery and get labor as cheap and as efficient. A few years ago we bought all our ready made clothing in the eastern cities; now we buy the cloth only. If our shirt maker gets but 20 cents a day, she can buy with this money and every other day, the head of a hog and a basket full of vegetables, and have enough left to pay for clothing and rent, and still have something to spare.

You are mistaken in this matter of labor. We have plenty of it. Remember that our women do not work in the fields, and have but few appropriate opportunities of earning money, and that they love new ribbands and gowns just as well as any other women in christendom. As soon as the large cotton and woolen mills are put up here, and the right systems adopted, there will be plenty of fingers for the spindles and shuttles.

We admit that we have not now as much "mechanical skill" as there is at Manchester or Lowell; but as to "ingenuity," in which you consider us inferior, we claim a full share of it. Ask your neighbor, the "Spirit of the Times," to describe to you the way in which a backwoodsman will repair a rifle with home made tools. Put the young hunter into the machine shop, and he brings to bear on his work a variety of contrivances that would astonish you.

But, even granting the greater ingenuity, industry and skill of the people of New England, is it to be supposed that they will not come out to positions where subsistence, power and raw materials are and forever must be cheaper than they can be found there? The love of independence, which is not far removed from a love of money, is "mighty" strong in the mind of a Yankee. It weighs down local attachments. My father sent four of his children to this valley because he thought they could do better here than at home. He would then have come

himself, and brought his "household goods" with him, had there been a continuous line of railroad to this valley, as there will be in a few years; and could he then have found, as he now could find, a good school, a comfortable residence and a congregational meeting house, at the spot he selected for us. You may rely upon it that the *bona fide*, working manufacturers of New England will bring their tools to the best market. Man makes his house as the bird builds her nest, as near as practicable to the best feeding place.

Well, grant that we shall have the labor, skill and tools. The Ohio coals will make as much steam as the coals from Picton or Pottsville; there are just as many hours in the day in Ohio as in Massachusetts; the great and little wheels of the mill will revolve as rapidly and as smoothly at Pomeroy as in Providence; and our wheel tenders are as near the cotton cloth markets of the world as are they of New England, and nearer to the raw cotton markets by a full cent per pound; or a smart profit. The Alleghany Mountains did present a serious barrier to the current of skill and capital that was setting in this direction. That barrier has been pierced; the current is widening its channel, and there must be an equilibrium. Labor, skill and capital will find a common level as quick as any liquid.

SCIOTA VALLEY.

An Essay on Pen and Pocket Cutlery,

Embracing a Detailed Description of the Mechanical, Chemical, and Manual Operations Performed on Certain Raw Materials, to Convert them into the Means, Implements, and Materials, for Manufacturing Pen and Pocket Knives.

BY A. L. HOLLEY.

CHAPTER VII.—DESCRIPTION OF THE OPERATIONS PERFORMED BY THE ENGLISH CUTLER ON A FOUR BLADE, SHELL HANDLED, CONGRESS KNIFE.

Continued from page 452.

A point is placed through the middle or spring hole of the mark side scales, through a spring, middle scale, another spring, and the opposite or pile side scale. A point is placed through the right hand bolster of the mark side scale, a forward point pen blade, the middle scale, a forward point pocket blade, and the opposite scale. Another point is now put through the pile side bolster, a square point pen and a nail blade. The spring ends rest on the shoulder of the tang at one end of the knife, and are lifted to that position by a pointed instrument inserted at the other. The blades are opened one by one, and the shoulder of the tang filed down if necessary, till the blade stands sufficiently back, and if already "too back," either the spring or the shoulder of the tang are lengthened by hammering. The blade may stand rightly, and thus throw the spring end above or below its back, or the blade back may be a trifle below the spring, in which case a small portion of the tang or back must be removed by a file. The blade being perfectly fitted at this point, is half shut, made to stand rightly, and to hold the spring exactly even with the scale, then shut into the handle in such a way as to cover the point to leave the nail mark out so as to be reached by the nail, to shut on the proper side of the opposite blade, and not on the back of the knife, and to hold the spring even at all points with the scale edges. For unusually thick blades, thick springs are selected, and the parts must come closely together.

These operations are performed on all the blades, which are often removed and again put into the handle a dozen times or more. The set of all the

blades and springs depends on the shape and the proportions of 48 different points on their ends, sides and corners, and if these are the twentieth part of an inch too broad or too narrow, the knife is imperfect. When the blades are thoroughly fitted to the other portions of the knife, they are with them screwed into the Vice, and the backs are filed down till even in all parts to the scales, and then "coarse glazed." As they are taken apart, each spring, scale and blade is numbered by an impression from a small chisel, so that when they again come together they may not be in a state of "pi." The springs are then "fine glazed" on the backs, ends and insides, till very smooth, and till all scratches and coarse glazer marks are erased, and the blades coarse and fine glazed on the ends of the tangs, and usually smooth filed, with a very fine toothed file on the other edges, because they cannot conveniently be laid on the wheel. The friction of the emery and steel causes great heat, and if a small piece of the latter be held on the former for a few seconds it will be heated red hot. Cutlers therefore, for and in consideration of the welfare of their fingers as well as the virtue of the steel, hold the blade on the emery only a short time at once. If, as is often the case, the temper is drawn on the point or edge of the blade, and it is made blue, this color being only superficial, is removed by the same means that caused it, and the blade is supposed to be all right.

After the out and the insides of the springs and the tang ends are made smooth, they are burnished, which consists of cleansing them from all oil and loose particles of emery and steel, and rubbing them with another smooth and first wet then dry convex steel edge, the friction of which causes a most beautiful polish. The blades are then given to the grinder, who polishes the sides of the tangs which cannot conveniently be laid on wheels while in the handle. This he does by first holding them on the circumference of a glazer covered with cake emery—similar to those above described, except of greater diameter, and less breadth—which is hung and moved in the same manner as the grindstones, and which revolves from 600 to 800 times per minute. These wheels move very true and evenly, and render any metallic surface placed upon them smooth, though not bright. The work is held down with a patch of leather. After the tangs are all thus served, they are held on a "lap" which is a wood wheel from 9 to 15 inches in diameter, with a rim of lead around its circumference, an inch or less thick, and about an inch wide, and revolving from 700 to 1000 times per minute. The wheel is covered with cake emery, which applied by lead renders the steel of the blade still more even and smooth, though it occasions no polish nor brightness. The black polish, which converts the blade into a mirror, is produced by a wheel similar to a glazer covered with dry leather, free from oil, and pulverized impure oxide of iron, called colcothar crocus, and by the French rough d'Angleterre. Colcothar is a red oxide of iron, being the residue of the distillation of sulphate of iron, which is green vitrol. This wheel revolves about 180 times per minute, and at this speed sometimes heats the blades so much as to injure them. The steel must be held and rubbed for some time on the polisher in order to be brightened, and only particular kinds of crocus will produce the desired effect. The tangs after brushing are now completely dressed, also the springs.

The shields are next put into the mark side scales of each knife by the following operations:—

an orifice in a steel plate exactly resembling the shape and size of the shield, is laid over that portion of the shell which is to be cut away. The scale and shield plate are laid against a support, and placed in the vice. A spring drill, (or fiddle bow drill, consisting of a roller and two long spring tempered arms, at the ends of which are two short, hardened points commencing at a shoulder,) is placed in the orifice in a shield plate, and made to revolve as before described. The points of the drill have a tendency to spring apart, and therefore follow the outsides of the mortice in pattern, and cut away sufficient shell to admit a shield. After all are drilled and supplied with shields, the latter, also the scale, are bored through in two places by a small hand drill, and rivetted as the shields are rivetted to the brass scale. The outsides of the bolster holes and the middle holes are countersunk, or beveled to receive the rivet head. Each pair of scales and middle scales are then put up in points, their front edges, still rough, are coarse glazed, and all the edges fine glazed, and polished by charcoal and boulder, which are rubbed on the glazer.—Boulder, or any hard stone, smooths over the charcoal, and causes it to polish the brass. The scales are afterwards separated, and their insides both coarse and fine glazed, and polished with charcoal or burnished. Sometimes the edges are milled by a wheel, the circumference of which is furnished with small and regular notches, and which leaves similar impressions on the brass. The tangs, springs, and the insides of the scales, are now wiped with buckskin, or the prepared skin of the chamois, and laid on a knife board in order, with their numbers up and in sight, then put together with German silver wire, in the same manner as before described. All such blades as do not now perfectly fit are filed and hammered till right. Two bits of wood of the thickness of the spring are placed between the scales, that they may stand straight when rivetted. The middle wire is first rivetted, then a slip of very thin metal placed between the two blades, that they may not be driven together so tightly as not to be shut or opened by the spring, when the bolster wires are rivetted, the slip removed, and the tang edges oiled. The blades are then opened and shut repeatedly, and if right, left open, and laid aside, but if they strike, one on another, the tangs are bent by a hammer till they are right. Blades must, in the language of the cutler, "walk and talk," that is, they must be sufficiently affected by the spring to keep firmly open and shut, and the different parts of the tang must strike on the spring so loud as to be distinctly heard, else the knife is imperfect. The knives are now "hafted," by fastening them in wooden clamps, which are placed in the vice, and with three fine files—two of which are cut but one way, and called floats—the edges of the shell are removed, and the whole is made even with the bolsters. The shell is next scraped with a shaving knife, and the bolsters are rough and fine glazed. The covering and bolsters are now made smooth, by being held on a "rough buff," or a wheel resembling and revolving like a glazer covered with a very oily thick leather [usually sea horse hide, which is often an inch thick, or the skin of a bull's neck] and oil, fine sand, or emery. By this wheel all marks of the files and scraping knife are erased, but no brightness or polish is produced. The knives after "rough buffed," are thoroughly cleansed from all emery, and hard, loose particles of sand, etc., and held on a "gloss buff," which resembles the other in make, but is covered with oil and rotten stone, and which pro-

duces a most brilliant polish on the shell, shield and bolsters. Rotten stone is found in Bakewell, in Derbyshire, Wales, and in Albany, N. Y., and is an earthy mineral consisting of about 86 parts alumina, 10 carbon, and 4 silica. It very nearly resembles *tripoli*, which is a compound of silica, alumina, and oxide of iron. The cutler lastly takes the knives on the board, to his bench, cleans out their insides and joints, with first a brush and fine lime, wipes them throughout with pulverized chalk and shammy skin, called wash leather, which completes—supposing him to finish two dozen knives in one job—at least 9,000 different operations. A cutler usually furnishes about two dozen knives of this variety in a week, though more can be made.

After the cutler has finished his work on the knives, they are taken to the finishing room, and inspected, the tangs and springs oiled to prevent oxidation, then wrapped in papers, with a blade open at each end, so that the handle may not be scratched or injured while the grinders again operate upon them. To "pass muster" at this first inspection, the blades must "walk" easily and "talk" audibly, though not on the back, and on each other, and must stand at a proper angle with the handle at all points, and keep the springs exactly even with the back scale edges when shut, half shut, and open. They must not rattle in the handle, nor open too hard, or too easily. The bolsters must show no scratches, nor file marks, and the blade rivet heads must not be visible. The covering must be closely fitted to the scales and bolsters, and must show no splits, file marks nor scratches, and the knife must be put so tightly together, that no light can shine through between the scales and springs.

To be continued.

For the American Railroad Journal.

Documents Relating to the Manufacture of Iron in Pennsylvania.

Published on behalf of the Convention of Iron Masters, which met in Philadelphia on the 20th of December, 1849.

Every one knows the difficulties which have heretofore embarrassed investigations into the condition of the iron manufacture in the United States, its history, and its relations to other branches of industry and to our revenue system. The great question of policy which has served at different periods to divide the public mind upon the subject of imposts, and which from its connection with several of the most important of our industrial products, has been the occasion of peculiar excitement in the hall of federal legislation, naturally drew to the support of the manufacturers of iron, all those persons whose interests and views of public economy favored the establishment of protective rates of duty. In the struggle for influence, general theories embracing all departments of manufacture were applied indiscriminately to each, and the reaction of opposing minds, as usual in such cases, urged into more vigorous antagonism all who participated in the controversy. Meantime, the statistics, which must be the basis of any sound opinions, and the analysis of which only could indicate the pure results of experience, were left the chances of private collection, and to the disturbing elements of partisanship. It will be remembered in illustration of the extreme consequences to which such a state of inquiry led, that while upon one side there was claimed an absolute protection, graduated by the actual necessities of the individuals engaged in the making of iron, and independent of the qualifications due to other interests, and to the history of foreign products; upon the other side, the econom-

ical doctrine of the subdivision of labor was fallaciously applied by direct inference to the family of nations; it was thought sufficient to cite the repeal of British protective enactments to prove the safety of a non-protective tariff for the United States; and the opening of British ports to our corn was thought an abundant compensation for the destruction of the home demand created by our furnaces, forges and mills.

During the prevalence of this blindness to the conditions of the subject, it is not remarkable that there should have been a disregard of the probabilities of legislation. Circumstances had thrown into the hands of that political party which is most frequently successful at the polls, the task of opposing the establishment of a system of protection; and as the occasional success of their antagonists was used for the enactment of impost laws favorable to the demands of the manufacturing classes, it is easy to understand that a vacillating policy was the effect at the seat of government. Improvident in relation to the perils attendant upon so unstable a support, or perhaps only too hopeful of such success as would impart to the public mind a timely confidence in their plan of encouragement to domestic interests, manufacturers freely embarked their capital and skill, until admonished of their error by a change of laws. Then a fresh effort, another change, another season of promise, and another check, furnished another lesson upon the hazards to which the too sanguine friends of home production were exposing themselves.

The unfortunate issue of these attempts, has forced upon the classes primarily concerned in them, a review of their grounds of enterprise, and a more careful and dispassionate consideration of their prosperity; in order to develop that just relationship of interests upon which all of their previous designs have depended; and to exhibit it to the legislature and to the community at large freed from the interfering objections which have hindered its appreciation by either.

Amongst the evidences of a return towards that medium line which, in public as well as private affairs, most frequently is the line of prudence, is the publication mentioned at the head of this paper. In the early part of December last a circular was issued by some well known manufacturers and dealers of iron, inviting the co-operation of parties interested in the business, at a meeting to be held at Philadelphia on the 20th of the same month. At the assembly thus convened, which was numerously attended, several committees were appointed, a part of the first of whose labors appears in the "documents." A memorial to Congress was prepared, and such facts were collected and arranged in tabular and argumentative form, as were thought best fitted to impress upon the government, and upon Americans generally, the reasoning and prayer of the memorial. It is no part of the present design to discuss the value of these contributions in the adjustment of the long-vexed question of protection. Our purpose is only to ask attention to some general considerations suggested by the convention; and to present a few of the facts collected in the tables. Putting out of view the controversial aspects of the case, there remains enough deeply to interest any one who seeks to be instructed in the rise and progress of domestic manufacture, and in the phases of opinion in relation to it. A paragraph of the memorial affords so clear an indication of the general tenor of the whole collection, that it will make the best introduction to it in this place:

"On a subject of such importance, involving so many interests, in a country so extended as ours, it is to be expected that honest differences of opinion will exist, and sectional, if not clashing claims will arise. The manufacturers of this country, whatever may be their troubles, must yield with all their fellow citizens, to that system of compromise on which all our institutions are adjusted. We cannot ask any legislation for our advantage unless it be, if not equally for the benefit, at least not injurious to the rest of the community. On this ground we are willing to base our present application for relief. We come, without distinction of party, and ask to be heard upon strictly national considerations, that if any enactment is consequent upon our petition, it may be regarded as permanent and not partial legislation. We ask not for relief to-day which may be withdrawn to-morrow; but for a settled policy. We ask to have the wisdom of all interests and all parties applied to the preparation of such a system as will be permitted to stand, subject only to the improvements which experience and time may indicate."*

A compromise of interests, and stable legislation, are the leading objects thus defined by the memorialists. In the adjustment which they regard as not only fair towards themselves but advantageous to other classes of citizens, they reject, as might have been anticipated, any impost *ad valorem*, which they describe as tending to aggravate the fluctuations of prices—to encourage frauds upon the revenue—to throw the importing business into dishonest hands—to confer a bonus on the consumption of inferior articles, and thus to degrade the national taste.† Adopting the principle of a specific tax, they nevertheless guard its application by the suggestion that "a system of revenue which would meet the low prices by a proportional increase of duty, and make provision for high rates by a like reduction, never excluding the foreign iron, would meet the exigencies of domestic industry, and greatly increase the revenue."‡

To determine the rates for this sliding scale the memorialists content themselves with a very moderate standard; one which, however it may affect at any selected point of time the interests of consumers, cannot, upon the whole, materially change the amount of their expenditure. Adverting to the facilities enjoyed by British manufacturers for the control of the market, and to our experience of their ability and readiness to accumulate stock, or to throw it, at critical periods, amongst our own consumers; and also to the enormous fluctuations of British prices, and the consequent inducements to use all their resources of competition and self-preservation against us, while our manufacturers are unable either to foresee or to compensate the vicissitudes to which they are exposed, the memorialists say:

"The legislation asked by American manufacturers deserves not the odium so frequently heaped upon it. We know that we can furnish to the consumers of this country a million of tons of iron cheaper and better than it can be had abroad. We

* Page 1.

† Page 90.—At page 101 is a table showing that in 1847 the specific form of duty was the ruling one in England in relation to foreign and colonial subjects. Of more than twenty millions of pounds net revenue from the customs, only about sixty-four thousand pounds were levied *ad valorem*.—Leaving out silks, the *ad valorem* duties amounted to less than £8,000! One-fifth of the total revenue is laid upon a single article from this country.

‡ Page 15.

ask for defence against those commercial fluctuations which occur in Great Britain from causes wholly originating there, and which, while they thrust down the prices of iron there far below the cost of making, throw large and irregular quantities into our ports, disturbing the regular course of industry here, breaking down our markets, and carrying ruin, at each such invasion, into many establishments."*

It is worthy of notice that this declaration and appeal are made in full view of the high price of labor in this country, in relation to which the tone of the "document" is healthy and such as becomes republicans.

"It is certain that in most countries where less rates are paid, a large mass of the population is in a state of destitution, and sunk to the lowest grade of human existence. In this country, where physical well-being is so easily attainable, should we not feed, clothe, and lodge our laborers in comfort and keep them out of the poor house? The wages now paid are only sufficient for this, and to enable the prudent to make some savings for sickness, reverses and old age. We are not, therefore, in favor of any system which contemplates a reduction of wages, and a consequent degradation of our working men."†

Yet the difference between the price of American and that of British labor must be compensated in some way before our products can be placed in advantageous competition with foreign articles.—Looking through the documents for an explanation of the views of the convention upon the limits of this compensation, we find one in the letter of Messrs. Cooper & Hewitt, which, being published without commentary, and agreeing with the general suggestions already quoted, we presume may be regarded as having the approbation of their associates.

"There is but one remedy left, to impose such a duty on foreign iron, as shall counterbalance the difference in the price of labor, first deducting from that difference any advantage which the American maker may have in the expense of getting his iron into market."‡

The remainder is stated to be just the quantity required to regulate the inequalities occasioned by the fluctuations of the foreign market. Hence, the memorialists say "sustain the domestic manufacture at the point of full production, and then admit the foreign article freely."§ Messrs. Cooper & Hewitt say that the duty proposed by them "would not prohibit foreign iron. It would not give the monopoly of the market to the American manufacturer, but it would establish a fair competition, and

* Page 6.—"It is frankly admitted that the consumer has a direct interest in keeping the market open for foreign iron, as a check upon the price of the domestic article. But no reasonable man will urge that to do this a system should be adopted which aggravates the fluctuating, or that because we import foreign goods, we ought to import at the same time, all the difficulties which have affected the price of those goods, such as Providential dispensations of famine and pestilence, on an uncontrollable spirit of speculation, as developed in the English railroad mania, or the evils of revolution resulting from the unjust political systems of Europe. In fact, the whole country is deeply interested, producers and consumers alike, in preventing their land from becoming a "sink," into which shall be emptied all the visals of wrath that are opened in the European world."—*Letter of Messrs. Cooper & Hewitt*, p. 65.

† Pages 9, 60.

‡ Page 61.

§ Page 16.

in the struggle that would ensue, the consumer would be sure to reap the harvest, in the gradual improvement of the quality and cheapening of the cost, in the average of years of this great staple article."*

The memorialists assume then, that if some support be not given to American manufacturers, they must abandon their works, except where their location in the interior gives a protection in the cost of transportation of British iron from the sea-board; that this abandonment must remove an important check upon British prices, and thus open the door to an increase of cost incident to a monopoly; and that, as a consequence, the loss to American consumers must be greater than any occasioned by the duty asked of our government; that it would therefore be fallacious to take as a standard for estimating the unfavorable effect of a tariff, the prices heretofore affixed to British iron, inasmuch as upon the failure of our iron works the foreign cost would rise to a greater degree than the rate of any probable impost would carry it.

The letter of Messrs. Cooper & Hewitt furnishes an estimate of duty, which we take, for the reason above given, to be satisfactory to other manufacturers. Assuming, very properly, that "the true cost of iron to the consumer, is not the price of today, or of last year, but its average price for a series of years," they state that the average price of bar iron in Liverpool from 1820 to 1849, and for each period of ten years during that time has been just £8. Taking forty per cent. as the revenue standard for iron of Mr. Secretary Walker,† they say:—

"We do not hesitate to declare that an ad valorem duty of 40 per cent., the revenue standard on £8, the average cost, will compensate for the difference in the price of labor, and be entirely adequate to build up such a domestic production of iron, as, without excluding the foreign article from our markets, to keep a check upon its price, and insure on the average of years, the lowest possible price to the consumer."‡ It results then that no demand is presented for any impost beyond the revenue standard above stated, that in adjusting the value, no increase is asked upon the actual average price of iron in Liverpool for nearly 30 years past; and that in fact the substance of the recommendation is that, by a sliding measure, the inequalities of the revenue shall be corrected, and the duty, which has heretofore been variant, shall without enlargement of its average, be rendered steady from year to year. *The mode of collecting the duty*, therefore, rather than its amount, is the subject proposed for the action of the legislature; and the establishment of a merely equalising tariff is now conceded to be sufficient not only to counterpoise the difference between foreign and domestic labor, but to neutralise the influence of those fluctuations in the foreign market which have been so disastrous to our own producers.§ We are justified therefore in

* Page 61.

† The reader will of course not confound this, which is Mr. Walker's standard of greatest productiveness, with the present rate of duty (30 per cent.) From the tenor of the letter cited in the text it may be inferred that even the latter rate, if adjusted by a sliding scale upon the basis of prices averaged for the year 1846, when the existing tariff was passed, would be acceptable to American makers.

‡ Page 62.

§ There are published with the documents two very interesting diagrams, furnished by the com-

mittee on statistics, showing the variations in the price of bar iron in Liverpool and of pig at Glasgow since the year 1822.

To be Continued.

Massachusetts.

The Eastern Railroad.—The annual meeting of this corporation, for the choice of directors, etc., was held Monday forenoon in Cochituate Hall, Boston. The President, David R. Neal, in the chair.

The report of the directors was read by the President. The following are the important items:

Capital stock has been increased 1919 shares.....	191,900 00
Floating debt.....	78,477 99
Total increase of stock and debt.....	270,377 99
No change in the funded debt.	
Construction accounts have increased.....	7,595 31
Property accounts have increased.....	262,782 68
Total investment.....	270,377 99
Railway 30th June, 1849.....	3,120,391 67
Property " ".....	444,644 67
Balance " ".....	91,224 72
	3,648,665 15
Railway 30th June, 1850.....	3,120,391 67
Property " ".....	698,608 99
Balance " ".....	100,042 48
	3,919,043 14
Increase as above....	270,377 99
Income from the business of the road, gross.....	497,461 30
Expense of maintaining and operating.....	182,848 60
Income from property.....	37,953 14
Expenses on "do.....	823 84
Net.....	37,129 30
Total net income.....	351,742 00
Balance interest account.....	35,314 45
Balance.....	316,427 55
Two dividends of \$4 per share in January and July, 1850.....	267,400 00
Surplus earnings.....	49,027 55
The gross income has increased from \$190,006 92 in 1848-9, to \$535,414 44 in 1849-50.	
The expenses and interest have increased from \$218,344 14 in 1848-9, to \$218,986 89 in 1849-50.	
The net income has increased from \$271,662 78 in 1848-9, to \$316,427 55 in 1849-50.	

The renewal fund has been charged with the whole cost of the new track, laid the past year, and with a sum sufficient to complete it to Portsmouth, and has been balanced by a transfer from the existing surplus funds. The contingent fund has also been charged with the losses and damages paid or estimated to be payable for any accidents that have heretofore occurred, and has in like manner been balanced by the withdrawal of the necessary amount from the surplus earnings, and by \$10,000 of the profits derived from the Portland, Saco and Portsmouth railroad. The whole amount necessary to complete the renewal of the track, and to meet any claims that are pending, having thus been provided for, all future appropriations to these funds will be reserved for future deterioration and contingencies.

AMERICAN RAILROAD JOURNAL.

Saturday, July 27, 1850.

Railroad Negotiations and Progress.

The principal transaction which has come to our knowledge since our last has been the negotiation of the Evansville city bonds to the amount of \$100,000 and the purchase of iron for twenty-six miles of road. Various other parties are in the market, but the above is the only transaction reported.

The building of railroads is never to cease until a "better way" shall be provided. Even the Massachusetts people, who have done the most, suffered most from unwise investment, and feel the sorest upon the subject of railroads, are constantly starting new schemes, though most of them are designed to promote the advantage and increase the business of existing lines. A project which is now attracting considerable attention in that State, is a new trunk line to the Hudson. The following roads are to constitute the proposed line: the Boston and Maine to Lawrence, the Manchester and Lawrence, the New Hampshire Central, 10 miles of which is opened, and which is to be extended to Claremont. From that point, a short link of 15 or 20 miles will open a communication to the Rutland railroad, which is followed to Rutland, thence to various points on the Hudson, by different railroads in progress from that place. The friends of this project claim it to be decidedly superior to the Western, but as it is not opened, this is of course "begging the question." The project, however, looks well "on paper," and we have no doubt but it will be pretty speedily opened. It will prove an attractive route, and draw much business when opened.

The Railroad Convention to be held in Portland, Maine, on the 31st inst., to secure the construction of a line of railway from Waterville, the most easterly point of the Maine railroad extension, to the eastern part of Nova Scotia, is attracting great attention. The Provinces are thoroughly aroused to the importance of this work, and will, we are satisfied, give to it all their energies. The convention is to be represented on their part by their very first men. This scheme is the one exactly suited to their wants, and will be so regarded by them, and as the people believe that a railroad is the only means that can restore to them former prosperity, and as a failure of the proposed line would be regarded as virtually "giving up the ship," we feel satisfied that they will provide the means by Provincial guaranty, if in no other way, for their part of the line. The portion in Maine will, we presume, be surveyed at the expense of the State. The question of "means" will not be agitated till these preliminaries are disposed of.

The Atlantic and St. Lawrence is progressing rapidly. The road is to be opened this fall to Bethel, a distance of about 70 miles from Portland, and the grading is going on upon other parts.

The Kennebec and Portland, which now conveys its passengers from North Yarmouth to Portland, over the Atlantic and St. Lawrence, is to have their line completed to that city in a few weeks. The depot of this company is to be on the north side of the town. The above companies will then have parallel lines for 12 miles, on account of difference of gauges—that of the At. and St. Law. being 5½ feet, and the K. and P. 4 feet 8½ inches. The extension of the latter road from Brunswick to Augusta, probably depends upon the subscription of leading Kennebec towns through which it is to

run. The Legislature will probably authorize the towns to subscribe, but it is feared that a two-third vote will be required to make the subscription.—This cannot be obtained in many of them. We think, however, only a majority will be required. The Legislature of Maine has authorized the city of Portland to issue its bonds to the amount of \$500,000 in favor of the Atlantic and St. Lawrence railroad, in addition to \$1,000,000 already issued, making a railroad debt of \$1,500,000 for a city of not over 20,000 inhabitants. The road, however, is doing a fine business, and promises to be able to pay the interest on these bonds, which readily sell at par.

Some of the New Hampshire railroads have taken a new start, the Legislature having authorized them to "issue bonds," the previous law not allowing this privilege, nor the issue of new stock below par. This will secure the construction of the Boston, Concord and Montreal to Well's river, and the Portsmouth and Concord. The movement above alluded to, to open a new route to Boston will, we presume, give a new impulse the Central, which is to form a part of this line. The Cocheco, which proposes to connect with the Boston, Concord and Montreal, will, we presume, make another attempt to extend its line.

DISTURNELL'S RAILROAD, STEAMBOAT AND TELEGRAPH GUIDE, is a work with which our readers are no doubt familiar. The number for July is accompanied by a large and elegant map of all the railroad and telegraph lines in the United States, which is worth more than the whole price of the work. Mr. Disturnell has long been engaged in compiling works of a similar kind, and his extensive knowledge of every part of the country, united with his accuracy and untiring industry, is sufficient guaranty for the correctness of the present volume.

List of Railroads in the U. States in 1850.

We give in this number what we believe to be a complete statement of the number of miles of railroad for passenger transportation in the United States. In New England and New York we have given the exact number of miles in each State, as we had means of ascertaining the distance traversed by the several roads in each. In some of the other States we have not gone into this exact division, and lines that are put down in one State and in some cases extend into others.

There is a large extent of coal road in Pennsylvania which is not embraced in the table.

On most of the roads the fare and rates per mile are given.

	Miles.	Fare.	Rates per m.
MAINE.			
Androscoggin and Kennebec.....	55	1 50	2-73
Atlantic and St. Lawrence*.....	47	1 40	2-97
Buckfield branch.....	12	35	2-91
Bangor and Piscataquis.....	12	38	3-16
Kennebec and Portland*.....	25	75	3-00
Bath branch.....	9	25	2-77
Portland, Saco and Portsmouth... 51	1 42	2-78	
Calais and Baring.....	3		
Machiasport.....	8		
Boston and Maine.....	3		
	225		
NEW HAMPSHIRE.			
Boston, Concord and Montreal*.. 51	1 65	3-03	
Cocheco* (Dover to Farmington).. 18	50	2-77	
Concord.....	35	80	2-28
Concord and Claremont*.....	25	90	3-60
Contoocook Valley*.....	14	45	3-21

Franklin and Bristol.....	13	35	3-69
Great Falls and Conway*.....	9	20	2-22
Manchester and Lawrence.....	26	65	2-50
New Hampshire Central*.....	10	30	3-00
Northern (Concord to W. Lebanon) 69	2 00	2-89	
Portsmouth and Concord*.....	18	50	2-77
Sullivan.....	25	75	3-00
Wilton.....	18		
Cheshire.....	43		
Eastern.....	16		
Nashua and Lowell.....	5½		
Nashua and Worcester.....	7		
Great Falls branch.....	3		

405½

VERMONT.

Connecticut and Passumpsic Riv. 40	1 25	3-10
Rutland and Burlington.....	120	3 60 3-00
Vermont Central.....	117	3 40 2-90
Connecticut River.....	10	

287

MASSACHUSETTS.

Berkshire.....	21		
Boston and Lowell.....	26	65	2-50
Woburn branch.....	2		
Boston and Maine, (74 in all).... 36	1 85	2-53	
Medford branch.....	2		
Lawrence branch.....	3½		
Boston and Providence, (43 in all) 37½	1 25	2-90	
Branches.....	12		
Stoughton branch.....	4		
Boston and Worcester.....	45	1 15	2-55
Brookline branch.....	1½		
Millford branch.....	13½	30	2-50
Newton branch.....	1½		
Saxonville branch.....	4	12	2-40
Millbury branch.....	4	15	3-75
Cape Cod branch.....	27	90	3-21
Cheshire, [54 in all].....	11	1 65	3-05
Connecticut River.....	50	1 50	3-06
Chicopee Falls Branch.....	2½		
Dorchester and Milton.....	3		
Eastern, Boston to Portsmouth, (54 in all).....	38½	1 50	2-77
Marblehead branch.....	3		
Gloucester branch.....	13½	40	3-00
Salisbury branch.....	3½	10	3-00
Essex (Salem to Lawrence).....	20	60	2-85
Fall River.....	42	1 05	2-50
Fitchburg*.....	51	1 30	2-60
Watertown branch.....	5		
Other branches.....	3½		
Fitchburg and Wor., (26 in all).... 14	75	2-88	
Lexington and West Cambridge.. 6½	30	3-75	
Lowell and Lawrence.....	13	35	2-69
Nashua and Lowell, (15 in all).... 9½	40	2-66	
New Bedford and Taunton.....	31	90	2-90
Branch.....	1		
Newburyport and Georgetown.... 8			
Norfolk County, (36 in all).....	26	1 00	2-85
Norwich and Worcester, (66 in all) 17	1 25	2-00	
Old Colony (Boston to Plymouth) 37½	1 13	3-02	
Bridgewater branch.....	8	25	3-57
Peterboro' and Shirley.....	12	30	2-50
Pittsfield and North Adams.....	20	60	3-00
Providence and Wor., (43½ in all) 26½	1 30	3-02	
Quincy.....	3		
South Shore.....	11½	35	2-91
Stockbridge and Pittsfield.....	25	75	3-00
Stony Brook.....	17	40	2-35
Western, Boston to Albany, (200 in all).....	117	5 00	2-50
West Stockbridge.....	2½		
Worcester and Nashua, (45½ in all) 38	1 25	2-77	
Springfield and Hartford, (62 in all) 5			
Vermont and Massachusetts.....	59	1 75	2-53
	993½		

CONNECTICUT.

Canal railroad*.....	45	1 50	3-13
Collinsville branch.....	8	25	3-00
Hartford, Providence and Fishkill* 45	88	2-00	
Housatonic.....	74	2 00	3-70
Naugatuck.....	62	1 50	2-63
New Haven, Hartford and Spring. 57	1 75	2-83	
Middletown branch.....	10	30	3-00
N. London, Willimantic and Pal. 48	1 25	2-60	
New York and New Haven.....	47	1 50	1-98
Stonington.....	5½	1 50	3-00

Norwich and Worcester..... 49

450½

RHODE ISLAND.

Providence and Worcester..... 17

Stonington..... 44½

61½

NEW YORK.

Albany and Schenectady..... 17 40 2-94

Albany and West Stockbridge..... 38½ 95 2-50

Attica and Buffalo..... 31½ 90 2-90

Auburn and Rochester..... 78 2 50 3-20

Auburn and Syracuse..... 26 80 3-07

Buffalo and Niagara Falls..... 22 75 3-40

Buffalo and Black Rock..... 3

Cayuga and Susquehanna..... 28 1 90 3-00

Chemung..... 17½ 50 2-33

Hudson and Berkshire..... 31½ 1 00 3-03

Hudson River*..... 75 1 00 1-33

Lewiston..... 3½

Lockport and Niagara Falls..... 24 75 4-12

Long Island (Brooklyn to Green't) 98 2 00 2-10

New York and Erie*..... 294

N.Y. to Piermont, S. B. route, (25 miles)..... 6 15 2-04

Newburgh Branch..... 10 45 2-36

New York and Harlem*..... 80 1 65 2-06

Northern,* (Rouse's Point to Cha-teaugay)..... 41

Oswego and Syracuse..... 35 1 00 2-85

Rensselaer and Saratoga..... 25 75 3-00

Saratoga and Washington..... 39½ 1 50 3-75

Schenectady and Saratoga..... 22 75 3-40

Schenectady and Utica..... 78 2 25 2-84

Skaneateles..... 5

Tonawanda, (Batavia to Attica)..... 43½ 1 30 3-03

Troy and Greenbush..... 6 15 2-50

Troy and Schenectady..... 20½ 50 2-50

Tioga Coal and Iron railroad..... 15

N. York and N. Haven, [76 in all] 15

Syracuse and Utica..... 53

1285½

NEW JERSEY.

Burlington and Mt. Holly..... 6 25 4-09

Camden and Amboy..... 62

Amboy to N. York, steamboat route, (28 miles)..... 3 00 3-33

Trenton Branch..... 6

Morris and Essex..... 36 1 00 2-77

New Brunswick and Trenton..... 29

New Jersey..... 31 50 1-61

New Jersey Central..... 36

Paterson and Hudson..... 17 50 3-00

Ramapo and Paterson..... 16 50 3-30

239

PENNSYLVANIA.

Alleghany and Portage..... 36

Beaver Meadow..... 26

Carbondale and Honesdale..... 16

Columbia and Philadelphia..... 82 2 37 2-88

Westchester Branch..... 9 25 2-77

Corning and Blossburg..... 25 1 50 3-75

Cumberland Valley..... 56 2 12 3-78

Hazleton and Lehigh..... 10

Little Schuylkill..... 20 75 3-75

Mine Hill..... 12 50 4-00

Mount Carbon..... 7

Pennsylvania* 134..... 97 4 00 3-50

Phil., Reading and Pottsville..... 92 3 50 3-80

Phil. and Norristown..... 17 40 2-35

Germantown Branch..... 6 15 2-50

Phil. and Trenton..... 30 75 2-50

Phil. Wil. and Balt..... 98 3 00 3-06

Schuylkill Valley..... 14

Summit Hill and Mauch Chunk..... 9 25 2-77

Whitehaven and Wilkesbarre..... 20

Williamsport and Elmira..... 25 1 25 5-00

Franklin..... 22

Philadelphia and Westchester..... 11

740

DELAWARE.

New Castle and Frenchtown..... 16 75 4-68

MARYLAND.

Annapolis and Elkridge..... 21 90 4-28

Baltimore and Ohio*..... 179 7 00 3-91

Washington Branch..... 31 1 40 4-50

Frederick Branch..... 3

Baltimore and Susquehanna..... 71 2 12 3-00

Westminster Branch..... 10

315

VIRGINIA.

Appomattox..... 10 50 5-00

Central Virginia..... 71 3 66 5-15

Chesterfield..... 12

Greenville and Roanoke..... 21 50 2-38

Petersburg..... 63 1 50 2-38

Richmond, Fred. and Potomac..... 76

Richmond and Petersburg..... 22 1 00 4-54

Winchester and Potomac..... 32 2 00 6-25

307

NORTH CAROLINA.

Gaston and Raleigh..... 87 4 00 4-59

Wilmington and Weldon..... 162 5 00 2-50

249

SOUTH CAROLINA.

Columbia and Greenville..... 22

South Carolina..... 136 5 00 3-67

Columbia Branch..... 68 2 70 4-00

Camden Branch..... 38 1 50 4-00

262

GEORGIA.

Central Georgia..... 191 5 75 3-00

Georgia..... 171 5 00 2-92

Macon and Western..... 101 4 00 3-96

Western and Atlantic..... 140 4 20 3-00

Athens branch..... 39

Rome branch..... 18

660

ALABAMA.

Montgomery and West Point..... 68 3 50 5-14

Tusculumbia and Decatur..... 44

112

MISSISSIPPI.

Vicksburg and Jackson..... 60 2 75 4-58

LOUISIANA.

Clinton and Port Hudson..... 24 1 00 4-16

Mexican Gulf..... 27 50 1-85

Milneburg and Lake Ponchartrain..... 6 12 2-00

New Orleans and Carrollton..... 6 15 2-50

West Feliciana..... 26 1 50 5-76

89

KENTUCKY.

Lexington and Ohio*..... 28 1 00 3-57

Louisville and Frankfort*..... 27

55

ILLINOIS.

Galena and Chicago*..... 42 1 25 2-97

Sangamon and Morgan..... 55 2 25 4-00

97

INDIANA.

Madison and Indianapolis..... 86 2 50 2-90

Shelbyville Branch..... 16 50 3-01

102

OHIO.

Cleveland and Columbus*..... 26

Dayton and Springfield..... 25

Little Miami..... 84 2 50 2-97

Mad River and Erie..... 134 4 50 3-35

Mansfield and Sandusky..... 56 1 50 2-67

Kenia and Columbus..... 54 1 64 3-03

Findlay Branch..... 20

Erie and Kalamazoo..... 15

414

MICHIGAN.

Detroit and Pontiac..... 25 1 00 4-00

Michigan Central..... 218 6 50 2-98

Tecumseh branch..... 8

Michigan Southern..... 66

317

* Railroads unfinished, July, 1850.

† Double track.

RECAPITULATION.

	Miles.
Maine.....	225
New Hampshire.....	405½
Vermont.....	287
Massachusetts.....	993½
Rhode Island.....	61½
Connecticut.....	450½
Total.....	2423

New York.....	1285½
New Jersey.....	239
Pennsylvania.....	740
Delaware.....	16
Maryland.....	315
Virginia.....	307
North Carolina.....	249
South Carolina.....	262
Georgia.....	660
Alabama.....	112
Mississippi.....	60
Louisiana.....	89
Kentucky.....	55
Illinois.....	97
Indiana.....	102
Ohio.....	414
Michigan.....	317
Total.....	5319
Total.....	2423
Total.....	7742

Adding to the above the various coal roads in the country, would give an aggregate of about 8,000 miles.

The whole amount expended upon roads in operation cannot be far from \$300,000,000.

New York takes the lead in the extent of her roads, and will probably maintain her position as the first Railroad State in the Union, for an indefinite period. Ohio will soon follow as the second, Pennsylvania the third, and Georgia the fourth.—Massachusetts must soon lose her relative position from the smallness of her territory. Connecticut bids fair to have the most in proportion to her area and population.

It is difficult to ascertain the extent of railroads in progress. It cannot, we think, be less than 5000 miles. Every year increases the number of the projects; and unless the demand which they make upon the capital of the country should have the effect to cripple their operations, it is difficult to estimate the extent to which these works will be carried in the next ten years.

Railway Consolidation.

The preliminary arrangements for the consolidation of the Auburn and Syracuse and Auburn and Rochester railway companies, have been perfected, the articles of association having been executed, so that on the 1st of August the Rochester and Syracuse railroad company will supersede the two existing corporations and go into full effect.

The Rochester Advertiser says: "the directors named in the new articles of association are—H. B. Gibson, Charles Seymour, Henry Fellows, William J. B. Mercer, Jacob Gould, E. Darwin Smith, Nathaniel Thayer, William F. Weld, R. H. Ives, John Wilkinson, Joseph B. Varnum, W. J. Van Allen and Thos. Y. How."

Judge Hall, President of the Evansville and Illinois railroad company, has just closed a contract with a mercantile houses in this city for railroad iron to complete the road from the city of Evansville to Princeton, a distance of nearly twenty-seven miles. We understand that the iron is to be shipped from a port in Europe, between this and the 1st of December next, and is to be delivered at

New Orleans; it is to be paid for in bonds issued by the city of Evansville, running ten, fifteen and twenty years, bearing seven per cent. interest, payable semi-annually in this city. The law that authorises the issuing of these bonds, requires a tax to be assessed on the taxables in the city of an amount sufficient to pay the interest as it falls due, and to create a sinking fund to redeem the principal when due. The rapid growth of the city of Evansville, its great increase in wealth and population, must render these bonds as good stock as can be found in the market.

Life of Richard Trevithick, C. E.

BY HYDE CLARKE, ESQ.

RICHARD TREVITHICK was the son of a Cornish engineer, and born, we believe, at Camborne, in Cornwall. He was brought up for the pursuits he followed, in the usual way, as a clerk or assistant in the mine counting house, having as one of his colleagues Richard Griffiths, now the chief government engineer in Ireland.

Shortly after 1790, he joined and assisted Wm. Bull, a Cornish engineer. Bull had been a workman engaged in erecting Watt's engines in Cornwall,* and when the war of the mine owners began to defeat Watt in his patent rights, Bull was one of the engineers employed to fight the battle, and construct engines, which should be beyond the patent. Having obtained the assistance of Trevithick, many engines were made under their united direction, and erected in the county. In 1792, Trevithick was employed to report on one of Hornblower's engines at Tincroft mine, near Redruth. On this he reported, that the duty of Hornblower's engine was 16 to 10 over Watt's.

At this time the most bitter feeling prevailed in reference to Watt's patent rights. The mine owners, when they had derived the benefit of the improvement, grudged the remuneration, and the Cornish engineers, with the strong local feeling which then prevailed, looked with anything but pleasure on the intrusion of foreigners in what they considered their country. The Cornish engineers participated to some extent in this feeling, and were arrayed, as a man, in the contest with Watt, in which they were made the tools of the dirty and greedy practices of the mine owners. The Watt party were able to retaliate in time, and their northern adherents have exercised a serious retribution; for whenever the name of a Cornish engineer comes before them, they never fail to decry his claims, and to blacken his reputation. This in a great degree accounts for the great neglect of Trevithick, whose share in the Watt quarrel was never forgiven or forgotten, particularly when he became the decided champion of the high pressure system.

The history of the Cornish engineers, with the exception of Mr. Stuart's "Anecdotes of the Steam Engine," an excellent and impartial book, has been written only by the Cornishmen themselves, and the valuable treatise, by Professor Pole, on the Cornish Engine, the Appendix G. to Weale's "Tredgold," must be looked upon as a Cornish work. Thus, but scanty and partial justice has been awarded to such men as Richard Trevithick, Arthur Woolf, Jonathan Hornblower, Andrew Vivian, Jabez Carter, Henry Vivian, Captain Joel Lean, and William Sims. On the life of Richard Trevithick no book has yet been published, and there are only two memoirs by the author of the present, one in the second volume of the *Civil Engineer and Architect's Journal*, and one in the fifth volume of the *Railway Register*, though we hope this will be supplied, as the Institute of Civil Engineers have offered a prize for a memoir of the great engineer.

After Trevithick's partnership with William Bull had come to a close, he engaged in another with Andrew Vivian, an engineer. Andrew Vivian is said to have been a cousin of Trevithick's and was the monied partner in the concern, which was carried on at Camborne. In 1802, Trevithick and Vivian, in co-partnership, took out a patent for the application of the high pressure principle in the steam engine. This is the era from which the

high-pressure engine, in its various forms, takes date, and it deserves a little attention at our hands.

This patent is also the first one taken out for a locomotive engine, and the specification is dated March 24, 1802. The patent is described "as for improving the construction of steam engines, and the application thereof for drawing carriages on rails and turnpike roads, and other purposes." It is said that their engine will produce "a more equable rotary motion on the several parts of the revolutions of any axis which is moved by the steam engine, by causing the piston rods of two cylinders to work on the said axis, by means of cranks at a quarter turn asunder." The steam was proposed to be worked high pressure or not.* If the former, at a pressure from 60 to 80 lbs. on the square inch, and the boiler was made of a cylindrical form, to bear the expansive action of strong steam, having a bent tube, like the letter U within it, to increase the heating surface. The furnace was placed within the boiler, as now in the common marine boiler. To get a greater draught in the smoke flue, it was proposed occasionally to blow the fire with bellows, worked by the piston or crank of the engine. The cylinder of the engine was immersed in the boiler, as has since been frequently done.

As a provision against explosion, when high pressure steam was used, a second safety valve was provided, not under the control of the engine driver, a plan which is now adopted with every locomotive engine.

The introduction of Trevithick's improvement gave increased power to steam, and it is of that importance, that Stuart, no mean authority on historical points, and not likely, from national sympathy, to underrate low pressure, or overrate high pressure, is inclined to date the era of the steam engine from this invention.† In the establishment of the locomotive, in the development of the powers of the Cornish engine, and in increasing the capabilities of the marine engine, there can be no doubt that Trevithick's exertions have given a far wider range to the dominion of the steam engine than even the great and masterly improvements of James Watt effected in his day.

That Trevithick's application was original there can be no doubt. He had never heard of Leupold, nor of Oliver Evans, nor was he likely to do so until the close of his life. It is the opinion of the best authorities—and it is only contested, without any reason assigned, by Dr. Alban—that Trevithick was the true inventor of the high pressure engine.

Watt conceived the application of high pressure steam, but was unable to carry it out; he also, in 1769, conceived the use of the locomotive, but never attempted to make one. In 1787, Symington is said to have shown a model. A little later, William Murdoch, then living at Redruth, likewise constructed a model. This, no doubt, Trevithick saw. Oliver Evans also had an idea of applying steam for locomotion. The first locomotive, however, which was made, was that by Trevithick, and it was run by Trevithick and Vivian from Camborne to Plymouth. On the road, whilst the vehicle was at the top of its speed, and had just carried away part of the rails of a gentleman's garden, Captain Vivian saw ahead of them a closed tollbar, and called to Captain Trevithick, who was behind, to slacken speed, which he did, and at length came dead up on the right side of the gate, which was opened, like lightning, by the toll keeper. "What have us got to pay here?" asked Captain Vivian. The poor toll keeper, trembling in every limb, and his teeth chattering in his head, strove to answer, "Na-na-na-na." "What have us got to pay, I say?" "Na—no—nothing to pay! My de—dear Mr. Devil, do drive on as fast as ever you can! Nothing to pay!"‡

On arriving at Plymouth, the carriage was shipped in a vessel belonging to a Captain Vivian, and carried to London, where it was run in the streets.

The engine used was about the size of an orchestra drum, and was attached to a phaeton, before the back wheels. With this carriage an ex-

periment was made in Lord's cricket ground, at Marylebone, several men of science alternately steering it, and expressing their perfect satisfaction as to the ease with which it was directed.* Hence it was steered down the New Road, and Gray's Inn Lane, to the coach builder's, whence the phaeton had been obtained. Thus, as has been remarked, it passed over ground since the site of Hancock's experiments, and perhaps destined, in the end, to witness the great triumph of steam locomotion on the common road. The day after the first trial, Trevithick took the small engine, and exhibited it in a cutler's shop, working the machinery which was part of his course of experiment, to show the applicability of the principle for various purposes.

At a subsequent period a temporary tram road was constructed within an enclosure, on the ground now occupied by Euston square and the London and Northwestern railway, close to that spot where the genius of a Stephenson was one day to complete the triumph of the railway locomotive system. We hope the day is not far distant when, on the magnificent propyleum of the terminus, we shall see statues of Trevithick and Stephenson looking down on the scene of their peaceful glories.

The tram road was opened to the public as an exhibition, and on the road, which was of an elliptical form, Trevithick ran his locomotive. Crowds went to see him; but on the second day, Trevithick, in a freak, removed the engine and closed the place. This he is said to have done under the impression that it was better to let the affair drop until he saw a fitting opportunity to avail himself of it advantageously.*

In 1804, Trevithick and Vivian constructed a locomotive for the Merthyr Tydvil railway, in South Wales, to move railway carriages. It was the first railway locomotive. The cylinder was placed horizontally, as in locomotives now used. The heads of the piston rod and connecting rod were divided or forked, leaving room for the motion of the extremity of the crank, and giving motion to it, fixed on an axle tree; on this axle cog wheels were placed, working into cog wheels on the axle of the hind wheels.† This locomotive engine had only one cylinder of eight inches diameter; whereas, since, the power of the locomotive has been increased to two cylinders of eighteen diameter. In most essential particulars, this engine resembled those now in common use.‡

At its first trial, Trevithick's locomotive drew, on a level plane, as many carriages as carried ten tons of bar iron a distance of nine miles, without requiring any fresh supply of water, travelling at the rate of five miles an hour.

Trevithick sent another locomotive to Mr. Blackett, at Wylam, the birthplace of George Stephenson, but this likewise, through some blunder, failed, and was set to blow a cupola in an iron furnace. In 1814, Mr. Blackett made another on the same plan, which worked, and on which Geo. Stephenson founded his improved plan.

In February, 1806, Trevithick, in a letter to Mr. Davies Gilbert, states that he was about to enter into a contract with the Trinity Board for lifting the ballast out of the bottom of the Thames, for all the shipping. The first quantity stated was 300,000 tons a year, but they afterwards stated 500,000 tons a year. He was to do nothing but wind up the chain, for 6d. per ton, which was then done by men, who never lifted it above 25 feet high. A man could then get up ten tons for 7s.; whereas, Trevithick considers that his engine at Dolcoath lifted above 100 tons that height with one bushel of coals.

He had then two engines already finished for that purpose, and was to be in town in about fifteen days (that is on the 5th March, 1806), to set them to work. The contract was to be for twenty-one years, and he expressed himself satisfied with the terms. What became of Trevithick's ballast-engines we do not know, but we believe litigation ensued.

* Civil Engineer and Architect's Journal, vol. 2, p. 94.

† Ritchie on the Steam Engine, p. 207.

‡ Nicholson's Journal, vol. 12, p. 1.

§ This arrival seems to have been delayed, as in another letter. See Appendix G. to Tredgold.

* Richie on Railways, p. 205.

† Historical and Descriptive Anecdotes of the Steam Engine, by R. Stuart.

‡ Colridge's Six Months in the West Indies.

* Pole on the Cornish Engine, Appendix G. to Tredgold, p. 37.

At this time Trevithick had received orders for nine engines within a month, all for Cornwall, and he expected orders for four more.

He was then engaged on a railway, as appears from one of his letters.

From the same source we learn that a person in Wales owed him £6000 for patent premium, and disputed his patent.

To be continued.

Railroad Iron.

THE Undersigned, Agents for Manufacturers, are prepared to contract for the delivery of English, Welsh and Scotch Rails, of any pattern and weight, also for every description of Welsh, Scotch and Swedish Iron, Railway Chairs and Spikes, Rivets, Bolts, Nuts, Washers, Chain Cables, Anchors, Tin Plates, German Spelter, Iron Castings, and every description of Machinery.

WILLIAM BIRD & CO.,

Iron and Tin Plate Merchants,

44 Wall st., New York.

And at 5 Martin's Lane, London,

and 140 Buchanan st., Glasgow.

July 27th, 1850.

MINING AGENCY.

Capt. O. H. Matthews,

Civil and Mining Engineer, F. G. S., London, etc.

HAVING completed his three years engagement on Lake Superior, is open to negotiate for another appointment as Mining Agent, or Superintendent of Mines. Also, to give his opinion and advice upon Mineral Lands, to Buyers and Sellers of Stock, or to be consulted on any section in this important branch of national industry.

The most implicit confidence may be relied on, and immediate attention given to all communications (pre paid). Address Capt. O. H. Matthews, Toronto, July 27th, 1850.

Coal.

CUMBERLAND SEMI-BITUMINOUS COAL superior quality for Locomotives, for sale by H. B. TEBBETTS,

No. 40 Wall St., New York.

May 12, 1849.

FARMERS! ATTENTION!!

John Mayher & Co's

NEW AGRICULTURAL WAREHOUSE AND SEED STORE,

197 WATER STREET, NEW YORK.

Where they have for Sale, the largest and most complete assortment of Farming Implements, ever offered for sale in this city—all of which they will sell 10 per cent. Cheaper than the same kind of Goods can be bought at any other house in the city. Our Goods are all Warranted to give satisfaction.

FARMERS wanting to purchase, will please call and examine our Stock before buying elsewhere.

Among our assortment may be found the Celebrated Highest Premium Eagle Ploughs! together with all the most approved Ploughs now in use.

Also,—Horse Powers, Threshing Machines, Fan Mills, Corn Shellers, Straw Cutters, Corn Mills, Seed Sowers, Churns, Ox Yokes, Ox Scrapers, Hay Rakes, Horse Rakes, Patent Chain Pump (that never freezes nor rusts), and other Pumps; in fact we have everything for Farming Purposes—together with Guano, Bone Dust and other Fertilizers.

JOHN MAYHER & CO.,
197 Water st., N. Y.

February 9, 1850.

N.B.—J. M. & Co. also continue their Old Stand, at 195 Front street, near Fulton Market.

To the Proprietors of Rolling Mills and Iron Works.

THE Undersigned—Proprietors of Townsend's Furnace and Machine Shop, Albany—are extensively engaged in the manufacture of Machinery and fixtures for Iron, and Copper Rolling Mills, and Iron Works. Having paid particular attention to the manufacture of *Rolls* (Rollers), both *chilled* and *dry-sand*, they feel confident that they can execute orders for such castings in a satisfactory manner. And to give assurance of this, they beg leave to refer to the following named persons, proprietors and managers of some of the most extensive rolling mills in the country, viz: Jno. F. Winslow, J. Tuckerman, H. Burden, W. Burt, J. & J. Rogers, Saltus & Co., J. B. Bailey, L. G. B. Cannon, Hawkins & Atwater, etc., etc.

F. & T. TOWNSEND.

Albany, August 18, 1849.

Gloucester Iron Works, GLOUCESTER, NEW JERSEY, NEARLY OPPOSITE PHILADELPHIA.

THE subscribers having made extensive alterations in their works, are now prepared to receive orders for all kinds of Stationary and Marine Engines, Boilers, Locomotives, Sugar Mills, and every description of Mill Work.

Also—Orders for Iron and Brass Castings executed with despatch.

Having secured the valuable services of Mr. David Matthew as Superintendent (who has been for five years foreman in the Iron Works of John Watchman, now the Vulcan Works, Baltimore, and for 12 years superintendent of the Mohawk and Hudson and the Utica and Schenectady Railroads, New York,) they feel confident that all orders entrusted to them will be faithfully executed.

Having an extensive Wharf in front of their works, it will afford a safe harbor for all classes of steam vessels that may require repairs during the winter.

C. M. & J. C. SITER.

Im.

Gloucester, July 24, 1850.

Ray's Patent India Rubber Car Springs.

Savannah, Ga., May 22, 1850.

FOWLER M. RAY, Esq.,

Dear Sir: I have no hesitation in saying, after having used on our road your springs and Fuller's, that I consider yours decidedly the best in every particular, and in this opinion I am sustained by all our officers. Fuller's spring has a tendency to split, and also to chafe or abrade by the constant friction on the cast iron plates or disc: and in my opinion is not near so elastic as yours.

Your springs, which have been in use on our road for 12 or 15 months past, and in constant use under both passenger and freight cars, are to all appearances as elastic, sound and good, as when first put in use.

We are now building eighty-five new cars, of which for fifty-sets the springs have been ordered of you.

GEORGE A. ADAMS,

Master Carpenter,

Central Railroad and Banking Co. of Georgia.

Connecticut River Railroad Office,
Northampton, May 4, 1850.

E. CRANE, Esq.,

Dear Sir: It is now about two years since I first tried the experiment of using a set of Ray's India-rubber Springs upon one of our merchandise cars, and although the car has been in constant service since that time, I do not on examination find the slightest difference either in the thickness or elasticity of the material.

The same result has followed wherever we have applied them, either for wheel or draw springs on Engines, Tenders or Cars. At present we use no other; either in replacing old springs or building new cars—and I am perfectly satisfied that for economy, durability, safety, and ease of motion, that Ray's India-rubber is the best article for Springs which has been presented to the public.

Yours respectfully, J. HUNT,
Supt. Connecticut River Railroad.

EDWARD CRANE, Esq.,

Dear Sir: Having applied to cars of the Boston and Worcester Railroad Corporation, Ray's Vulcanised Rubber Springs (where they have been in use for some two years last past), I have had occasion to observe their operation, and am free to say in answer to your inquiries, that they retain their elasticity perfectly during all changes of atmospheric temperature: and are in my opinion a most valuable acquisition to Railroad Cars—are not liable to derangement, as is the case with steel springs; while at the same time it costs less to apply them. Respectfully yours,

D. N. PICKERING,
Supt. Motive Power, Bos. & Wor. Railroad.
Boston, April 15th, 1850.

Ibbotson, Brothers & Co's CELEBRATED CAST STEEL

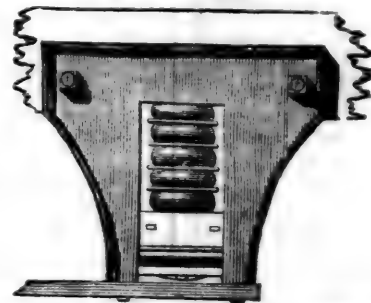
AND

Best Cast Steel Royal Improved Files, well known as better adapted for Engineers' and Machinists' purposes than any now in use in the United States.

Every description of Square, Octagon, Flat and Round Cast Steel, Sheet, Shovel and Railway Spring Steel, etc., and Steel to order for any purposes—manufactured at their works in Sheffield—and universally known by the old stamp "Globe."

HENRY J. IBBOTSON, Agent,
218 Pearl st., New York.

FULLER'S PATENT INDIA RUBBER SPRING.



THESE SPRINGS ARE THE CHEAPEST, the lightest and most durable of any yet known. They are easily applied to new or old cars, and there is small possibility of any accident occurring to them.

Other parties through Mr. Ray set up claims to an India Rubber Spring which, though the same in principle, is very inferior in its working and durability. Actions are in progress for an Infringement on Fuller's Patent against parties using that Spring.

The superiority of Fuller's Spring over that claimed by Mr. Ray is fully established and has frequently been testified to. The following are from gentlemen who have had much experience with both Springs.

"It will afford me pleasure to recommend your springs to the companies in this region, in preference to Ray's which I am confident are inferior in mechanical arrangement to yours."

JOHN M'RAE,

Engineer S. Carolina R. R., Charleston.

"I do not hesitate to allow you to say that I concur in Mr. M' Rae's opinion that Ray's springs are inferior in mechanical arrangement to Fuller's. I repeatedly expressed that opinion long before Mr. M' Rae had seen your springs (as I believe) and entertain it still."

WM. PARKER,

Gen'l Supt. of Baltimore and Ohio R. R.

Office of Sup't Norwich & Worcester R.R. Co. }
December 26, 1849.

"I most fully concur in the opinion of Jno. M' Rae, Engineer of S. Carolina Railroad, that 'Ray's Springs are inferior to Fuller's Springs,' and shall with pleasure recommend them to all Railroad Companies for adoption. I have used both springs on this road and have no hesitation in saying that I should in all cases prefer Fuller's Spring."

SAM'L H. P. LEE, JR.,

Sup't and Engineer.

Office B. & P. R. R. Co. }
Boston, 20th December, 1849.

"This company have cars fitted up with both Ray's and Fuller's 'Metallic India Rubber Springs,' and I do not hesitate to say that Fuller's arrangement is very much superior to Ray's."

W. RAYMOND LEE, Supt.

The following result has been obtained by experiment upon one railroad.

A set of Trucks fitted with Steel Springs cost	\$190.77	and weigh	2355 lbs.
The same with Fuller's Springs,	131.71	"	1911 lbs.
Difference,	\$59.06	"	444 lbs.

Not only is there an advantage in the cost, but owing to the great reduction in weight, the car can be made lighter throughout, and so an enormous saving in weight may be effected in a Train.

AGENTS.

G. M. KNEVITT, 23 Broadway, N. Y.,
JOHN THORNEY, 110 Chestnut St., Philad.
THE BOSTON BELTING CO., Milk st., Boston.
January 2, 1850.

American Cast Steel.

THE ADIRONDAC STEEL MANUFACTURING CO. is now producing from American iron, at their works at Jersey City, N.J., Cast Steel of extraordinary quality, and is prepared to supply orders for the same at prices below that of the imported article of like quality. Consumers will find it to their interest to give this a trial. Orders for all sizes of hammered cast steel, directed as above, will meet with prompt attention.

May 28, 1849.

RAILROAD CAR AND COACH TRIMMINGS.

Doremus & Nixon,
IMPORTERS AND FURNISHERS

HAVE FOR SALE

Plain Garnet Plush. Fig. Garnet Plush (Butterfly pat.
" Crimson " " Crimson " (Elegant.
" Scarlet " " " " (Gen. Taylor.

BROCATELLES.

Crimson Silk Brocatelles. Gold and Maroon do.
Gold and Blue " " Brown "
Silk and Wool " of every color.

MOQUETTES,

Of elegant designs and colors.

GERMAN CLOTH FOR CAR LININGS.

The most beautiful goods ever shown in this country, and the subscribers are the sole agents for the sale of them.

Oil cloths Enamelled with Gold. } These goods can be
" " Silver. } furnished in any
Do. Silver ground velvet printed. } dimensions req'd.

CURLED HAIR

Of every description and quality.

JNO. W. A. STRICKLAND, Agent.
New York, 1880. 1yl6

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Clement, Wm. H.,

Little Miami Railroad, Cincinnati, Ohio.

Cozzens, W. H.,

Engineer and Surveyor, St. Louis, Mo.

Alfred W. Craven,

Chief Engineer Croton Aqueduct, New York.

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Eckhart Mines, Alleghany Co., Maryland.

Fisk, Charles B.,

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Gzowski, Mr.,

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Rutland and Burlington Railroad, Rutland, Vt.

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Nott, Samuel,

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Roebbling, John A.,

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Steele, J. Dutton,

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Tinkham, A. W.,

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Thomson, J. Edgar.,

Pennsylvania (Central) Railroad, Philadelphia.

Troost, Lewis,

Alabama and Tennessee Railroad, Selma, Ala.

Whipple, S.,

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Williams, E. P.,

Auburn and Schenectady Railroad, Auburn, N. Y.

Williams, Charles H.,

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HOTELS.

MANSION,

Corner of Main and Exchange Streets,
P. DORSHIMER. BUFFALO.

GUY'S

United States Hotel,

(Opposite Pratt street Railroad Depot.)
BALTIMORE.

JOHN GUY.

WILLIAM GUY.

American Hotel,

Pratt street, opposite the Railroad Depot,
BALTIMORE.

HENRY M. SMITH.....Proprietor.
Late of the Exchange & St. Charles Hotels, Pittsburg.

Washington Hotel,

BY JOHN GILMAN,

\$1 Per Day.

No. 206 Pratt street, (near the Depot.)
BALTIMORE.

Barnum's City Hotel,

MONUMENT SQUARE, BALTIMORE.

This Extensive Establishment, erected expressly for a Hotel, with every regard to comfort and convenience, is situated in the centre and most fashionable part of the city, and but a few minutes' walk from the Railroad Depots and Steamboat Landings.

The House has lately undergone a thorough repair, embracing many valuable improvements, and will accommodate 250 Guests. BARNUM & CO.

JONES' HOTEL,

NO. 152 CHESTNUT STREET,
PHILADELPHIA.

BRIDGES & WEST, Proprietors.

Fountain Hotel,

LIGHT STREET, BALTIMORE,
P. THURSTON.....Proprietor.

DUNLAP'S HOTEL,

On the European Plan,
NO. 135 FULTON STREET,
Between Broadway and Nassau St.,
NEW YORK.

BUSINESS CARDS.

J. T. Hodge

Will attend to the examination of mining tracts near Lake Superior, and prepare Reports and Maps.
Address, during the Summer,
Ontanagon Postoffice, Lake Superior.

Cumberland Steam Coal,

FROM THE
FROSTBURG MINES, MD.

H. A. TUCKER,

Agent of Frostburg Coal Co.
No. 50 Wall Street, New York.

Eaton, Gilbert & Co.,

Railroad Car, Coach and Omnibus Builders,
TROY, N. Y.

Nathan Caswell,

METAL BROKER, 69 WALL ST., N. Y.

For the Purchase and Sale of Railroad Iron (new and old,) Boiler Plates, Pig and Bar Iron, Lead, Tin, Copper, Spelter, etc. Refers to

Messrs. Boorman, Johnston, & Co., New York.

" Grinnell, Minturn & Co., "

" Barston, Pope & Co., "

" Earps & Brink, Philadelphia.

" E. Pratt & Brother, Baltimore.

John Barstow, Esq., Providence.

Lewis Bullard, Esq., Boston.

February 9, 1880.

6m*

United States Railroad Guide and Steamboat Journal.

CONTAINING OFFICIAL TIME ADVERTISEMENTS,
Tables of Stations, Distances, Fares, Time, etc.,
with much miscellaneous matter for the travelling public. Price 12 cents a copy. Yearly subscription \$1.
Published at 43 Ann street, New York.

STEEL AND FILES.

R. S. Stenton,

20 CLIFF STREET, NEW YORK,

AGENT FOR

J. & Riley Carr's

BAILEY-LANE WORKS, SHEFFIELD,
Manufacturers of Cast, Shear, German and Blister

STEEL

Of all descriptions. Warranted Good

FILES.

Manufacturers of Machinists' Warranted Best Cast Steel Files, expressly for working upon Iron and Steel, made very heavy for recutting.

A full Stock of Steel and Files at all times on hand. 6m4

Walter R. Johnson,

CIVIL AND MINING ENGINEER AND ATTORNEY for Patents. Office and Laboratory, F St., opposite the Patent office, Washington, D. C.

Dudley B. Fuller & Co.,
IRON COMMISSION MERCHANTS,
No. 139 GREENWICH STREET,
NEW YORK.

Manning & Lee,
GENERAL COMMISSION MERCHANTS,
NO. 51 EXCHANGE PLACE,
BALTIMORE.

Agents for Avalon Railroad Iron and Nail Works, Maryland Mining Company's Cumberland Coal 'CED'—'Potomac' and other good brands of Pig Iron.

Cop Waste.

CLEAN COP WASTE, suitable for cleaning Railroad, Steamboat and Stationary Engines, constantly on hand and for sale by

KENNEDY & GELSTON,
54 Pine St., New York.

October 27, 1849,

3m

**Railroad Car Manufacturer's
Furnishing Store.**

F. S. & S. A. MARTINE,

IMPORTERS AND MANUFACTURERS OF

**RAIL ROAD CAR &
CARRIAGE LININGS,**

PLUSHES, CURTAIN MATERIALS, ETC.,
112 WILLIAM ST., NEAR JOHN.

3-4 and 6-4 Damasks, Union and Worsted; Mo-
reens, Rattinets, Cloths, Silk and Cotton Velvets,
English Buntings

Samuel Kimber & Co.,

COMMISSION MERCHANTS

WILLOW ST. WHARVES, PHILADELPHIA.

AGENTS for the sale of Charcoal and Anthracite

A Pig Iron, Hammered Railroad Car and Locomotive

Axles, Force Pumps of the most approved con-
struction for Railroad Water Stations and Hydraulic

Rams, etc., etc.

July 27, 1849.

James Herron, Civil Engineer,

OF THE UNITED STATES NAVY YARD,

PENSACOLA, FLORIDA.,

PATENTEE OF THE

HERRON RAILWAY TRACK.

Models of this Track, on the most improved plans,
may be seen at the Engineer's office of the New York
and Erie Railroad.

To Railroad Companies.

—WROUGHT IRON WHEELS—

SAFETY AND ECONOMY.

NORRIS LOCOMOTIVE WORKS,

SCHENECTADY, NEW YORK,

Are Manufacturing Wrought Iron Driving, Truck,
Tender, and Car Wheels—made from the best Ameri-

can Iron. Address **E. S. NORRIS.**

May 16, 1849.

George O. Robertson,

BROKER IN SCOTCH AND

AMERICAN PIG IRON;

Bar Iron, Lead, Spelter, Tin, Copper, etc.,

No. 4 Liberty Place, MAIDEN LANE,

(Near Broadway.)

NEW YORK

Manufacture of Patent Wire

ROPE AND CABLES,

For Inclined Planes, Suspension Bridges, Standing

Rigging, Mines, Cranes, Derrick, Tilters, &c., by

JOHN A. ROEBLING, Civil Engineer,

TRENTON, N. J.

Doremus & Harris,

ANALYTICAL & CONSULTING CHEMISTS,

179 BROADWAY, NEW YORK.

SCHOOL OF CHEMISTRY.

To Engineers and Surveyors.

E. BROWN AND SON Mathematical inst. mak-
ers No. 27 Fulton Slip, New York, make and keep

for sale, Theodolites, Levelling inst., Levelling rods,
Surveyors Compasses, and Chains, Cases of Mathe-

matical drawing insts. various qualities, together with
a general assortment of Ivory Scales and small insts.
generally used by Engineers.

Ranstead, Dearborn & Co.,

MANUFACTURERS OF

LOCOMOTIVE CRANKS AND CAR AXLES,

ALSO

WROUGHT IRON SHAFTING,

And All Kinds of Hammered Shapes.

Forge at Commercial Point, Dorchester,

Office 25 Foster's Wharf, opposite No. 211 Broad St.

BOSTON.

Henry J. Ibbotson,

IMPORTER of Sheffield and Birmingham Goods.

Also, Agent for the Manufacture of Telegraph

Wire. 218 PEARL ST., NEW YORK.

Cumberland, (Md.,) Coals for

Steaming, etc.

ORDERS RECEIVED FOR AND FILLED

by **J. COWLES, 27 Wall St., N. Y.**

Samuel D. Willmott,
MERCHANT, AND MANUFACTURER OF
CAST STEEL WARRANTED SAWS,

—AND FILES—

IMPORTER OF THE

GENUINE WICKESLY GRINDSTONES

NO. 8 LIBERTY STREET,

NEW YORK.

IRON.

Railroad Iron.

3,000 TONS C. L. MAKE 63 $\frac{1}{2}$ lbs. per yard,
now landing and to arrive.

Also contracts made for future delivery of above su-
perior make English Iron.

300 Tons Banks Best Iron, Round, Square and Flat.

200 " English Bar " " " "

10 " 9-16 Square Iron for Railroad Spikes.

For sale in lots to suit purchasers by

DAVID W. WETMORE.

New York, March 26, 1850.

Railroad Iron.

THE Undersigned, Agents for Manufacturers, are
prepared to contract to deliver Rails of superior
quality, and of any size or pattern, to any ports of dis-
charge in the United States.

COLLINS, VOSE & CO.,

74 South St.

New York, June 1, 1850.

Railroad Iron.

1,500 Tons weighing 58 lbs. per lineal yard.

500 " " 57 " "

500 " " 56 " "

500 " " 60 & 61 lbs. "

Also 2 $\frac{1}{2}$ flat rails. All the above being of approv-
ed patterns. For sale by

DAVIS, BROOKS, & CO.,

68 Broad street.

N.B.—Rails imported on commission, or at a fixed

price.

Iron.

Pig Iron, Anthracite and Charcoal; Boiler and Flue
Iron, Spring and Blistered Steel, Nail Rods, Best Re-
fined Bar Iron, Railroad Iron, Car Axles, Nails, Stove

Castings, Cast Iron Pipes of all sizes, Railway Chairs

of approved patterns for sale by

COLEMAN, KELTON & CAMELL,

109 N. Water St., Philadelphia.

IRONDALE PIG METAL, MANUFACTURED

and for sale by the Bloomsburg Railroad Iron Co.

LINDLEY FISHER, Treasurer.

75 N. Water St., Philadelphia.

Railroad Iron.

2,000 Tons, weighing 58 pounds per lineal yard,
of the most approved pattern of T rails, in

store and to arrive, for sale by

COLLINS, VOSE & CO.,

74 South St.

New York, June 1, 1850.

Railroad Iron.

1,675 Tons, weighing about 61 lbs. per yard, 90
tons, weighing about 52 lbs. per yard, and

825 tons, weighing about 53 $\frac{1}{2}$ lbs. per yard, of the lat-
est and most approved patterns of T rail, for sale by

BOORMAN, JOHNSTON & CO.,

119 Greenwich street.

New York, Feb. 25, 1850.

N.B.—B., J. & Co are also prepared to take con-
tracts for English rails, delivered in any of the Atlan-
tic ports of the United States.

Railroad Iron.

THE UNDERSIGNED, HAVING made arrange-
ments abroad, are prepared to contract for the de-
livery of Foreign rails, of approved brands upon the
most favorable terms.

They will also make contracts for American rails,
made at their Trenton works, from Andover Iron, in
whole or in part, as may be agreed upon.

They are prepared to furnish Telegraph, Spring and
Market Wire; Braziers and Wire Rods; Rivets and
Merchant Bars to order, all made exclusively from An-
dover Iron. The attention of parties who require iron

of the very best quality for special purposes, is respect-
fully invited.

COOPER & HEWITT,

17 Burling Slip, New York.

February 15, 1850.

Glendon Refined Iron.

Round Iron, Band Iron, Hoop Iron,

Square " Flat " Scroll "

Axles, Locomotive Tyres,

Manufactured at the Glendon Mills, East Boston, for

sale by **GEORGE GARDNER & CO.,**

5 Liberty Square, Boston, Mass.

Sept. 15, 1849.

**PATENT HAMMERED RAILROAD, SHIP &
BOAT SPIKES.**

—The Albany Iron Works

have always on hand, of their own manufacture, a

large assortment of Railroad, Ship and Boat Spikes

from 2 to 12 inches in length, and of any form of head

From the excellence of the material always used in

their manufacture, and their very general use for rail-

roads and other purposes in this country, the manu-

facturers have no hesitation in warranting them fully

equal to the best spikes in market, both as to quality

and appearance. All orders addressed to the subscrib-
ers at the works will be promptly executed.

JOHN F. WINSLOW, Agent.

Albany Iron and Nail Works, Troy, N. Y.

The above Spikes may be had at factory prices, of

Erastus Corning & Co Albany; Menitt & Co., New

York; E. Pratt & Brother, Eastmore Md.

**LAP—WELDED
WROUGHT IRON TUBES**

FOR

TUBULAR BOILERS,

FROM ONE AND A QUARTER TO SEVEN

INCHES IN DIAMETER.

THE ONLY Tubes of the same quality and man-
ufacture as those so extensively used in England,
Scotland, France and Germany, for Locomotive, Ma-
rine and other Steam Engine Boilers.

THOMAS PROSSER & SON, Patentees,

28 Platt street, New York.

Railroad Iron.

THE UNDERSIGNED ARE PREPARED TO
contract for the delivery of English Railroad Iron
of favorite brands, during the Spring. They also re-
ceive orders for the importation of Pig, Bar, Sheet, etc.

Iron. **THOMAS B. SANDS & CO.,**

22 South William street,

February 3, 1849.

New York.

Iron Store.

THE Subscribers, having the selling agency of the
following named Rolling Mills, viz: Norristown,
Rough and Ready, Kensington, Triadelphia, Potts-
grove and Thorndale, can supply Railroad Companies,
Merchants and others, at the wholesale mill prices for

bars of all sizes, sheets cut to order as large as 58 in.

diameter; Railroad Iron, domestic and foreign; Loco-

motive tire welded to given size; Chairs and Spikes;

Iron for shafting, locomotive and general machinery

purposes; Cast, Shear, Blister and Spring Steel; Boil-

er rivets; Copper; Pig iron, etc., etc.

MORRIS, JONES & CO.,

Iron Merchants,

Schuylkill 7th and Market Sts., Philadelphia.

August 16, 1849.

ly33

Railroad Iron.

THE MOUNT SAVAGE IRON WORKS, AL-
legany county, Maryland, having recently pass-
ed into the hands of new proprietors, are now prepar-
ed, with increased facilities, to execute orders for any

of the various patterns of Railroad Iron. Communi-
cations addressed to either of the subscribers will have

prompt attention. **J. F. WINSLOW, President**

Troy, N. Y.

ERASTUS CORNING, Albany!

WARREN DELANO, Jr., N. Y.

JOHN M. FORBES, Boston.

ENOCH PRATT, Baltimore, Md.

November 6, 1848.

Railroad Iron.

THE SUBSCRIBERS ARE PREPARED TO
take orders for Railroad Iron to be made at their

Phoenix Iron Works, situated on the Schuylkill Riv-
er, near this city, and at their Safe Harbor Iron Works,

situated in Lancaster County, on the Susquehanna

river; which two establishments are now turning out

upwards of 1800 tons of finished rails per month.

Companies desirous of contracting will be promptly

supplied with rails of any required pattern, and of the

very best quality.

REEVES, BUCK & CO.

45 North Water St. Philadelphia,

March 15, 1849.

Monument Foundry.

A. & W. DENMEAD & SON,
Corner of North and Monument Sts.,—Baltimore.

HAVING THEIR

IRON FOUNDRY AND MACHINE SHOP

In complete operation, are prepared to execute faithfully and promptly, orders for Locomotive or Stationary Steam Engines, Woolen, Cotton, Flour, Rice, Sugar Grist, or Saw Mills, Slide, Hand or Chuck Lathes, Machinery for cutting all kinds of Gearing, Hydraulic, Tobacco and other Presses, Car and Locomotive patent Ring Wheels, warranted, Bridge and Mill Castings of every description, Gas and Water Pipes of all sizes, warranted, Railroad Wheels with best faggotted axle, furnished and fitted up for use, complete.

Being provided with Heavy Lathes for Boring and Turning Screws, Cylinders, etc., we can furnish them of any pitch, length or pattern. Old Machinery Renewed or Repaired—and Estimates for Work in any part of the United States furnished at short notice.

June 8, 1849.

Iron Wire.

REFINED IRON WIRE OF ALL KINDS, Card, Read, Cotton-flyer, Annealed, Broom, Buckle, and Spring Wire. Also all kinds of Round, Flat or Oval Wire, best adapted to various machine purposes, annealed and tempered, straightened and cut any length, manufactured and sold by

ICHABOD WASHBURN.

Worcester, Mass., May 25, 1849.

Wheel, Forge and Foundry Iron.

LOCUST GROVE Wheel Iron of great strength and superior chilling property. Balt. Charcoal Forge Iron, from Patuxent, Curtis Creek and Gunpowder furnaces.

Elkridge Foundry Iron, of superior strength and softness. Anthracite and Charcoal Iron from Pennsylvania and Virginia. Gas and Water Pipes, Lamp Posts from Elkridge furnace.

LEMMON & GLENN,
6m9 62 Buchanan's Wharf, Baltimore.

S. S. Keyser & Co., IRON WAREHOUSE,

Corner of South and Pratt Streets, BALTIMORE, MD.

Selling Agents for the Rough and Ready Bar Iron and Elk Boiler and Flue Iron Rolling Mills, Sarah and Taylor Furnaces, and Wrightsville Hollow Ware Foundry, and Dealers in Bar and Sheet Iron, and Cast, Sheer, German, Blister, Spring and Electroplated Steel, etc., etc.

Smith & Tyson,

GENERAL COMMISSION MERCHANTS,
No. 25 South Charles St., Baltimore, Md.

AGENTS for the Celebrated Columbia Pig Iron, suitable for Car Wheels and Chilled Rolls.

Columbia refined Charcoal Blooms; Refined Charcoal Juniata Billet Iron for Wire; Refined Iron for Bridging, of great strength; Cut Nails, Spikes, and Brads; Railroad Spikes and Wrought Chairs. 22tf

Stickney & Beatty,

DEALERS IN IRON AND IRON MANUFACTURERS.

AGENTS for the Balt. City Rolling Mill, from which establishment they are prepared to furnish Ellicott's round, square, and flat bar iron, puddled and charcoal boiler plates and billet iron—also agents for the sale of the Laurel and Maryland (Balt.) charcoal forge pig irons, Balt. hard iron for chilling wheels, anti-friction nails, Catoctin foundry iron, boiler blooms from the Caledonian works, Wm. Jessop & Son's cast steel, Coleman's blister steel and nail rods, hoop, band, sheet, oval and common English iron.

No. 12 and 20 South Charles St., Baltimore.

Railroad Iron.

CONTRACTS made by the subscribers, agents for the manufacturers, for the delivery of Railway Iron, at any port in the United States, at fixed prices, and of quality tried and approved for many years, on the oldest railways in this country.

RAYMOND & FULLERTON, 45 Cliff St.

Iron.

THE SUBSCRIBERS having resumed the agency of the New-Jersey Iron Company, are prepared to execute orders for the different kinds and sizes of Iron usually made at the works of the company, and offer for sale on advantageous terms.—

150 tons No. 1 Boonton Foundry Pig Iron.

100 " No. 2 do. do. do.

300 " Nos. 2 & 3 Forge do. do.

100 " No. 2 Glendon do. do.

140 " Nos. 2 & 3 Lehigh Crane do do.

100 " No. 1 Pompton Charcoal do.

100 " New-Jersey Blooms

50 " New-Jersey Faggoting Iron, for shafts

Best Bars, $\frac{1}{2}$ to 4 inch by $\frac{1}{2}$ to 1 inch thick.

Do do Rounds and Squares, $\frac{1}{2}$ to 3 inch.

Rounds and Squares, 3-16 to 1 inch.

Half Rounds, $\frac{1}{2}$ to 1 in. Ovals & Half Ovals $\frac{1}{2}$ to $1\frac{1}{2}$ in.

Bands, $\frac{1}{2}$ to 4 inch. Hoops, $\frac{1}{2}$ to 2 inch.

Trunk Hoops, $\frac{1}{2}$ to $1\frac{1}{2}$ in. Horse Shoe & Nut Iron.

Nail Plates, Railroad Spikes.

DUDLEY B. FULLER & Co., 139 Greenwich-st. and 85 Broad-st.

WILLIAM JESSOP & SONS' CELEBRATED CAST-STEEL.

The subscribers have on hand, and are constantly receiving from their manufactory,

PARK WORKS, SHEFFIELD,

Double Refined Cast Steel—square, flat and octagon.

Best warranted Cast Steel—square, flat and octagon.

Best double and single Shear Steel—warranted.

Machinery Steel—round.

Best and 2d gy. Sheet Steel—for saws and other purposes.

German Steel—flat and square, "W. I. & S." "Eagle" and "Goat" stamps.

Genuine "Sykes," L Blister Steel.

Best English Blister Steel, etc., etc., etc.

All of which are offered for sale on the most favorable terms by

WM. JESSOP & SONS,

91 John street, New York.

Also by their Agents—

Curtis & Hand, 47 Commerce street, Philadelphia.

Alex'r Fullerton & Co., 119 Milk street, Boston.

Stickney & Beatty, South Charles street, Baltimore.

May 6, 1848.

JOHNSON, CAMMELL & Co's Celebrated Cast Steel,

AND
ENGINEERING AND MACHINE FILES,

which for quality and adaptation to mechanical uses, have been proved superior to any in the United States. Every description of square, octagon, flat and round cast steel, sheet, shovel and railway spring steel, best double and single shear steel, German steel, flat and square, goat stamps, etc. Saw and file steel, and steel to order for any purposes, manufactured at their Cyclops Steel Works Sheffield.

JOHNSON, CAMMELL & CO.,

100 William St., New York.

November 23 1843.

Railroad Iron.

OF ANY PATTERN AND WEIGHT,

Of a Favorite Brand,

And deliverable in Bond, or Duty paid, at any Port of the U. S., contracted for on favorable terms, by

CHARLES ILLIUS,

20 Beaver St., New York.

Pig and other Iron also contracted for. Sole Agent for "Dexter's Machine and Burning Oil"—particularly adapted for "Railroads" and other Machinery—Preferred to Sperm by the many now using it, and 25 per cent. cheaper.

CUT NAILS OF BEST QUALITY, BAR IRON (including Flat Rails) manufactured and for sale by

FISHER, MORGAN & CO.,

75 N. Water St., Philadelphia.

Ogden & Martin's ROSENDALE CEMENT.

WE are prepared to enter into arrangements for supplying our Cement for public works or other purposes. We warrant the cement equal in every respect to any manufactured in this country. It attains a great degree of hardness, sets immediately under water, and is a superior article for masonry coming in contact with water, or requiring great strength.

For sale in tight barrels, well papered, at their office by

OGDEN & MARTIN, 104 Wall st.

February 16, 1850.

The above cement is used in most of the fortifications building by government.

Railroad Iron.

B. O. Railway Tires, Railway Wheels, Scotch Pig Iron, Tin Plates and Banca Tin, Muntz's Patent Metal Sheathing, Baltimore Copper.

Contracts for Rails made on behalf of the manufacturers, for delivery at any ports in the United States, at fixed prices.

Bowling Tires and Tire Bars and Scotch Pigs imported to order.

Muntz's Ship-sheathing, and a general stock of Tin Plates and Banca Tin in store, and for sale by

RAYMOND & FULLERTON, 45 Cliff st.

Bowling Iron. Stamped B.O.

Railway Tire Bars Rivet Iron
Locomotive and other Axles Locomotive Frame do
Boiler Plates Bars.

and every other description of this superior Iron.

The subscribers, agents for the sale of Bowling Iron, are prepared to execute orders for importation, especially for railway and machinery uses, with despatch from the manufacturers.

RAYMOND & FULLERTON, 45 Cliff st.

Lovegrove's Patent Cast Iron Water and Gas Pipes.

THE Subscriber, the Inventor and Patentee of the

Centrifugal mode of giving form to metallic substances while in a molten state, is preparing to make Cast Iron Water and Gas Pipes, of any dimensions, at prices much lower than they can be made in the old manner, and the pipes warranted to stand a pressure of three hundred pounds to the square inch, and to be soft enough to drill. Steam Engines and all kinds of machinery. Cast Iron Doors and Frames, and Mill Castings of every description, made to order.

THOMAS LOVEGROVE,

Machinist and Founder,

West Falls Avenue, below Pratt st., Baltimore.

Rosendale Cement.

THE NEWARK AND ROSENDALE LIME

AND CEMENT CO. are now manufacturing at their works in NEWARK, N. J., and Ulster county, N. Y., a very superior article of *Hydraulic Cement*—also Lime Calcine Plaster, etc. Contractors and dealers will find it to their advantage to call or make application before purchasing elsewhere. All communications addressed to the subscriber, at Newark, N. J., will be punctually attended to.

1y*15 **HENRY WILDE, Secretary.**

Railroad Instruments.

THEODOLITES, TRANSIT COMPASSES, and Levels, with Fraunhoffer's Munich Glasses, Surveyor's Compasses, Chains, Drawing Instruments, Barometers, etc., all of the best quality and workmanship, for sale at unusually low prices, by

E. & G. W. BLUNT,

No. 179 Water St., cor. Burling Slip.

New York, May 19, 1849.

American Railway Guide, AND POCKET COMPANION FOR THE UNITED STATES;

CONTAINING Correct Tables, showing the time for starting of trains from all stations, distances, fares, etc., on all the Railway lines in the U. States; also many of the principal Steamboat and Stage routes—accompanied by a complete *RAILWAY MAP*. Price, single copies 12 $\frac{1}{2}$ cts., or \$1 per annum. Published on the first of every month, corrected from returns furnished by the Railway Superintendents throughout the Union.

This book has been compiled somewhat on the plan of Bradshaw's Guide, with such improvements in size, form and arrangement as have seemed desirable; and the publisher confidently hopes it will not be found liable to the objections of incompleteness and incorrectness, which have been made, and justly too, against various other similar works heretofore issued.

The subscriber having had the management of the **NEW YORK PATHFINDER** almost from its commencement, has enjoyed superior facilities in obtaining information relating to the thoroughfares of travel, and is therefore well qualified to prosecute with success the arduous undertaking of furnishing a complete and correct national guide book.

STRINGER & TOWNSEND, General Agents, 222 Broadway: and sold also by Booksellers and Periodical Dealers generally throughout the country; also on all the Railways and Steamboats.

CURRAN DINSMORE, Publisher,

N. Y. Pathfinder Office,
139 Fulton St., New York City.

Great American Engineering

AND MECHANICAL WORK, just published in medium folio, 75 cts. to Subscribers, One Dollar to non-subscribers.

Part VI of "Specimens of the Stone, Iron and Timber Bridges, Viaducts, Tunnels, &c. &c. of the United States Railroads." By George Duggan, Architect and Civil Engineer.

The present part contains beautifully executed plans, elevations and sections of the Timber Bridge (three spans of 150, and one span of 160 feet) across the Delaware at Saw Mill Rift, on the line of the N. York & Erie R. R., with the specifications, estimates, bills of timber, iron, etc.

N.B.—With the present (6th) part, are given specimen Plates of the APPENDIX, (or "THEORETICAL AND PRACTICAL TREATISE ON BRIDGE BUILDING, etc. etc.") consisting of plans, elevations, sections and details of a cast iron oblique arch, 130 feet span, across Fairfield st. Manchester, on the line of the Manchester and Birmingham Railroad. Also a specimen sheet of the letter press of the APPENDIX, consisting of an introductory article on the *Application of Iron to Railroad Structures*.

"It is a work that was a great desideratum, and must prove of great benefit to the engineering profession generally, and especially to the tyro in practical engineering and mechanical knowledge; in truth it strikes us, that it would require years of labor and patient toil on the part of a young engineer to prepare the drawings, and collect the information that will be embodied in this work, and can now be secured for the trifling sum of \$9."—[Scientific Amer. March 16, 1850.]

In connection with this subject (Iron Railroad Structures) we take occasion to call attention again to Mr. Duggan's valuable and expensive publication, exhibiting drawings, with full descriptions of the various stone, iron and wooden bridges, viaducts, tunnels, culverts, etc., of all the Railroads in the United States. Mr. Duggan is an accomplished Architect and Civil Engineer, who came from Ireland to this country to exercise his profession; but finding Railroad construction here, in many respects, different from that he had been accustomed to in Europe, he applied himself to the study of our system; and the fruits of his researches and investigations embodied in this work, are well calculated to meet the exigencies of engineers, and to assist draughtsmen, bridge builders, mechanics and students.—[N. Y. Journal of Commerce, Feb. 14, 1850.]

Published by **GEORGE DUGGAN,**
300 Broadway, New York.

To whom all communications should be addressed, and subscriptions forwarded.

FOWLER M. RAY'S Patent India-rubber Railroad CAR SPRING.

New York and Erie Railroad Shops,
Piermont, March 26, 1850.

This will certify that from practical experience in the use of Fowler M. Ray's India rubber Car Springs, I believe them to be far superior to any others now in use.

I have never known them to be affected by any change of temperature, as other Rubber Springs have been affected on this road.

I am at the present time repairing a Passenger Car that Mr. Ray and myself mounted with his springs about two years and eight months since.

The springs are at the present time as perfect, to all appearances, as when first applied to the car.

Respectfully yours,

HORACE B. GARDNER,
Foreman of the Car Shops.

Supt. Office N.Y. & H. R.R., }
New York, March 8, 1850.

This is to certify that we have used the Rubber Springs manufactured by Mr. F. M. Ray for the past twenty months, "both for Passenger and Freight Car Springs and Bumpers, and of different sizes," and have in every case given entire satisfaction, and I consider them the best spring now in use.

M. SLOAT, Supt.

Boston, March 5, 1850.

In answer to your enquiry about India-rubber Springs, I have to say that we have used them to a considerable extent on both freight and passenger cars, and also on several of our tenders; and I am very well satisfied that they answer all the purposes for which they are intended. I believe the India-rubber will soon supersede all other springs for cars and tenders.

Yours truly,

S. M. FELTON,
Supt. Fitchburg Railroad,

Office New Jersey Railroad Co., }
Jersey City, March 8, 1850. }

FOWLER M. RAY, Esq.,

Dear Sir: In answer to your enquiries respecting the operation of the Vulcanised Rubber Springs, purchased by our company from you some two years since, I reply that they are superior to any spring in use, (that I have either seen or heard of).

The improved form of your spring, consisting of a solid piece of vulcanised rubber with bands on the outside, is far superior to your first form, consisting of disks of rubber with metallic plates interposed.

The last named form was tried, if you recollect, at a much earlier period; and then was replaced by your last form.

I have no hesitation in saying that your springs have given entire satisfaction, and most cheerfully recommend them to railroad companies throughout the country for the following reasons:

1st. The cost is 30 per cent. less.

2d. Saving of weight on each car of 8 wheels from 700 to 800 lbs.

3d. Less care and attention is required, as they are not liable to get out of repair.

4th. A great saving is secured in the wear and tear of the cars and rails from their great elasticity.

5th. The freedom from noise.

6th. There is greater safety in case of accident, as they cannot be broken.

7th. The comfort of passengers is enhanced sufficiently to pay the expense, waiving all the other reasons that I have given.

Should this fail to satisfy any person enquiring, you are at liberty to refer to me, No. 150 Washington St., Jersey City.

Yours respectfully,

T. L. SMITH, Supt.

New York, March 11, 1850.

I have used the Patent India-rubber Spring purchased of Mr. Ray, upon the cars of the New York and New Haven Railroad, and have found them efficient and economical; and when applied to the axles and draw springs, believe them to be quite equal to any in use. I have found a combination of these springs with a steel spring under the transom beam a very satisfactory arrangement, and am now using this plan in all new cars.

Yours respectfully,

ROBERT SCHUYLER.

February 25, 1850.

From practical observation of the use of the India-rubber Car Springs, manufactured and sold by your company, we are entirely satisfied in their application, and do not hesitate to recommend them as elastic, durable, requiring no repairs for years, and retaining their consistency during all extremes of weather. We have applied them for the past two years, and consider them superior for all railroad purposes.

Yours truly,

OSGOOD BRADLEY, Car Builder, Worcester.
T. & C. WASON, do. Springfield.
DEAN, PACKARD & MILLS, do. do.
DAVENPORT & BRIDGES, do. Cambridgeport.

Office of the New Jersey Railroad Co., }
Jersey City, March 7, 1850. }

This is to certify that we have had Mr. F. M. Ray's India-rubber Springs in constant use under our cars, and as Bumper Springs for upwards of two years, and they have in every way given perfect satisfaction.

The present form of spring we deem far superior to the form of Disk, having used both forms, although we have none of those made in Disks at present in use.

We take pleasure in recommending these springs to all railroad companies.

J. P. JACKSON, Vice Prest.
New Jersey Railroad and Trans. Co.

Roxbury, February 28, 1850.

In compliance with your request, I take great pleasure in stating the result of my experience in the use of "Ray's Patented Vulcanised India-rubber Car and Engine Springs." We have used them nearly two years, and never had one fail in any way. The cold weather does not affect them, as it has other rubber springs we have used.

With sixteen years' experience as superintendent of machinery on the Boston and Providence railroad, I take pleasure in saying that your springs are the best we ever used, or I ever saw used elsewhere. We have 20 cars rigged with them, of which I can say that the springs are as good now as when first applied. I put 24 lbs. of the rubber under the fore and end of one of our heaviest engines, taking off 250 lbs. of steel springs—it has been in use 18 months, and is in as good condition now as when first put under the engine.

Very respectfully yours,

GEO. S. GRIGGS,
Supt. of Machinery, Boston and Prov. R.R.

Fall River, February 2, 1850.

In answer to yours of the 20th ult. I would say that this company has for some 10 or 12 months past been using "Ray's India-rubber Springs." We have applied them to both passenger and freight cars with uniform success. They have invariably preserved their elasticity and consistency through all the extremes of weather; and we are now applying them wherever the steel spring fails. I am well satisfied that they are particularly adapted for railroad purposes.

Very respectfully yours,

GEO. HAVEN,
Supt. Fall River Railroad.

Jersey City, March 9, 1850.

This is to certify that the present form of Mr. F. M. Ray's India-rubber Car Spring I consider far superior to the form of Disk, having used both forms.

I take pleasure in recommending these springs to all railroad companies.

DAVID H. BAKER,

Foreman of Car Shop of N.J. R.R. & Trans. Co.

Harlem R.R. Depot, }
New York, March 7, 1850.

This is to certify that we have used Mr. F. M. Ray's India-rubber Springs for over eighteen months, and find them to be easy and durable, and recommend them to railroad companies as being superior to anything we have tried.

J. M. SMART,

Foreman at 42d St. Depot.

Old Colony Railroad Office,
Boston, March 6, 1850.

EDWARD CRANE, Esq.,

President New England Car Co.,

Dear Sir: In compliance with your request I would state that the Old Colony Railroad Company have had in use upon their road, India-rubber Springs furnished by your company, for more than eighteen months past, during which time they have been extensively used under Passenger and Freight Cars, Locomotive Tenders, and for Drawer and Buffering Springs, with the most perfect success. The elasticity and consistency of the Rubber has never been unfavorably affected by either extremes of heat or cold—and from the experience which we have had in the use of Rubber Springs, I think them well adapted for railroad purposes—and therefore we have for some months past used Rubber almost exclusively, in all places where springs are required.

Respectfully yours, etc.,

JAS. H. MOORE,
Supt. O. C. Road.

Troy, February 27, 1850.

We have been using your India-rubber Car Springs for nearly two years—and we take pleasure in saying that in our opinion the rubber has to a certain extent already, and may eventually entirely supersede all other Springs for Railroad Car purposes. We now use it entirely for Draw Springs and Bumpers, considering it better and lighter than steel.

During our two years' experience in the use of it, we have not known any to lose their elasticity, or fail in any way; and we cheerfully recommend the rubber for railroad car springs.

Very respectfully,
EATON, GILBERT & CO.

Passenger Car Linings.

THE Advertiser continues to make to order the Enamelled Car Linings which have been so highly approved the last three years, and are now exclusively used by all the Northern Railroads. No pains are spared to get out new styles, and adapt them to the tastes of every consumer.

Orders addressed to **CHARLES STODDER,** No. 75 Kilby street, Boston, will have prompt attention.

March 23, 1850.

2m

India-rubber for Railroad Cos.

RUBBER SPRINGS—Bearing and Buffer—Fowler's Patent—Hose from 1 to 12 inches diameter. Suction Hose. Steam Packing—from 1-16 to 2 in. thick. Rubber and Gutta Percha Bands. These articles are all warranted to give satisfaction, made under Tyer & Helm's patent, issued January, 1849.—No lead used in the composition. Will stand much higher heat than that called "Goodyear's" and is in all respects better than any in use. Proprietors of railroads do not be overcharged by pretenders.

HORACE H. DAY,

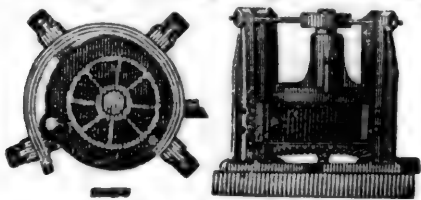
Warehouse 23 Courtlandt street,
New York, May 21, 1849.

Spikes, Spikes, Spikes.

ANY person wishing a simple and effective Spike Machine, or a number of them, may be supplied by addressing
J. W. FLACK,
March 6, 1850.
Troy, N.Y.

MACHINERY.

Henry Burden's Patent Revolving Shingling Machine.



THE Subscriber having recently purchased the right of this machine for the United States, now offers to make transfers of the right to run said machine, or sell to those who may be desirous to purchase the right for one or more of the States.

This machine is now in successful operation in ten or twelve iron works in and about the vicinity of Pittsburgh, also at Phoenixville and Reading, Pa., Covington Iron Works, Md., Troy Rolling Mills, and Troy Iron and Nail Factory, Troy, N. Y., where it has given universal satisfaction.

Its advantages over the ordinary Forge Hammer are numerous: considerable saving in first cost; saving in power; the entire saving of shingler's, or hammerman's wages, as no attendance whatever is necessary, it being entirely self-acting; saving in time from the quantity of work done, as one machine is capable of working the iron from sixty puddling furnaces; saving of waste, as nothing but the scoria is thrown off, and that most effectually; saving of staffs, as none are used or required. The time required to furnish a bloom being only about six seconds, the scoria has no time to set, consequently is got rid of much easier than when allowed to congeal as under the hammer. The iron being discharged from the machine so hot, rolls better and is much easier on the rollers and machinery. The bars roll sounder, and are much better finished. The subscriber feels confident that persons who will examine for themselves the machinery in operation, will find it possesses more advantages than have been enumerated. For further particulars address the subscriber at Troy, N. Y. P. A. BURDEN.

Railroad Spikes and Wrought Iron Fastenings.

THE TROY IRON AND NAIL FACTORY, exclusive owner of all Henry Burden's Patented Machinery for making Spikes, have facilities for manufacturing large quantities upon short notice, and of a quality unsurpassed.

Wrought Iron Chairs, Clamps, Keys and Bolts for Railroad fastenings, also made to order. A full assortment of Ship and Boat Spikes always on hand.

All orders addressed to the Agent at the Factory will receive immediate attention.

P. A. BURDEN, Agent,
Troy Iron and Nail Factory, Troy, N. Y.

CHILLED RAILROAD WHEELS.—THE UNDERSIGNED are now prepared to manufacture their Improved Corrugated Car Wheels, or Wheels with any form of spokes or discs, by a new process which prevents all strain on the metal, such as is produced in all other chilled wheels, by the manner of casting and cooling. By this new method of manufacture, the hubs of all kinds of wheels may be made whole—that is, without dividing them into sections—thus rendering the expense of banding unnecessary; and the wheels subjected to this process will be much stronger than those of the same size and weight, when made in the ordinary way.

A. WHITNEY & SON,
Willow St., below 13th,
Philadelphia, Pa.

Brown's Old Established SCALE WARE HOUSE,

NO. 234 WATER ST., NEW YORK.

THE Subscriber, Practical Manufacturer of Scales of every description, respectfully asks the attention of Railroad Companies to his Improved Wrought Iron Railroad Track and Depot Scales which for strength, durability, accuracy, convenience in weighing, and beauty of workmanship, are not surpassed by any others in this country.

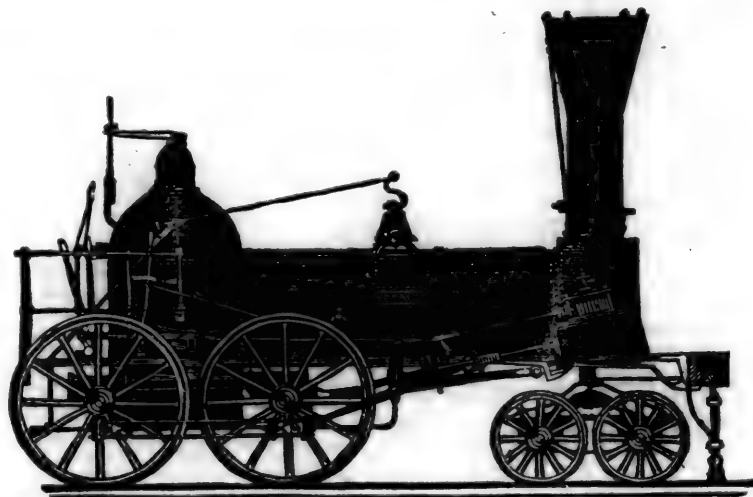
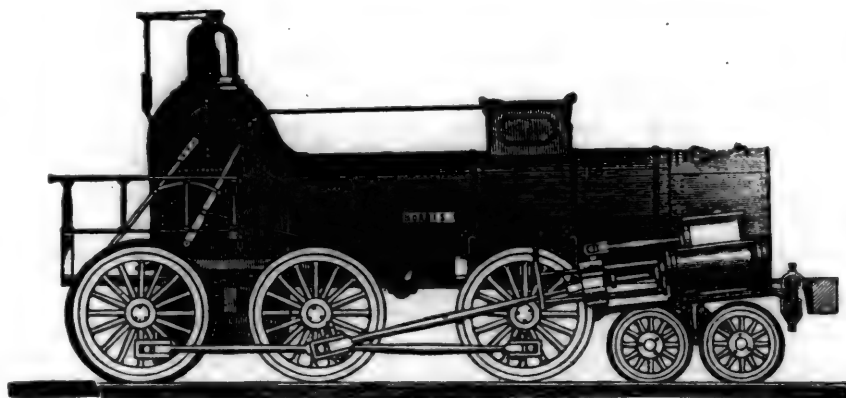
He is aware that this is rather a bold assertion for him to make, yet he can say with confidence that they have but to be tried to give them precedence over all others.

J. L. BROWN.

Dr Bank Scales made to order, and all Scales of his make Warranted in every particular.

References given if required.

41f

NORRIS' LOCOMOTIVE WORKS.
BUSHHILL, SCHUYLKILL SIXTH-ST., PHILADELPHIA,

THE UNDERSIGNED Manufacture to order Locomotive Steam Engines of any plan or size. Their shops being enlarged, and their arrangements considerably extended to facilitate the speedy execution of work in this branch, they can offer to Railway Companies unusual advantages for prompt delivery of Machinery of superior workmanship and finish.

Connected with the Locomotive business, they are also prepared to furnish, at short notice, Chilled Wheels for Cars of superior quality.

Wrought Iron Tyres made of any required size—the exact diameter of the Wheel Centre, being given, the Tyres are made to fit on same without the necessity of turning out inside.

Iron and Brass castings, Axles, etc., fitted up complete with Trucks or otherwise.

NORRIS, BROTHERS

PATENT MACHINE MADE HORSE-SHOES.



The Troy Iron and Nail Factory have always on hand a general assortment of Horse Shoes, made from Refined American Iron.

Four sizes being made, it will be well for those ordering to remember that the size of the shoe increases as the numbers—No. 1 being the smallest.

P. A. BURDEN, Agent,
Troy Iron and Nail Factory, Troy, N. Y.

Etna Safety Fuse.

THIS superior article for igniting the charge in wet or dry blasting, made with DUPONT'S best powder, is kept for sale at the office and depot of

REYNOLDS & BROTHER,

Sole Manufacturers, 41

No. 85 Liberty St.

NEW YORK.

And in the principal cities and towns in the U. States. The Premium of the AMERICAN INSTITUTE was awarded to the Etna Safety Fuse at the late Fair held in this city.

November 3, 1849.

1y

COLUMBUS, OHIO,
Railroad Car Manufactory.
RIDGWAYS & KIMBALL,

HAVE established at this central point, the manufacture of Passenger, Freight, Gravel and Hand Cars for Railroads, and assure all Western Railroad Companies that it will be their constant aim to procure the best materials and workmen, and to turn out the best kind of work at fair prices. Specimens may be seen on the Columbus and Xenia Railroad. The patronage of Railroad Companies is respectfully solicited.

1y8

To Inventors and Patentees.

OWEN G. WARREN, ARCHITECT, Has had many years' experience as Agent for obtaining Patents, both in this country and Europe, and will transact such business promptly and reasonably. Persons at a distance can have their business done by correspondence—without the necessity of visiting this city or Washington. Office No. 94 Merchants Exchange, Wall st., corner of Hanover st., up stairs.

1y3

AMERICAN RAILROAD JOURNAL.

STEAM NAVIGATION, COMMERCE, MINING, MANUFACTURES.

HENRY V. POOR, Editor.

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J. T. HODGE, *For Mining and Metallurgy.*
GEN. CHAS. T. JAMES, *For Manufactures and the Mechanic Arts.*
M. BUTT HEWSON, C. E., *For Civil Engineering.*

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American Railroad Journal.

PUBLISHED BY J. H. SCHULTZ & CO., 136 NASSAU ST.

Saturday, August 3, 1850.

Statistics of Iron Manufacture in Penn.

Below will be found the Appendix to the Report of the Committee on Statistics, appointed at the Iron Maker's Convention held in Philadelphia on the 7th of December, 1849. We invite to it particular attention as presenting a full view of the condition and prospects of the iron trade of that State. The statements there submitted to the public are a simple narration of facts from actual examination, upon which each person can make his own comments.

Since the adjournment of the Convention and the publication of the first report of the Committee on "Statistics and the State of the Trade," I have made a tour through the State, visiting in person, or obtaining authentic information from each of the Iron Works in the State. The facts thus collected are contained in a condensed form in the following fifteen tabular statements. The first eight of which comprise all the works in the State east of the Alleghany mountains, and the last seven those west of that mountain. The result shown by the tables may be briefly summed up as follows:

the total number of counties in the State is.....62
Of these the number now containing iron works is.....45

The number containing no iron works.....17
Of these 17 counties, however, 9 contain abundance of iron ore and coal, but owing to the absence of any cheap road to market, they yet remain untouched, leaving only 8 counties of 63 in the State not suited to the manufacture of iron.

Production of Iron from the Ore.—The following table shows the number of furnaces of each sort and of bloomeries in the State. The capital invested in land, buildings and machinery. Their present capacity. The actual make in 1847, 1849, and the probable make of 1850, respectively.

	Blast furnaces using	No.	Investm't. capacity.	Present Tons.	Make 1847. Tons.	Make 1849. Tons.	Make 1850. Tons.
Anthracite coal..	57	\$3,291,000	231,400	151,331	109,168	81,351	3,900
Bituminous coal.	7	233,000	12,600	7,800	4,900	3,900	3,900
Coke.....	4	800,000	12,000	10,000	58,302	42,556	42,556
Charcoal hot blast	85	6,478,500	130,705	94,519	58,302	42,556	42,556
" cold	145	5,170,376	173,654	125,155	80,665	70,727	70,727
Bloomeries.....	6	28,700	600	545	336	280	280
Totals.....	304	12,921,576	550,950	389,350	253,370	198,813	198,813

Of the 298 furnaces in the State, 149, or exactly half, are in blast this year—and of this number about one-third are making no preparations to blow during next year.

The make of 1850 cannot exceed the amount above stated for this year, and will probably not equal it. It is estimated simply by deducting from the make of 1849 the amount produced by such furnaces as were at work last year and are now idle.

The estimate allows nothing for any diminution consequent on the further decline in the price of iron

which has taken place since the date of my visit, nor for stoppages and failures.

Fifteen furnaces were sold by the sheriff in the first four months of this year, and other sales under execution, will probably reduce the make below the amount above stated. A comparison of the make of 1850 with that of 1847 shows a decrease of 190,537 tons, or 49 per cent. in three years. If the present state of things continues, the make of 1851 will not exceed 100,000 tons.

Conversion of Cast into Wrought Iron.—The following table shows the number of forges and rolling mills in the State. The investment in lands, buildings and machinery. The total number of converting fires and their capacity per annum, and their make in 1847 and 1849.

	Charcoal forges	No. works.	Investm't.	No. forge fires.	No. of pud-dling fur.	Capa-city. Tons.	Actual make 1847. Tons.	Actual make 1849. Tons.	Actual make 1850. Tons.
Rolling mills..	121	2,026,300	402	436	174,400	50,280	39,997	28,495	28,495
Totals.....	79	5,554,200	402	436	174,400	163,760	108,358	108,358	108,358

* 402 fires at 125 tons per fire per annum.
† 436 furnaces at 400 tons per furnace per annum.

The make of 1849 shows a falling off from that of 1847 of 66,874 tons, or 33 per cent.

In Eastern Pennsylvania, the manufacture of all descriptions of iron that come in competition with the English is extinct. All the markets accessible from the sea or the lakes being entirely supplied with the foreign article.

A small amount of railroad iron is still made for the interior, but this branch of manufacture shows the following decline:

Present annual capacity of the State...64,400 tons.
 Make 1847.....40,966
 Make 1849.....18,973

Decrease in two years 21,993 tons, or 54 per cent.

The make of 1850 will show a still greater falling off—but it cannot be accurately estimated, as the mills run or stop as they succeed or fail in obtaining contracts for their iron. Of the six rail mills in the State, two are stopped entirely, and the remaining four are not averaging half time.

The other rolling mills now running are sustained almost entirely by the manufacture of boiler plates and cut nails, which are less seriously affected by foreign competition, though the prices and the demand have been much reduced by it. The English cannot make, at any price, boiler plates equal to our best charcoal plates, but they now furnish all the inferior ones, as well as all the flue and sheet iron now sold.

Cut nails are exclusively of American invention and manufacture, and they have never been imported.*

The total number of nail machines in the State is 606. The annual productions of each machine averages 1000 kegs of 100 lbs. each, making 606,000 kegs, or 30,300 tons a year. Of the product of the forges two thirds are sold in the form of blooms to the rolling mills, and are manufactured into boiler plates, horse shoe rods, and bars for the manufacture of sythes, axes, edge tools and cutlery, and other articles requiring a high polish. The remaining one third is sold in the form of hammered bar iron in competition with Swedish and Russian iron.

The Conversion of Iron into Steel.—The following is a list of all the works in the State engaged in the conversion of steel:

County.	Situation of Works.	Owners.	Amount annually converted. Tons.
Philadelphia.	Kensington.	Jas. Rowland & Co.	600
"	"	J. Robbins.	500
"	"	Earp & Brink.	100
"	"	Robt. S. Johnson.	400
"	"	W. & H. Rowland.	400
"	"	Martie, R. & G. D. Coleman.	400
"	"	R. W. & W. Coleman.	100
"	"	Singer, Hartman & Co.	700
"	"	Coleman, Hallman & Co.	800
"	"	Jones & Quigg.	1,200
"	"	Spang & Co.	200
"	"	G. & J. H. Schoenberger.	200
"	"	S. McKelvy.*	178
Total tons.....			6,078

The total number of iron works of all kinds in the State is 504. The capital invested in lands, buildings and machinery, \$20,502,076. The number of men employed, 30,103. Number of horses employed, 13,562.

The capital invested includes only such land and

* The price of cut nails has steadily declined in consequence of improvements in the method of manufacture and of domestic competition, from 6 cents per pound in 1839, to 3½ cents, the present rate. It cannot be reasonably doubted that a similar result must follow the permanent establishment of other branches of the iron manufacture, and hence the fallaciousness of those arguments against initial protection, which are founded upon the assumption of a perpetual tax upon consumers.

buildings as belong to the iron master, and such as are directly dependent on the iron works for their value.

Thus the value of farms, grist and saw mills, and similar property, horses, wagons, tools and the like, and the dwellings of workmen near large cities, are excluded, though belonging to the works, because they have an independent value.

The value of all coal land has been also excluded, both for the reason just given, and because it is the custom throughout the State, with but very few exceptions, to purchase coal delivered at the works. The capital, and men, and horses employed in mining and transporting this coal to the works, and in transporting the finished iron to market, have also been excluded from the above account, because sufficient data were not in my possession for more than a conjectural estimate.

More than one half of the anthracite furnaces, and a portion of the charcoal furnaces purchase their ore of the farmers in their vicinity, who dig it on their farms and haul it to the furnaces in the winter, and at other times when they are not more particularly occupied with their agricultural labors. There are other large and valuable ore banks in the State which belong to parties who work them and sell the ore to furnaces in their vicinity. The value of all these ore banks and the number of laborers employed at them, are excluded from the above account, which comprises only such real estate as belong to persons in the iron business, and is indispensably requisite to carry on such business—and the number of men and horses directly employed by them.

The number of men thus engaged, over and above those reported to me as in the pay of the iron manufacturers, may be very nearly approximated by reference to tables A and B, pages 89 and 91 in the communication of S. J. Reeves, Esq., on the elementary cost of making pig and bar iron. On the basis of these tables I have calculated the number of laborers not in the pay of the iron masters, but directly dependant on the iron works for support, to be 7,081 for the blast furnaces, and 4,432 for the rolling mills, forges, etc.: making together 11,513 to be added to the number above stated, or a grand total of 41,616 men dependant on the iron business in the State. Allowing five persons to each laborer, we have a population of 208,080 persons, or about one tenth of the entire population of the State dependant on the manufacture of iron.

The consumption of fuel in all the iron works of the State in 1847 was as follows:

Anthracite coal, 483,000 tons, at an average value of \$3 per ton.....\$1,449,000
 Bituminous coal, 9,007,600 bushels, at 5.....450,380
 Wood, 1,490,252 cords, at \$2*.....2,980,504
 \$4,879,884

Both wood and coal are so abundant in the State that they have scarcely any value beyond the cost of the labor of getting them to market, and the amount sent to market is only limited by the demand. So that it cannot be said that to the owner of the wood or coal, it is a mere question as between buyers, for if the iron works stop, the demand and consequent production of fuel is curtailed proportionably. The wood has no value at all except for the iron works, as it is too bulky to bear transportation to any market; and in neighbor-

* This value is intended to include the cost of converting into charcoal [the form in which it is generally consumed] and delivering at the furnace. It would be equivalent to five cents a bushel as the average value of charcoal.

hoods where there are no iron works, from \$10 to \$15 per acre is paid to clear and burn it off the land.

Any one not familiar with the topography of the State would suppose that the enormous consumption of one and a half millions of cords of wood per annum would necessarily be of short continuance, owing to a failure of the supply. But it certainly does not exceed one fourth the ability of the State to furnish annually, for ever. The Alleghany mountains divided into six or seven parallel ranges cross the State diagonally from northeast to southwest. The higher portions of which ranges are too stony and steep for cultivation, but support a luxuriant growth of timber, which if cut down reproduces itself of sufficient size for the purpose of iron making, once in twenty years. Much the larger portion of these ranges has not yet been cut over the first time.

The following statement of the iron works now running, or in running order, shows the number of each kind built in each period of 10 years previous to 1840, and in each year since that date. Also the number of failures in each of the last ten years:

	Blast fur.		Bloomeries		Total of all kinds.	
	Mineral coal.		Charcoal.		forges and rolling mills.	
	Built S. F.*	Built S. F.*	Built S. F.*	Built S. F.*	Built S. F.*	Built S. F.*
Ten years ending						
January 1st.....1730	1	1	1	1	1	1
1740	1	1	1	1	1	1
1750	2	1	1	1	3	3
1760	2	5	5	7	7	7
1770	3	2	2	5	5	5
1780	1	4	4	5	5	5
1790	9	16	16	25	25	25
1800	11	19	19	30	30	30
1810	14	16	16	30	30	30
1820	1	18	18	30	30	30
1830	5	72	46	123	123	123
1840	3	3	3	6	3	6
During the year..1840	1	3	1	2	1	6
1841	5	8	8	7	10	20
1842	1	5	4	2	2	7
1843	4	13	2	4	3	21
1844	14	15	2	11	1	40
1845	11	30	3	12	53	4
1846	8	12	5	8	25	24
1847	5	6	20	6	12	17
1848	3	5	30	5	6	10
1849	3	15	4	7	7	23
Four months in..1850	5	1	1	6	6	6
Now unfinished.....	68	21	330	103	206	53
Totals.....	68	21	330	103	206	53

* Sold by sheriff or failed since January, 1840.

That portion of the preceding table which relates to the period prior to 1840 is of historical interest only. It shows a very regular increase in the number of works. The course of affairs for the last ten years is very clearly indicated by the table.

The great impetus given to the business about the year 1840, may be attributed to the discovery two years before, of the value of anthracite coal for iron making purposes. The lower clauses of the compromise tariff act coming into operation in '42, and the passage of a new tariff act in that year together, produce the curious result of 20 new works built and 20 failures. The number of new works then steadily increases, and the number of failures as steadily decreases, until they stand in 1846—53 new works built to 4 failures. But in that year the tariff of 1842 was repealed, and the present ad valorem duty laid on the price of foreign iron, which was then excessively inflated by the railway fever

in England, and in the next year (1846) we have the number of new works and the number of failures again even, 25 to 24, as in 1842, but with this important difference, that in 1842 distress was decreasing, whereas the difficulties of 1847 were only the beginning of more serious troubles. This is shown by the regularly diminishing number of new works, and the as regularly increasing number of failures, until we have for 1849 the new works only 10 to 41 failures.

The result has been asserted to be entirely the effect of over trading, and to be in no respect attributable to the tariff of '46, but it will be seen by reference to the extract from Mr. Walker's report, on page 36, that at the very time when we were making the most iron, we were importing annually an average of 50,000 tons of pig and bar iron alone, exclusive of all chains, wrought iron, hardware, cutlery, steel, etc. A business cannot be said to be overdone, which is inadequate to the supply of the home market.

It may be well to note one other fact shown by the preceding statement. The year 1847 was that in which the largest amount of iron was produced, and also the first of the present series of disastrous years.

It is the custom with the manufacturers of charcoal iron to make their contracts in the winter for all the materials required during the year. The prices of these materials is governed by the selling price of iron at that time, but the greater part of a year elapses before the iron is made and brought to market.

By reference to page 37 it will be seen that the price of Scotch pig in Glasgow in
January, 1847, was.....£3 13 4
January, 1848, it was.....2 8 4
Decrease in price.....£1 5 0
Freights in January, 1847, were..12s. 6d.
" " 1848, were..15s. 0d.

Difference.....2 6
Add decrease in duty 30 per ct. ad valorem.....£1 2 6
7 6

Total decrease in price of iron in the U.S. £1 10 0
Or in dollars, \$7 33.

Makers of small capital having contracted for their materials at the high prices ruling in the beginning of the year, and being obliged to sell at the low ones prevailing toward the close of it, were reduced to bankruptcy.

It will be seen by reference to the statement that two thirds of the failures in the year were among the makers of charcoal pig iron.

Many other interesting deductions might be made from the tables, but the object of this brief introduction is only to point out a few of the more striking results. Leaving to abler hands a more careful analysis, they are respectfully submitted.

CHARLES E. SMITH,
Chairman Committee on Statistics.

Coal Trade.

The quantity sent by railroad this week is 12,401-15—by canal none.

The great freshet, by which the different avenues to market from the coal regions have sustained so much injury, has placed the trade in such a dilemma that our duty to the public calls for some statement with regard to its present situation and future prospects. Our candid impression is that the different coal regions cannot supply the demand for the balance of the season, and that coal must materially advance in price. We base our calculations on the following data, which those engaged in the trade can examine, and judge for themselves.

The extraordinary and ordinary increase required to supply the market this year, will be as follows—

Increase in the California trade—extra.....	Tons. 100,000
Increase caused by the low prices this year and the check in consumption in the early part of last year, by advance in prices—extra.....	50,000
The ordinary increase last year over the former year was 250,000 tons, at advanced prices a portion of the year—there is no reason that it should be less this year—therefore, say.....	250,000

Increase required for 1850.....400,000

The coal market was barer of coal at the opening of spring navigation this year, than it has been for the last three years, and the overstock was less by at least 100,000 tons, leaving but a small supply in the market unconsumed—barely sufficient to supply the different points for consumption, until the spring supplies arrived, except, perhaps in Boston.

The quantity sent to market this year, from the Schuylkill and Lehigh regions, is as follows: The Delaware and Hudson canal company have made no publication of their shipments this year, and the general impression is, that from difficulties which have occurred in the navigation of their enlarged canal, the supply does not exceed, if it does not fall short of the supply to the same period last year.

	1849.	1850.
Schuylkill—railroad.....	603,115	636,646
canal.....	183,916	264,226
	787,031	900,872
Lehigh.....	316,975	409,578
	1,104,006	1,310,450
		1,104,006

Increase in the supply in 1850—tons. 206,444

All this increase will be more than absorbed, by the recent freshet, which will obstruct the trade for several weeks. The weekly shipments amount in the aggregate, from the three principal regions, to about 95,000 tons, which for three weeks would amount in the aggregate to 285,000 tons loss. The Susquehannah trade and smaller regions have not increased over last year's supply so far, and as the trade in those sections is obstructed from the same causes, the deficiency will nearly, if not quite, balance the supply that will be sent to market from Schuylkill county by railroad for the ensuing three weeks. Many of our collieries below the water level, are "drowned out," as we term it here, and some will not be cleared of water under two weeks.

The quantity of coal sent to market last year from the Lehigh, from July 21st to the close of the season, December 10th, was 513,421 tons, which divided into 10 weeks, is 51,342 tons per week.—They may ship up to December 10th again this fall, but the chances are as five to one that they will close at least two weeks earlier, and consequently under no circumstances can the supply from that quarter be increased, after they resume again, more than 50,000 tons, and there may be not one single ton of increase.

The Schuylkill region sent to market, from the present period to the 14th December, in 1849, 909,400 tons, which divided into 20 weeks, gives within a fraction of 45,000 tons per week. When the canal is in full operation again, we cannot average more than 50,000 tons per week from this region, up to the close of the Schuylkill Navigation, which

may take place at least two weeks earlier, and consequently reduce the quantity. The great depression which has characterised the trade this season, the stoppage of many collieries, and the time required to prepare them for work again, together with the great reduction of the working forces of the region, induces many of our operators to incline to the opinion that no increase can take place for the balance of the season, but we put it down at 100,000 tons, which it cannot exceed, and may be reduced to one half in quantity, should any further interruption take place, or the time required for repairs extend beyond three weeks.

The Delaware and Hudson canal company, from the damages sustained by filling up the mines, etc., will not be likely to increase their quantity much, if any, this year over last year's supply; they may fall short—but admit that they can increase 50,000 tons, and the following will be the probable situation of the market:

	Tons.
Increase required in 1850.....	400,000
Possible increased supply from—	
Lehigh.....	50,000
Schuylkill.....	100,000
Lackawana.....	50,000
	200,000

Deficiency in 1850.....200,000

There never can be less overstock in so extended a market as we have for coal, as there was at the opening of navigation this spring. If properly distributed, we doubt whether there were over two weeks' consumption in the market.—*Pottsville, Journal.*

For the American Railroad Journal.

Documents Relating to the Manufacture of Iron in Pennsylvania.

Published on behalf of the Convention of Iron Masters, which met in Philadelphia on the 20th of December, 1849.

Continued from page 470.

Having thus briefly adverted to the general views which have guided the convention, our remaining space will be given to a few of the most remarkable statements of the documents. The most impressive to a Pennsylvanian is the rapid growth of the manufacture of iron in this country; which is asserted to have reached, at the commencement of the existing depression, an amount "equal to that of England 15 years ago, (800,000 tons in 1834). It is a source of just pride, as well as of hope, that contending against the immense resources of the British works, the steadiness of their running, and their accumulation of skill and confidence under a long continued patronage of the government, our manufacturers have been able to reach so advanced a stage, and that with so powerful adversaries, and in the midst of unexampled misfortunes, they ask no aid except against artificial irregularities, produced by special foreign efforts against them, or by fluctuations in the British supply not resulting from the normal course of trade.

For the purpose of contrasting the limited encouragement thus asked, with the protection under which the British works have attained their actual condition, the Committee on Statistics have compiled a summary of British legislation from the year 1679 to 1826; during which long period of one hundred and forty-seven years, we find "an unwavering protection, always under specific duties, and always increasing in amount until they were no longer needed." Accompanying these duties in the summary, we find, in addition to the prohibitory character of some of the imposts, a series of

grave penalties upon the exportation of workmen and tools; and a list of brilliant inventions carefully guarded in their application, and restricted in their first and most encouraging effect to British works.

Accompanying the report of the same committee are fifteen elaborate tables, the great value of which will be at once recognized. They were prepared by the able chairman of the committee,* during a visit and inspection by him of all the works in Pennsylvania. They exhibit the number and condition of each kind of iron works in the year 1850, distinguishing anthracite, raw bituminous, coke, and charcoal furnaces, bloomeries and forges in general, and rolling mills, showing respectively the date of construction—name of the works—the post office—names of owners and lessees; the number in and out of blast—the number sold by the Sheriff or failed since 1840—the amount of investment in each—the largest product—the actual make in 1849—the annual capacity—the number of men, boys, oxen, horses and mules employed—the dimensions of stack—number and dimensions of twer—heat and pressure of blast—kind of power used—kind of metal made—form in which the iron leaves the works and the market for sales; for the bloomeries and rolling mills we have further the number of blooming fires and hammers—number of puddling and heating furnaces—trains of rolls and nail machines, and the quantity and kind of materials used, etc., etc. These details are separately arranged with reference to Eastern and Western Pennsylvania; a distinct place in the tables being given to the particulars of each of the works in each of the 45 counties in which there are manufacturing of iron.

Of the remaining seventeen counties, nine "contain abundance of iron ore and coal, but owing to the absence of any cheap road to market, they yet remain untouched, leaving only eight counties of sixty-two in the State, not suited to the manufacture of iron."

The number of furnaces of each kind, and of bloomeries is stated at 304; the present capacity of which is 550,959 tons. The investment \$12,921,576.

The number of forges is 121, with a capacity of 50,250 tons, and an investment of \$2,026,300.

The number of rolling mills 79, with a capacity of 174,400 tons, and an investment of \$5,554,200. The present annual capacity of the State for rails is given at 64,400 tons.

The number of works for the conversion of iron into steel is 13; the amount annually converted being reported at 6,078 tons.

The total number of nail machines is 606, averaging 30,300 tons a year.

The aggregate value of these works must astonish those of our fellow citizens, whose attention had not been given to the importance of the iron manufacture to our State.

Total number of works of all kinds....	504
Capital invested in lands, buildings and machinery.....	\$20,502,076
Number of men employed.....	30,103
" " horses.....	13,562

It is to be noticed that under the head of capital, are included only such lands and buildings as belong to the iron master, and are directly dependant on the iron works for their value. It does not in-

* Mr. Charles E. Smith, whose well known practical skill, aided by personal inspection of the principal works of Great Britain and continental Europe, as well as of those in the United States, had peculiarly qualified him for this duty.

clude farms, grist and saw mills, horses, wagons nor tools, nor the dwellings of workmen in large cities; nor coal land, nor the capital and men employed in running and transporting coal to the works, nor in transporting the finished iron to market; nor the value of ore banks not belonging to the iron master, nor the working of such banks.—Hence, vast as is the amount stated, much remains to be added before we can form an adequate conception of the extent of property and labor involved in the manufacture. Take for example the single item of fuel:

Anthracite coal, 483,000 tons—average value \$3.....	\$1,449,000
Bituminous coal, 9,007,600 bushels at 5 cents.....	450,380
Wood, 1,490,252 cords at \$2 (in coal).....	2,980,504
	<hr/> \$4,879,884

making nearly five millions of dollars annually, as estimated from the consumption of 1847.

It cannot be otherwise than interesting to trace the relation of so extensive a department of industry to the agricultural and other productive classes of our people. Forming, as this does, an important part of the history of our social progress, it claims the attention of the inquirer, irrespectively of its bearing upon the revenue system, and it is only with reference to its most general aspects that we advert to it here. Whatever may be thought of the particular estimates of the "documents," no reader can fail to perceive that the contributions of the iron manufacture to the encouragement of agriculture have been greatly undervalued in the popular mind. It is not difficult to obtain a closely approximate average of the consumption of persons engaged in that manufacture, and of the number of such persons. Mr. Smith, whose personal inquiries at each of the works give to his calculations the value of direct competent testimony, calculates that there are about 41,600 men directly dependant upon the iron works of the State; that is, about 11,500 in addition to the 30,000 who are in the actual pay of the iron masters. If we concede to him his allowance of five persons to each laborer, we have more than 200,000 persons, or about one-tenth of the entire population of the State dependent upon the manufacturer of iron, but even after any reduction which can be reasonably made from this allowance, the number of mouths to be fed must bear a large proportion to that of the whole people of Pennsylvania.

In a communication from Mr. Samuel J. Reeves, a gentleman at the head of one of the largest establishments in the country, it is stated that the number of people supported by the iron business in the whole country is about 600,000; and to these he allows a consumption of land products to the amount of \$50 per head per annum, equal to a total of 30 millions of dollars annually. We can fully appreciate the greatness of this result, when we have compared it with the amount of our exports. By the Register's tables for the last fiscal year reported [ending June 30th, 1849] it appears that the total value of exports to England, Scotland and Ireland, of flour, Indian corn and Indian meal, was only \$12,848,308, and that the total vegetable food for the United States to all parts of the world was only \$25,642,362. The exports of all products whatever directly or indirectly from agriculture, [exclusive of tobacco, cotton and sugar] including pork, beef, etc., to every part of the world, amounted to only \$38,824,787.

We have not space to continue this view of the subject. The reader will easily recall other topics,

such as the enlargement of domestic traffic; the increase-value given to property, the augmentation of state revenues from taxes, and of tolls upon internal improvements. It is aside from our purpose to consider the effect upon our currency and exchanges produced by importations from abroad, especially from countries to which our agriculture cannot contribute all the means of payment, and to which we must transfer specie, or government or corporate securities. This and other connected topics may be better discussed in their relations to the tariff policy of the country. It ought not, however, to be omitted, that the limitation put upon our exports of breadstuffs to Great Britain is much below the demand which the iron used by us makes upon agriculture. Many articles for which the former seeks a market, do not admit of exportation; but they meet with a constant consumption among iron workers at home; and the kind of demand thus occasioned is so far independent of the principal articles exported, as to interfere little, if at all, with the probable further shipments of breadstuffs.

A more restricted, yet very effective mode of exhibiting the dependence of the farming classes, is used by Mr. Reeves, who adds an estimate for some other interests. Taking about fifteen millions of dollars as the value of imports of iron from Great Britain for the last reported fiscal year, it is estimated that there were consumed in the manufacture in Great Britain—

Coal, 1,412,649 tons—Iron ore, 1,053,739 tons—Limestone, 411,706.

The labor, at the rate adopted for the calculation, would amount to about eleven millions of dollars. The number of workmen is put at 56,471; and if these are allowed only \$30 each per annum, the total of farmer's products imported in the form of iron for the last fiscal year is estimated at more than eight millions of dollars; if rated at the American allowance, the value thus calculated would amount to more than fourteen million of dollars.—It will be observed that the value of the coal, ore, and limestone may be considered as created by their use in this manufacture; without which they must have remained unconsumed for an inadequate time.

Mr. Smith reports that of the 298 furnaces in Pennsylvania, 149 or exactly one-half are in blast this year,* and that of this number about one-third are making no preparations to blow during the next year; that in Eastern Pennsylvania, the manufacture of all descriptions of iron which came in competition with the English, is extinct; that a small amount of railroad iron is still made for the interior (as must be the case even for a time after it has ceased to repay cost;) but that this branch shows a decline of 54 per cent in two years; and that of the six rail mills in the State, two are stopped entirely—and the remaining four are not averaging half time; that during the first four months of this year fifteen furnaces were sold by the Sheriff, and other sales under execution were expected; and that, judging by the present state of affairs, the make of 1850 will not exceed 100,000 tons.

It is melancholy to witness this decline of so vast a system of industry, holding relations so important with the leading interest of the country. Whether this is to be attributed to causes within the control of the parties primarily concerned in the establishment of that system, or to others properly within the sphere of legislation, must be determined.

* From this number must now be taken five furnaces which have recently blown out.

ed by each individual, according to his economical views. We had designed to abstract some statements of the cost of manufacturing pig and bar iron in the United States and in Great Britain, but we have already exceeded our intended limits of space. P.

Philadelphia, July 20, 1850.

Life of Richard Trevithick, C. E.

BY HYDE CLARKE, ESQ.
Continued from page 475.

About 1806, an attempt was made by Trevithick to introduce his patent engine, as a simple non-condensing high pressure engine, for pumping and winding in the mining districts, in place of the condensing engine of Boulton and Watt.* He considered that the use of his engine would obviate an inconvenience sometimes felt for want of injection water for condensation.

In 1806—we follow Professor Pole's narration—Trevithick had a non-condensing high pressure engine at work for drawing ores at Dolcoath mine. This was called by the people "a puffer," from its blowing the steam off into the air. This worked well for a time, in comparison with Boulton and Watt's, but did not in the end answer the expectations conceived, so that though he received several orders for engines from the neighborhood, it is doubtful whether he executed the orders given to him. At any rate, the non-condensing high pressure engine was never much used.

About this time, Trevithick made the first proposal for introducing the use of high pressure steam, worked expansively, to a greater extent than formerly, and substituting, for the common boiler, his cylindrical boiler. This is one of Trevithick's great merits.

In some of the first high pressure engines, manufactured by Trevithick, he used the steam expansively; for in July, 1804, he alludes to the saving of coal effected thereby; but the idea of substituting high pressure steam in the then existing Boulton and Watt pumping engine, and of expanding it down to low pressure previous to condensation, seems, according to Professor Pole, whom we follow, to have occurred to him about 1806, as above stated. On the 18th of February, 1806, he wrote to Mr. Davies Gilbert for his opinion on the practicability of the plan, and that opinion seems to have been favorable. Anxious to make trial of the plan, Trevithick proposed to adopt a new boiler, of his own construction, to Dolcoath great engine, and to work it with high pressure steam expansively. He describes minutely, that "it is not intended to alter any part of the engine, or condenser, but only to work with high pressure steam from this new boiler."

As Professor Pole† remarks, Trevithick's plan would, if carried out, have produced engine nearly the counterpart of those now used. As Trevithick was considerably in advance of his age, his suggestions were not then adopted, and the progress of the steam engine was thus delayed until a later date. One reason which Trevithick assigns in favor of his plan is particularly worthy of observation. He gives his opinion that the momentum of the vast mass of matter the great Dolcoath engine had in motion would answer in effect the purpose of a fly-wheel, by regulating the motion of the engine. It is well known, now, that the great mass of matter in the pump rods, balance bobs, &c., consequent upon deeper workings, has been the principal cause, whereby the modern engineers have been enabled to use expansion to a much greater extent than formerly. This is one among the many proofs of Trevithick's great sagacity and foresight.

During the early part of this century, Trevithick spent much of his time in the metropolis, engaged in promoting his various inventions, and he secured at times the co-operation of many of the active and enterprising men of that day, who were acquainted with his merit. Among these associates

of his pursuits were the Earl of Stanhope, Mr. Davies Gilbert, Mr. Isaac Rogers, Mr. Allen, of Plough-court, Mr. Henry Clarke, Mr. Knight, of Foster-lane, Mr. Taylor, Mr. Nicholson, Mr. Arthur Woolf, and many others.

Among Trevithick's undertakings were included railway and common road locomotion, draining, ironmaking, coining, water pressure engines, mint machinery, railways, silver smelting, dredging machinery, steam navigation, expansion, tunneling under the Thames, ships' tanks, engines of recoil, and air engines.

In 1809, Trevithick was employed in his Thames Tunnel plan, for which a small subscription was raised among his friends for an experimental driftway, as a preliminary to show the practicability of a larger work. The driftway was to be run parallel to the bed of the Thames, and the committee of subscribers felt every assurance of the success of the undertaking, for the operation was very simple, and they had every confidence in Trevithick's ability, and his knowledge of underground works.*

This was the second tunnel attempted under the Thames, Ralph Dodd, the famous projector and afterwards partner with George Stephenson in the locomotive, having obtained an act of parliament for the first, at Gravesend, in 1799, and commenced his work, but which was soon defeated by water flowing in through fissures in the chalk.

Trevithick's tunnel was at Rotherhithe, a short distance from Brunel's tunnel. He committed the usual error of going too near the bottom of the river, the object being a close run, endeavoring to keep at the least possible distance from it, and to save labor and expense, as the funds were limited. Had his experiment been carried through, he would also have been able to give a plausible cheap estimate of the intended tunnel, leaving the increased expenses to be met as they could. Trevithick's error was not productive of much inconvenience to him, nor does it seem to have been the immediate cause of the abandonment of the enterprise, for he carried his driftway to a greater extent without impediment than Dodd did before, or Sir Mark Brunel did afterwards. It was not until he had gone 930 feet under the river,† that he encountered any obstacle, when he got into a hole in the muddy bottom of the river; and at one time a piece of uncooked ship beef, which had fallen from one of the vessels, drifted into the works.

Although the corporation authorities refused to allow him any facilities, he managed to get this hole stopped, and again went on with vigor. He carried on the excavations at the rate of from four to ten feet per day, and soon completed a thousand feet, to the great joy of all parties concerned.

On arriving at this distance, according to previous arrangement with the committee, Trevithick was to receive a hundred guineas, which, after the verification of the work by a surveyor, were paid to him. According to a contemporary‡ and the end of which seems to be in perfect keeping with Trevithick's character, the surveyor reported to the subscribers confirming the measurement, but asserting that the line had been run a foot or so on one side. This statement, which, if well founded, was not material, Trevithick took in high dudgeon, and chose to consider it as a severe reflection on his engineering skill. His Cornish blood was excited, and, with his usual impetuosity, he set to work to disprove the assertion, without any regard to his own interests or those of the subscribers.—He is said to have adopted the absurd contrivance of making a hole in the roof of the tunnel at low water, and pushing up a series of joint rods, which were to be received by a party in a boat, and then observed from the shore. On the prosecution of this scheme, Trevithick was engaged below, and as delays ensued in fitting together the rods, the gully formed by the opening in the roof at length admitted so much water as to make retreat necessary.—With an inborn moral courage, worthy of a better cause, he refused to move first, but sent the men before, and very nearly fell a sacrifice to his devotion. It has been already observed, that the drift-

way was parallel to the bed of the river, and therefore curved. It necessarily happened, that the water would lodge, as in a siphon, at the bottom of a curve, at which part, on Trevithick's arrival, he found so much water as hardly to enable him to escape, and as he got up the slope on the other side, and climbed the ladders, the water rose with him at his neck. Young Brunel afterwards showed a like gallantry in the other tunnel. The work thus ended after having reached 1011 feet, being within 100 feet of its proposed terminus, and is a melancholy monument at once of his folly and his skill.

On a subsequent occasion, being cross examined as to this occurrence, while witness on a trial, he is said to have admitted the fact of ruining the works, and to have asserted his determination, in any similar circumstances, to defend his own character at whatever sacrifice to other people.

Before this time, Trevithick had brought into use his waterpower engine, one of which was long at work in Cornwall. Water was used as the prime mover.* One of these was put up at the Druid mine.†

In the spring of 1812, Trevithick was fortunate enough to be able to put his ideas into practice, as to expansive working of high pressure steam.‡—He had occasion to erect a small engine at Wheal Prosper mine, of which he was the sole engineer, and in this engine he took the opportunity of trying the effect of the plan he had so long ago proposed. This, Professor Pole says, appears to have been the first Cornish engine ever erected; that is, the first condensing engine, working with high pressure steam expansively, and having the present form of boiler. Professor Pole gives a description of the engine, with which he was furnished by Mr. Richard Hosking, of Perran Foundry, who worked it under Trevithick.

The steam pressure on the boiler was more than 40 lbs. per square inch above the atmosphere, there was no throttle valve, the steam valve was large, and therefore when the steam was first admitted into the cylinder, it must have acted with nearly its full force upon the piston. The engine worked, under its usual load, more expansively than was customary, even with engines in modern days, except some erected within the last five years. The steam was cut off at one ninth or one-tenth of the stroke. When, however, the load was increased, the degree of expansion was accordingly diminished, and the engine was thus made to lift, by the high pressure of the steam used, a load which had never before been thought possible, showing thereby the great advantage which the method employed would offer, in adapting the capabilities of the engine to the variable nature of the duty required to be done by it.‡

Arthur Woolf also proposed a modification of the expansive principle, and took out a patent for it in 1804. Trevithick proposed his scheme in 1806, and built a Cornish engine on his plan in 1812.—Woolf brought his engines into Cornwall in 1813 or 1814.§ The success of Woolf's engine for some time delayed that of Trevithick's.

In 1815, on the 6th of June, Trevithick took out a patent for what he called a plunger or pole engine. This engine succeeded very well for a time, but having been superseded by a simpler form, it did not survive. The first engine of this kind was put up by Trevithick, at Herland, in 1815, the steam being worked at a very high pressure. In writing to Mr. Davies Gilbert, he asserted its successful trial; but overrating its power, he attempted to make it command the whole water of the mine, a work which would have required two 80-inch engines of the present construction, his engine being 33-inch. As Professor Pole observes, Trevithick failed in the attempt, as he usually did when he aspired at too much. At a subsequent period, Mr. Wm. Sims purchased the patent right of this engine, and applied its principle in the alteration of several engines, which became for several years

* Nicholson's Journal, vol. 1, p. 162; p. 5.

† Mechanics' Magazine, vol. 2, pp. 15, 271.

‡ Pole on the Cornish Engine, Appendix G., p. 51.

§ Professor Pole, in Appendix G., p. 52.

¶ Ibid. p. 54.

* Poole on the Cornish Engine, p. 45, Appendix G.

† For the account of Trevithick's discoveries in high pressure steam, Professor Pole's book is the only authority, and he has treated the subject with the greatest ability and impartiality.

* Mechanics' Magazine, vol. 1, pp. 66, 67; vol. 3, pp. 205, 384; vol. 7, p. 365.

† Ibid. vol. 1.

‡ Civil Engineers' Journal, 2, p. 94.

formidable rivals to the best engines in the country.

Trevithick had also invented a cylindrical boiler for the generation of steam, having an internal fire tube. One of them he was about erecting in December, 1804, in South Wales. It was 24 to 26 feet long, 7 feet diameter, internal fire tube 4 feet 4 inches diameter at the wide end, and 1 foot 9 inches diameter at the narrow end, being very nearly the same dimensions as in the present Cornish engines, except that the fire tube is often made of equal diameter throughout. Mr. Pole observes that the perseverance Arthur Woolf showed in bringing his double cylinder engine into operation was chiefly effectual in stimulating the Cornish engineers to avail themselves of Trevithick's plan, by opposing it to the more complicated one of Woolf, and thus to show that it possessed advantages which they had neglected or thought improbable when Trevithick had offered them years before. Woolf himself subsequently adopted Trevithick's boiler.

To be continued.

An Essay on Pen and Pocket Cutlery,

Embracing a Detailed Description of the Mechanical, Chemical, and Manual Operations Performed on Certain Raw Materials, to Convert them into the Means, Implements, and Materials, for Manufacturing Pen and Pocket Knives.

BY A. L. HOLLEY.

Continued from page 470.

CHAPTER VIII.—PRESENT YANKEE METHOD OF MAKING A FOUR-BLADE CONGRESS AND A COMMON JACK KNIFE. FLY PRESS. DIES, PUNCHES AND OTHER MACHINES.

The grinder having taken the knives as left in the last chapter, glazes, laps, and polishes the faces, swages and backs of all their blades on wheels before described. Before the steel is polished, care is taken to remove all cake emery and tallow which may remain in the nail mark, for any grit or oily substance would destroy the effect of the crocus.—When the grinder has completed his work on the knives, they are returned to the finishing room and honed. The best hones used in Sheffield are found in Germany, though a superior but very scarce article of the kind is made from the greenstone found among the ancient pavements of London, and good hones are also found in the United States. The stone is from one to two feet long, and from one to two inches wide, to which oil is applied. The blade is held not with its face on the hone, for in this case the polish would be removed, but with the face slightly elevated, so that the edges may be bevelled by the stone. The finisher usually tests the whittling powers of his blade, by drawing it across and cutting into the skin of the palm of his hand. The knives are now brushed on the joints with fine lime, thoroughly cleaned and wiped without and within—particularly the blades and springs, which would rust by the slightest moisture—with shammy skin, when they are entirely finished. The grinder's work is perfect when the steel is evenly polished, and no scratches and marks appear, and when the blades are not bent and softened by too much heat.

Let us now look at the present Yankee method of making the same knife, and show the improvements and changes which Yankee *go-ahead-a-tive-ness* have already wrought. The scales are made by cutting them from sheet brass by a machine consisting of shears and gauges; the holes for the bolster pins are made by either a hand screw press—which consists of a fixed nut and fixed die or circular hole, and a punch which corresponds with the die, and is moved vertically by the screw—or by a press which dispenses with the power gained by the screw, and it is worked by either steam or

water. The bolsters are cast and fastened to the scale ends as before described. The material maker then by a single operation, which with the aid of machinery is accomplished in an instant, dispenses with trimming the scale ends, marking the bolsters, and drilling the small holes for the covering. The machine used is a fly press, consisting of a balance wheel which rolls on, not with the shaft, and to which the motive power is applied, also a die and punch, and the apparatus to move the latter. The die consists of a mortice shaped like the pattern of the knife in which a plate containing orifices corresponding with those in the scale, and indentations similar to the bolsters is supported by a spring. The punch consists of a plate shaped like the knife, with steel pins projecting from its lower surface and fitting the orifices in that plate which moves in the die, and is fastened to a carriage which moves vertically. A moveable step below the machine, when pressed down by the foot of the operator, will cause a pin to connect the fly wheel to the shaft, and thus move the carriage and punch. The circular motion of the shaft is converted into the vertical motion of the carriage by a crank, or eccentric wheel, with or without the apparatus, called by Arnot the seventh mechanical power. By placing the scale as just left on the die, and pressing down the step, the carriage will descend, the bolsters and scale will be trimmed by the edges of the die and punch; the pin holes will be made by the points projecting from the latter, and the bolsters will be marked for drilling by two short points at either end of the punch. In this state the scales are taken by the cutler, and the bolsters bored as fast as they can be laid on the carriage of a machine, which consists of a drill standing vertically, and moved round from 1000 to 1500 times per minute by a belt from a drum in the rear. The scales are then put up in points, the edges of the bolsters fitted for the covering, and the edges of the scale more perfectly fitted to the plate by files, if necessary, which is not often the case. The scales are then dished, and the covering prepared, matched, and put on as before described. The springs are taken from the material maker, who by a single operation by the aid of the dies and punches of the press, dispenses with the entire work of the spring forger, with marking the spring, and with the greater part of the filing necessary to fit it in the old way. They are then bevelled, and the fash is removed by a drop—which is a weight falling from a certain height on to an anvil or boss—and drilled like the bolsters, by machinery. They are now almost perfect, and ready to harden, but are filed on the inside, and then between two plates, bent, hardened and tempered. Before the idea was suggested of marking the spring at the same time it was cut out by the press, they were marked by striking them as they lay on a steel plate, furnished with gauges, and an upright pin. The blades are cut from sheet cast steel by the press, dies and punches, with a blunt joint, but perfect tang, and the cutting part forged by hand, as described in Chap. III.: thus they are squared and marked by one operation. They are then drilled by machinery, fitted and dressed as before described. The spring holes in the covering are drilled in a like manner, and the knives put together and finished by the old English method. This is not the manner in which all, or the greater part of fine knives are now made in America, as the machinery is not yet perfected, or universally employed. As long as such materials as pearl and shell are used for fine knives no very great improvement can be ex-

pected, as yet, and the labor saving machines must be perfected first, on jack knives and coarser work.

We will now look at the present method of making straight common jack knives, called flat backs, in America, which, though not as highly finished as fine knives, are made expressly for, and adapted to hard service. The blades are cut out by a method described in Chap. III., hardened and tempered, and ground as blades usually are [see chapter IV.] and are then ready for the handle maker.—The iron scales and bolsters used for jack knives, and made in a solid piece, are usually in England forged from nail rods by a scale forger, who heats a portion of the rod, strikes the bolster in a boss on one end, and flattens enough for a scale, which is finished in two heats. This is a long and slow process, but still resorted to by some manufacturers who think forged scales are superior to others, because more tenacious and harder. As long as scales made cheaper are good enough, and answer every purpose, though not equal to forged, it is as well to use them as any. They are made solid, however, perfectly and in great quantities by machines, which consist of two iron rollers, similar to those of iron rolling mills, one of which is turned smooth and even on the surface, while around the circumference of the other are screwed bosses equally distant from each other. These rollers revolve with the same velocity, and red hot rods being passed in at one side, come out at the other a long string of scales and bolsters, which are cut apart by machinery. Another machine consists of a shaft, in the centre of which is a raised bolster boss, which meets a raised plain boss on the other shaft, which revolves at the same speed, and will make a scale and a bolster at each revolution. Solid scales have been made by a drop, furnished with bosses, and in other ways, but neither of these methods have as yet been brought to perfection, though one will certainly answer every purpose eventually.—The majority of iron scales are probably made of two pieces. The bolster is struck by a hand hammer or by a drop, in a boss, and cut off by a shears formed from two chisels, which operation is very speedily performed. A pin is also formed by the boss, which projects about an eighth of an inch from the bolster. The scales are very easily cut from sheet iron, and are finished with the bolster, like brass scales, as described in chapter VI. The scales, after either of these operations, are of course differently shaped, and do not fit the plate, but the edges are cut off by a die and punch of the fly press, and not till within a few months the blade rivet hole has been marked, and the four other holes made by the same die and punch, as fast as they can be laid on and taken off, as before described. By comparing these operations with those of the English cutlers a few years ago, we find a very decided improvement, for which we are certainly indebted to Yankee ingenuity and contrivance.—The bolster holes are now drilled by machines, nearly as fast as they can be taken up and laid down, and till recently all the scale holes were drilled, by laying it on a wood boss, and placing the plate over it for a gauge. They are now put up in points, the edges more perfectly fitted to the plate by a file, and the outsides are already regular and fitted for the covering. The springs are cut out, and marked by the press, then drilled by machines, filed inside, and on the ends, bent, tempered and glazed on the end and inside, as before described. The covering is fitted and put on as usual, trimmed by a circular saw, filed down to the metal scale, and coarse and fine glazed on the front edge. The

blade tangs are then glazed and burnished on the edges, and the whole is rivetted together. The backs are then ground, sometimes on the Wickersly, but usually on the Nova Scotia stone, after which they are glazed, then polished on an emery wheel with charcoal and boulder, [see chap. VII.] The knives are then hafted and buffed as before described, when the grinder glazes the blades, after which they are honed and cleaned ready for packing.

A machine has been recently put in operation, in one of the manufactories of Connecticut, which fits the covering to the bolsters, and consists of gauges, a moveable carriage, and a burr wheel similar to a circular file, and is used chiefly for jack knives.—Burr wheels are occasionally used to fit the edges of covering to the scale. Numerous machines are in contemplation, and some in the process of building, which it is hoped will dispense with a great portion of the manual labor, now performed on jack knives. Many little jobs, as they are considered, formerly accomplished by hand, will be finished in less than one quarter of the time now occupied, and many of these little jobs will be dispensed with entirely. English operatives, although more careful, and perhaps more skilful at present than Americans, perform the most difficult operations by hand, and by steady and long continued manual labor, produce most beautifully wrought and finished fabrics, but obviously never indulge the idea that this may be accomplished by an easier and shorter method; while the Yankee workman is not content to go through the same tedious routine of slow manipulation day after day, but "toils and studies to perfect a machine, which will do his work twice as speedily, while he puts on the steam, and studies to drive it a little faster. The perseverance and inventions of the latter are indispensable in these days of improvement," while the thoroughness and skill of the former, though commendable, does not keep pace with the vicissitudes of the times. The people must have pocket knives, and they will have them cheaper than they can be made by hand in this country, cheap in proportion to other goods, and the manufacturer must live, consequently he must employ machines to operate for him much faster and cheaper than workmen can labor.

To be continued.

THE IRON DOME OF THE INTERNATIONAL EXHIBITION HALL.

The construction of this dome, 200 feet in diameter, though of light sheet iron, will be no joke.—We may remind the reader that it will be double the size of our St. Paul's dome, which is about 112 feet in diameter. The dome of St. Peter's at Rome, is 139 feet in diameter, and that of the Pantheon 142 feet. This central hall will be a polygon of sixteen sides; four of which will open into gardens, reserved around it. Its main walls will be of brick, and about sixty feet high.—*The Builder.*

The Remington Bridge.

Montgomery, Ala., July 18th, 1850.

TO THE EDITOR OF THE R. R. JOURNAL:

In your issue of 6th July, there appeared a brief criticism on the Remington bridge, which is not entirely correct in its scope and bearing, and which, with your permission, I will briefly notice.

1. You say your are "informed" I use truss work, making the bridge simply a truss bridge.

2. That there is no new idea or principle in the bridge: wooden suspension bridges, of rude structure, having been in use in South America from time immemorial.

3. That the model in New York is a very pretty toy—although 160 feet long; and that if we must

have suspension bridges, iron is stronger in proportion to its weight, is more durable, and will prove more economical in the end.

1. In reply to your criticism of which the above stated points constitute the gist, permit me to remark: the Remington bridge is not a truss bridge, nor does it in any particular partake of that character of bridges. On the contrary, the truss principle is studiously avoided. I need not tell you that a wooden bridge of 400 feet span, with even a three feet depth of truss, on any known principle except that on which I construct bridges, would not sustain its own weight. Now, the Remington bridge may be built of a much greater span, and will sustain, in addition to its own weight, *five hundred tons*. I say *five hundred tons*, that your credulity may not be excited. I know it will sustain even a much greater weight. That the Remington bridge can be built without truss work for 406 feet span, is demonstrated by a practical bridge in this city—the actual cost of which does not exceed *four dollars and fifty cents per running foot*; and which is built to show the plan on which railroad bridges are to be constructed. Am I right in the opinion that this bridge of 406 feet span is the longest single span bridge in the world?

2. That wooden suspension bridges, of rude structure have been in use in South America from time immemorial is true. But these bridges, so far as we are informed, were constructed either from the bark of trees, or small trees twisted into the form of a rope. Of whatever material they were constructed, they were simply rope suspension bridges, and were never expected to sustain more weight than the traveller or porter and his burden. The effect of weight in passing over one of these bridges is totally different [owing to a total difference of construction] from its effect on the Remington bridge. In the Remington bridge there is neither undulating or lateral motion, no matter what be the weight upon it. In the rude bridges of South America the slightest weight would produce very great undulating and lateral motions; and this material and very important distinction is owing to the distinctive principle which govern the construction of either structure. Another very important distinction between a suspension bridge and the Remington bridge is, that in the former, whether it be a rope or chain bridge, the weight when it enters upon the bridge is not equalised over the whole sustaining strength. It is only equalised when it reaches the centre. Hence the actual strength of the bridge is only attained at *one point*—the centre. Not so the Remington bridge; in that the strain is equally divided at *all points along the longitudinal supporters*. They will sustain as great weight near the abutments as in their centres. It is this important principle that I claim as new and novel in this bridge. To illustrate more clearly this point I will add that, *the tensile strength of timber when in nearly a horizontal position is made to sustain nearly the entire weight necessary to separate the fibres*. This I claim is a new idea in mechanics. I applied it in the use of timber in constructing bridges for the first time. The same fact does not apply in any suspension bridge, whether constructed of hemp or iron. Another, and very important distinction between a suspension bridge and the Remington bridge is, that in the former, only a very small portion of the material used can be made a *sustaining power*. The material that is not [excepting of course the towers] is a *dead weight* on the material that is; and as a necessary consequence, there is very great dead weight to sustain before a single

pound of loading is put upon such a structure. In the Remington bridge every inch of material, every nail [except of course the abutments] adds to the strength of the structure. Longitudinal supporters, hand railing, flooring, are all constructed so that the greatest strength of all the timber used is obtained.

3. With due deference to your judgment I must continue to believe that a model bridge, one hundred and sixty feet span, constructed of four stringers one inch square, *which will sustain as much weight as the safety of the building in which it is erected would allow the application of*—is entitled to be regarded as involving more important principles than are necessary to constitute a toy. But altho' its capacity to sustain weight, if it be properly constructed, is as I have stated, still it must be understood that this model is a model of the Remington bridge only so far as it demonstrates the tensal strength of timber laid in nearly a horizontal line. Neither can I agree with you that iron suspension bridges are "stronger, more durable, and cheaper in the end." To demonstrate the strength of the Remington bridge I send you herewith a report of a test trial of the strength of a model bridge in this city, in December, 1849. In this bridge three stringers one inch square sustained fourteen and a half tons at a curvature of one-fiftieth of their chord line. Now, sir, the best charcoal iron, with a curvature of one-fiftieth of its chord line will only sustain *three tons* to the square inch, and consequently if the stringers had been iron, in the bridge referred to, the breaking point would have been at nine tons. For the facts as to the sustaining strength of iron, I refer you to Talford, than whom there is no better authority. Thus much for strength. In reference to durability permit me to remark that you are also, as I conceive, at fault. A wire suspension bridge is never covered—at least I have never heard of one being covered—and is therefore subject to oxidation, notwithstanding it may be repeatedly painted. The thousand joints and joinings are thus exposed and injured. The longitudinal supporters, which are the important points of a Remington bridge, are as secure from moisture as any encased timber can be, and being in their centre rarely over $1\frac{1}{2}$ inches thick may be obtained from heart timber. Moreover they are so constructed that they may be replaced at pleasure. Understanding this important fact, it is only necessary to remark [to convince any reflecting mind that the durability of the Remington bridge may be measured by very many years] that stone, brick or cast iron abutments are as well adapted to it as are wooden abutments. A cast iron abutment would perhaps endure for a century. As the longitudinal supporters required removing they could be secured to these abutments with very little more trouble than is required to set up a pair of folding doors. The next and last point in your criticism is cheapness. In this particular the Remington bridge has no competitor. I do not deem it necessary to dwell upon this point. I will briefly remark, that the entire cost of a Remington bridge for any given span, would not exceed the cost of the wood work alone,* in a suspension bridge of equal span. Thus you will perceive the disparity is very

* In a wire suspension bridge of 400 feet span there is used as much timber as would construct a Remington bridge of the same span. In addition to this the mechanical labor on the wood work of a wire suspension bridge would equal the cost of labor necessary to build a Remington bridge.

great between the cost of the structures. Should a wire suspension bridge of 400 feet span, complete in everything, cost \$20,000, a Remington bridge of the same span would cost \$2,000.

JNO. R. REMINGTON.

AMERICAN RAILROAD JOURNAL.

Saturday, August 3, 1850.

Railroads in New York City.

The Hudson river railroad company has been administering a coated pill to the people of New York, in the shape of a locomotive, closely boxed up, eating its own smoke; and but for the noise made about it in the newspapers, we do not know but our citizens would have remained ignorant that any such monster had been quietly and harmlessly traversing our streets. The gradual appropriation of the whole lower part of the Island to places of business, compels the greater part of our business men to reside from two to four miles "up town." At least one half, and in many cases an hour, is consumed both at morning and evening in going to, and returning from business. This is a very great loss and inconvenience, which is daily becoming greater. New York can spread in only one direction, and this fact has already built up two large cities in our neighborhood; a greater part of the inhabitants of which would have remained on our Island, but for the difficulties of getting to their places of business, and from the high rents consequent upon the crowded state of the lower part of the city.

Now we are satisfied that it is for the interest of New York, in whatever way viewed, to allow the locomotives of the Hudson river and Harlem railroads to run to the lower part of the city. It would cost a large sum to open roads for this purpose, and guard them from liability to accidents, but the advantages that would result from doing so would justify the outlay. The expense is the real objection. The danger to be feared from the trains exists more in the imagination than reality. Look at Boston. Her railroads penetrate the very heart of the city in every direction, cross important streets and the trains are drawn by locomotives at high speeds, yet we hear no complaints, and accidents very rarely occur. Nothing could induce the people of that city to prohibit the running of railroad trains within its confines. They are there the greatest of conveniences. A merchant can step from his counting room into a car, and in thirty minutes, in less time than suffices our merchant to reach his home up town, the former is at his residence fifteen miles from the city. If we had a railroad running from the Battery to the head of the Island, our people would prefer to remain upon it, instead of going to Brooklyn, Williamsburg, Jersey City, etc., for the sake of enjoying the Croton water if for no other reason.

The inconvenience of which we have spoken it is admitted by all, is seriously prejudicing the interests of this city. The examples of Boston shows that no danger is to be feared from running a well managed locomotive through it. The objection against this is owing rather to prejudice than to any sufficient reason. Such being the fact, cannot something be done to secure so desirable a result?

New Hampshire.

Eastern Railroad.—The old board of directors have been unanimously re-elected, as follows:—Ichabod Goodwin, Portsmouth; Daniel P. Drown,

Portsmouth; Isaiah Breed, Lynn; Benj. T. Reed, Boston; Stephen A. Chase, Salem. Ichabod Goodwin, President; Daniel P. Drown, Secretary; and Wm. S. Tuckerman, of Boston, Treasurer.

Remington Bridge.

Our readers will find in this number a communication from Mr. R. in relation to his bridge. A notice of the article was crowded out of our present paper by a press of other matter. It will appear in our next.

The Iron Interest.

We give up a large part of our paper of to-day to communications upon the iron interest of the country. Independent of the influence they are calculated to have upon the action of Congress in modifying the rate of duty upon foreign iron, they possess great interest as presenting a mass of statistical information with regard to one great branch of national industry, never before made public.

Communication Across the Continent.

We invite attention to the article in our present number upon the importance of Congress taking immediate measures to provide for the greater safety and convenience of the immense tide of emigration now moving towards the Pacific. We shall recur to this subject in our next.

The Maine and Nova Scotia Railroad.

The great convention to promote the above project was held in Portland on the 31st instant. It was very numerous attended by delegates from the British Provinces, and from the Eastern States.—The high standing and respectability of the delegates in attendance, and the character of the proceedings will at once give this project a very prominent place in the public mind.

The convention was organized by the choice of the following named gentlemen as officers:

HON. JOHN HUBBARD, Governor of Maine, President.

Vice Presidents:

Admiral the Hon WM. FITZWILLIAM OWEN, of New Brunswick.

His Worship, HENRY PRYOR, Mayor of Halifax.

" HENRY CHUBB, " St. John.

" JOHN SIMPSON, " Frederickton

Hon JAMES B. CAHOON, " Portland.

" FREEMAN H. MORSE, " Bath.

" H. A. S. DEARBORN, " Roxbury, Ms.

Gen. ALFRED REDINGTON, " Augusta.

Hon. TIMOTHY BOUTELLE, of Waterville.

" H. C. SEYMOUR, State Engineer, of N. York

" P. M. FOSTER, Prest. of Senate of Maine.

" SAMUEL BELCHER, Speaker of H. Reps.

" E. L. HAMLIN, of Bangor.

" ANSON G. CHANDLER, of Calais.

" J. BELL FORSYTH, Esq., of Quebec.

" F. H. ALLEN, Prof. of Law, Cambridge, Ms.

Dr. JAMES ROBB, Prof. of Natural Philosophy, Frederickton.

Secretaries:

F. R. ANGERS, Esq., of Quebec.

ALLEN HAINES, Esq., of Portland.

GEO. A. THATCHER, Esq., of Bangor.

WM. JACK, Esq., of St. John.

JOHN ROSS, Esq., of Nova Scotia.

On taking the chair, the President addressed the convention as follows:

Fellow citizens and gentlemen of the convention—I thank you for the distinguished honor you have conferred upon me, in calling me to preside over your deliberations. Such services as I may in this position render, in promoting the important objects of this meeting, shall be cheerfully and impartially bestowed.

We are assembled, fellow citizens, to interchange opinions, to impart mutual information,

and to deliberate upon a subject that is pregnant with consequences of the highest import to this and future generations. It is no less an object than to ascertain the best channels and the best means for putting us in direct and speedy communication with each other and with the whole world to give us the easiest and cheapest means for the interchange of commerce and of mind; to enable us to develop and bring into productive energy the unparalleled natural resources of our State; in short, to bring us in communication with the spirit of the age.

Maine must not be delinquent to herself; we may not be recreant to ourselves and to posterity.

Our brethren of this beautiful city have volunteered to become pioneers in a railroad enterprise, worthy of the State and of the age. With a spirit of self-sacrifice which does honor to themselves and to the times, they have staked their all for the common good of the State.

This enterprise, gentlemen, is however, but the beginning of the end.

We want accurate knowledge of our natural facilities for communication; we want a clear comprehension of the expenditures necessarily involved in developing such facilities, and of our ability to meet such expenditures; then only can we advance with safety and certainty.

Then shall Maine at her appointed time attain to that exalted rank among her sister States which she is destined to reach.

Brethren of the British Provinces, we bid you a hearty welcome. Most cordially will we unite with the sons of our father land, in all the measures calculated to promote our common good, and to advance the cause of freedom and humanity.

On motion of John A. Poor, Esq., the following gentlemen were appointed a committee to report upon the business of the convention, viz:

David A. Neal of Salem, Josiah S. Little of Portland, George W. Stanley of Augusta, J. R. Chadborne, of Eastport, S. R. Hanscom of Calais, Hon. J. W. Johnston of Halifax, John Wilson of St. Andrews, John H. Gray of S. John, Hon. L. A. Wilmot of Frederickton, M. H. Perley of St. John, R. B. Dickey of Cumberland, Hon. J. B. Uniacke of Halifax, Hon. Edwin Bottsford of Westmoreland, John Howe of Boston, A. W. Haven of Portsmouth, Ichabod Goodwin of Portsmouth, J. Bell Forsyth of Quebec, Hon. Ruel Williams of Augusta, Hon. T. Boutelle of Waterville, John Neal, John A. Poor and F. O. J. Smith of Portland.

The meeting then adjourned to 3 o'clock, P. M.

AFTERNOON.

The meeting was called to order according to adjournment, and the Committee on Business not being ready to report, Hon. Robert Rantoul was called upon and addressed the meeting in regard to the importance of constructing a line of railroad between the proposed points—speaking of it as one of the greatest projects of the age, etc.

Mr. Rantoul having finished, the Chairman of the Committee on Business, Mr. Wilmot of New Brunswick, presented himself, and stated that the Committee would not be ready to report till to-morrow (this) morning. He requested on the part of the Committee, that they might be allowed to sit during the convention, and from time to time report upon such business as might be deemed necessary, etc.

His report was accepted.

Memorials and papers embodying resolutions, etc., of meetings held in various sections on the

route or routes proposed, were then read, some tendering money, materials and facilities in aid of the great work—and evidencing unlimited enthusiasm in regard to it.

John A. Poor, Esq., then read letters, expressive of interest in the success of the undertaking from the following gentlemen:

Millard Fillmore, President of the United States, Edward Everett; Levi Woodbury, J. Phillips Phoenix, H. Hamlin, J. W. Bradbury, N. S. Littlefield, B. Silliman, Joel W. White, Hon. George Moffat of Montreal, A. T. Gault, Esq., President of the St. Lawrence and Atlantic railroad, Lieut. Maury, U. S. Navy, and a great number of others.

The meeting was then addressed by Mr. Watts, of Frederickton, and by Hon. J. B. Uniacke, Attorney General of New Brunswick; after which it adjourned to meet at 9 o'clock the next morning.

We are not able to give the second days proceedings in our present, but shall give them fully in our next number.

Railroad Negotiations and Progress.

Since our last, the Milwaukee and Mississippi railroad company has purchased through its President, B. Kelborn, Esq., iron for 55 miles of road. This distance carries the road into the Rock river valley, the garden of Wisconsin, and secures for it a large business as soon as it shall be opened.—Twenty-five hundred tons of the above were purchased of Reeves, Buck & Co., of Philadelphia, and are to be manufactured at their works at Safe Harbor. The price paid for these has not transpired; and though it is probably above the cost of the foreign, the difference it is believed, will be made by the superior quality of the domestic article.—The high standing of Reeves, Buck & Co., and the interest they have in furnishing a first quality rail, is certainly a sufficient guarantee for this. An American manufacturer, to succeed, must make a superior article. The home is his only market. He cannot, like the Englishman, send his refuse rails to a foreign market, and escape the consequences of selling a bad article. That the English manufacturers can, and do make good rails is admitted; but that, at the present low prices, they make a great many very poor, is equally true. A majority of these inferior rails are sent to the United States; and it frequently happens that at the very lowest rates, our companies pay much more for them than they are worth. The rail to be made by Reeves, Buck & Co. is to weigh 50 lbs. to the yard, and will cost per mile about the same as the common sized English bar. It is to be delivered in New York in season to forward to Milwaukee before the close of navigation.

The whole length of the line of this road to the Mississippi river is two hundred miles. This the company propose to complete in three years from the present season.

The East Tennessee and Georgia railroad company have, we understand, contracted, through Raymond & Fullerton, of this city, for 8,000 tons of rails, manufactured by the firm of Bailey, Bros. The rail, if we mistake not, is to be of the U pattern, the same as laid on the Atlantic and St. Lawrence, and the York and Cumberland, Penn., roads. The above amount will carry this road to the Tennessee river, a distance of 80 miles from Dalton, its point of departure from the Georgia road. Dr. Ramsay, the agent for the expenditure of the State road, Mr. Keyes, President of the road, together with M. B. Prichard, Esq., the Engineer, are now in this city.

Connecticut.

Norwich and Worcester railroad directors chosen at the annual meeting July 10—

Joel W. White, President, Alex. Dewitt, J. N. Perkins, John A. Rockwell, Elihu Townsend, Wm Aug. White, David A. Neal, Jed Huntington, and Charles Johnson.

A report of the directors was unanimously adopted. It says—

Holders of 14,160 shares of the old stock have subscribed for their proportion, 25 per cent., of the new stock, making now 40,700 shares of preferred stock, and leaving only 2,840 shares of old stock not subscribed on.

A dividend of 2½ per cent. out of the net earnings of the six months, ending 31st May last, was declared on the preferred stock, payable 15th instant. The directors state in their report that the business of the past year as a basis the income will not be less than 5 per cent. per annum on the entire capital, when all is made preferred stock. The receipts for the first week in July are \$5,800, showing 20 per cent. increase over same time last year.

New Jersey.

Hackensack Railroad.—At a meeting of the stockholders of this company, at Congress Hall, on Wednesday last, the following persons were elected directors for the ensuing year:—

C. S. Van Wagoner, of Patterson.

D. K. Allen,

John Chadwick,

John Ackerman, Jr., Bergen Co.

Henry H. Voorhis,

Garret G. Ackerson,

John Wood, New York.

Now that the company is organized, we presume no time will be lost in commencing the work, and the road will be finished with all convenient despatch.

Impulsion.

New Mode of Locomotion

Experiments have been made upon some European railroad of impelling railroad trains by horse power; the horses being carried along in a car appropriated to them, and communicating their power in the same manner as they do to horse ferry boats, in common use. A good deal is said in its favor, but we are convinced that its only merit is its novelty. Steam power is vastly the cheapest, and may be developed to any useful extent in the space occupied by one horse. These are the reasons that led to the abandonment of horse power, and the same reasons will continue to prevent our return to its use.

North Carolina.

North Carolina Railroad and Stockholders' Meeting.—A meeting of the stockholders of the North Carolina Central railroad for the purpose of organizing the company, was held at Salisbury, on the 11th inst. Hon. Duncan Cameron, of Raleigh, acted as chairman, and John B. Lord, of Rowan, and — Phillips, of Orange, as Secretaries.

The gentlemen whose names follow were elected directors of the road for one year: Wm. C. Means, of Cabarrus, John B. Lord, of Rowan, John I. Shaver, of Rowan, Francis Fries, of Forsythe, John W. Thomas, of Davidson, John M. Morehead, of Guilford, John A. Gilmer of Guilford, Benj. Trolinger, of Alamance, Wm. A. Graham, of Orange, Romulus M. Saunders, of Wake, A. J. DeRosset, Jr., of Wilmington, A. T. Jenkins, of Newbern.

The board of directors appointed Ex-Gov. John

M. Morehead President, fixing the salary at \$2,500. John U. Kirkland, of Hillsboro' was appointed Secretary and Treasurer, and Major Gwynn, Chief Engineer.

The surveys will be commenced early in August. Three corps of Engineers will be formed for the work.

According to a provision of the by-laws adopted, subsequent meetings of the stockholders are to take place at Greensboro, Raleigh and Salisbury, alternately.

St. Louis, July 15, 1850.

Editor Railroad Journal:

SIR—The surveys of the "Pacific Railroad" are well under way, and the company will have information enough by the end of this season to admit of the location of 100 miles next spring, and the commencement of construction then. The country is more broken than the railroad sections of Indiana, Illinois or Ohio, and the general plane of the southern half of Missouri, more elevated. The prairies of the upper part of the State, through which our route passes, are exceedingly fertile and very healthy because elevated. To the north of the Missouri river, the lands are in great part taken up, the two rivers, the Mississippi and the Missouri, which bound them on three sides, affording much greater facilities to market than is enjoyed by the southern half of the State. In the southern half there remains still a large proportion of "Congress land" unappropriated, much of it of the richest and most inviting character. The table lands on all the main ridges here, and on nearly all the subordinate ridges are open prairies, yielding where cultivated, heavy crops, and where open, pastured in common by herds of cattle, and horses and mules, the property of adjoining farmers.—This land will be rapidly bought up and rapidly brought into cultivation, so soon as there are means of egress provided for its harvests. Any description of the extent and beauty of these prairies, and of the great fertility of the soil would be considered by your readers in the east entirely exaggerated.

But my object in writing you now, is to claim your aid, (in conjunction with the press generally of the Western States,) in procuring from the government a fair examination of the country between our western boundary and the Pacific, and a survey of the several routes and passes which are eligible for a road or railroad.

The interest which the Western States have in this matter seems very imperfectly understood, and the lukewarmness of the government is irreconcilable with the supposition that it can be aware of the amount of emigration which has gone heretofore, and is now under way, solely from the Western States; composed almost entirely of Americans, old settlers, or the sons of old settlers, the greater part of them in search of means to enable them to live comfortably here, and to extend their farming operations; and few with the intention of making California their future home; an itinerant population, peculiarly dependant on travelling facilities, a large fraction of it being constantly on the road. There probably is not a town or village in this State, in Illinois, Indiana nor Ohio which has not sent forth its adventurers, and in the section of this State over which I have travelled lately, embracing from St. Louis to the western line, there are few farm houses whose inmates are not in some way interested in, when not related to persons who are on the plains or at the mines—all are strongly interested therefore in any scheme

which promises to increase the facilities of communication with their friends—to make their progress on the road more rapid, more easy and less expensive. To the extent of this State the Pacific railroad will vastly increase the present facilities of travel, and the hearty support which it receives from the counties through which it passes, in their corporate capacities, and also from the owners of land individually, show that this is well understood by all classes. But beyond this State nothing is doing to improve the present savage trails, to render them, by the establishment of posts, more safe, to examine the difficult parts on the existing route and ascertain the changes that can be made to advantage, to make known where facilities for water and for pasture off and on the road exist, and to render secure such small settlements along the route as the demands of the passing emigrants for supplies would naturally create. The immense extent of the emigration, its character and its connections would have warranted an early attention on the part of the government to its security.—Many lives have now been lost which might have been saved, much unnecessary suffering has been endured, which, had a tithe of it occurred by shipwreck on any foreign coast would have created a national excitement. Had a foreign Consul been as guiltless of any kind of succor, or had a foreign government been as indifferent to the distress of our citizens under similar circumstances, as our own government has been, there would have been no end to the manifestations of indignation by the press. But our politicians seem so entirely absorbed in swaddling and unswaddling that compromise baby as to have no sense at liberty for any other employment.

Our railroad is very much interested in the speedy application of those assistances to which I have adverted. The safety of the route across the plains, and the improvement, will increase the amount of emigration; and the establishment of posts, and the supplies which will be furnished by these posts, will reduce the expenses of the emigrants, and will enable them to start and to travel with a reduced provision for contingencies, with lighter loads, and with more alacrity and cheerfulness. What we want pressingly, is the establishment of these military posts on the present travelled route. Their positions can be changed when a minute knowledge of the country shall render change advisable, but their presence now is indispensable, and their absence is all but criminal.—The outrages of the Indians are becoming more frequent. A force in presence would have kept them in check, and might possibly have altogether avoided that general war with certain of these Indian nations, which their recent irritating attacks and successes makes now all but unavoidable. We want also earnestly such a fair and careful survey of the route by some members of the topographical corps of engineers as will make plain its capabilities for a road or a railroad, and show how the mountainous country which interferes can best be passed, and will enable those acquainted with railroads to judge for themselves of the probable cost of such a communication to the Pacific on this northern route.

There is an apprehension felt here, that a more southern route, thro' Arkansas and by El Paso is favored at Washington, and it is said [without any definite source for the rumor being given] that Col. Abert and certain members of the company of topographical engineers give a preference to that route, and that a survey of that route

only will probably be provided for, and the examination of all other routes discouraged. I know enough of Col. Abert to believe that whatever opinion he may entertain topographically of such an extreme southern route to California, he would throw no obstacle in the way of such a thorough examination of other routes now travelled, as would demonstrate their true character, show how their difficulties can be overcome, and afford the means of general comparison, in regard to distance as well as grades, with particular cities and particular sections of country.

The great travel from the Mississippi valley cannot ultimately be made to pass through any one funnel. The Western States in the upper part of the valley will find a northern passage convenient to the houses of their citizens, and the Southern States will find a southerly route convenient to their section of the country, which, to emigrants of the Western States moving to California would be very circuitous. Look at the length of the Mississippi valley, and you will be satisfied that no one route can be located so as to concentrate the entire Pacific travel. The emigrants from Michigan, Wisconsin, Ohio, Indiana, Illinois, Iowa and Missouri, will not come down to the Arkansas to pass southerly by El Paso, to that part of the Pacific, whither they are bound; as little will the emigrants from Louisiana, Mississippi, Alabama, etc., be content by and by to pass across by the northern route, although to a great extent they do so now.

We may fairly assume that the routes now so generally travelled, possess certain advantages which entitle them to be thoroughly examined and improved in the first instance into good and safe travelling roads. Such roads practicable for wheel carriages, are necessary heralds of any railroad, and must precede it. The committee of the House of Representatives has reported in favor of Whitney's railroad, but I trust that the House will not commit itself to any particular project, until it has voted such an appropriation for surveys by the United States Engineers as will secure a thorough examination of the country on two or more leading routes, and place before it some disinterested testimony, where now the testimony and assertion is all most entirely exparte. The people of this State will in all probability petition Congress for such an examination. All the States are more or less interested in this matter, and nearly every individual would look with favor on any arrangements having this end in view—the greater number from motives of interest, personal or pecuniary, and the rest from the feelings of good will which fortunately accompany all important scientific undertakings—feelings that would be shared by Europeans as well as by Americans. To give any single man or company a monopoly of such a scheme without an intelligent understanding of its merits, would be very unfortunate. I hope that you will agree with me that no privileges should be given which would debar the action of any other company, or the construction where circumstances are sufficiently matured to admit of it, of any other route. We look for no unfair monopoly here, and are confident that whether as a part of the main trunk or one of its most important arms, the railroad across this State is destined to be an important link in the general line of travel towards the Pacific. The expenditure which will be made here in constructing the link through this State entitles us on the other hand to expect that no favoritism will be shown to any more southern route,

but that we shall receive that encouragement from the government, in the shape of lands and a proper survey beyond the State line, which the large interests to be accommodated by this undertaking entitle us to expect.

The promise of a fair revenue on the road thro' this State is exceedingly encouraging. Besides the business which the rapid settlement of the country will create, we have the emigration to California, which is constantly increasing, and the passenger business and the best of the freight business of the upper Missouri, from near Independence, where it is understood the road will tap the river upwards. The rapidity of the current of the Missouri, the many shifting sand bars, and the number of trees and snags which encumber it, render its navigation very hazardous and tedious. The railroad has not, for its local business, to compete with a river such as the Hudson, nor even with a river such as the Mississippi, but with one much more tedious and dangerous than the last, on which steamboats rarely make an average time of six miles an hour. A traveller will be able to pass from the mouth of the Kansas to St. Louis in one day by the railroad, whereas it occupies him ordinarily four on the river and frequently a longer time.

Your obt. serv't.,

St. Louis.

Improvement in Marine Propulsion.

A few days ago we had the opportunity of inspecting at Messrs. Johnson, Cammell, & Co.'s Cyclops Steel Works, a remarkable improvement effected in the machinery for propelling steam vessels. It is the invention of Mr. Macintosh, and is manufactured at the Cyclops Steel Works. The propellers hitherto in use have been invariably made from cast metal, and when at rest or in motion are a perfect screw, *always at the same pitch*. The improved flexible propeller [Mackintosh's], to which we refer, is made of steel well hammered and tempered and set at an angle on the revolving shaft. When at rest it is a perfect plane, but when in action it forms a screw, and, by the flexibility of the steel, assumes a finer or a coarser pitch according to the strength of the adverse action of the water through which it moves. This circumstance imparts to the vessel and machinery an easy action, especially in rough and heavy seas, which has never been attained in the rigid screws now in use. Propellers manufactured according to this patent are not more than half the weight of those made of cast metal, though the forgings are the largest yet attempted to be made from steel. It has been ascertained by experiment that in point of speed there is a gain of at least 20 per cent. In heavy seas or rough weather this propeller can be easily hoisted on board by means of a simple block and tackle, thus saving the expense of the machinery now used for raising the cast metal ones; and, from being malleable and tough, does away with the risk of breakage which necessarily ensues in the moving of a cumbersome piece of cast metal. In cost there is a saving of about fifty per cent.—This is considered to be one of the greatest improvements yet made in marine propulsion. Four of these propellers have already been made and brought into use, and as a proof of the high estimation in which they are held, it may be stated that the lords of the admiralty have ordered her Majesty's private yacht, "The Fairy," the swiftest vessel afloat, to be fitted out with one of these propellers in preference to the rigid screw. We understand that Messrs. Johnson, Cammell, and Co., have made arrangements with Mr. Mackintosh, the patentee, for exclusively manufacturing the propellers from three to eighteen feet in length.

Coal.

CUMBERLAND SEMI-BITUMINOUS COAL.

superior quality for Locomotives, for sale by

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No. 40 Wall St., New York.

May 12, 1849.

lm19

RAILROAD CAR AND COACH TRIMMINGS.

Doremus & Nixon,
IMPORTERS AND FURNISHERS

HAVE FOR SALE
Plain Garnet Plush. Fig. Garnet Plush (Butterfly pat.
" Crimson " " Crimson " (Elegant.
" Scarlet " " " (Gen. Taylor.

BROCADELLES.
Crimson Silk Brocadelles. Gold and Maroon do.
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Silk and Wool " of every color.

MOQUETTES,
Of elegant designs and colors.
GERMAN CLOTH FOR CAR LININGS.
The most beautiful goods ever shown in this country, and the subscribers are the sole agents for the sale of them.

Oil cloths Enamelled with Gold. } These goods can be
" " Silver. } furnished in any
Do. Silver ground velvet printed. } dimensions req'd.
CURLED HAIR
Of every description and quality.

JNO. W. A. STRICKLAND, Agent.
New York, 1850. 1y16

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John Mayher & Co's
NEW AGRICULTURAL WAREHOUSE
AND SEED STORE,
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Where they have for Sale, the largest and most complete assortment of Farming Implements, ever offered for sale in this city—all of which they will sell 10 per cent. Cheaper than the same kind of Goods can be bought at any other house in the city. Our Goods are all Warranted to give satisfaction.

FARMERS wanting to purchase, will please call and examine our Stock before buying elsewhere.

Among our assortment may be found the Celebrated Highest Premium Eagle Ploughs! together with all the most approved Ploughs now in use.

Also,—Horse Powers, Threshing Machines, Fan Mills, Corn Shellers, Straw Cutters, Corn Mills, Seed Sowers, Churns, Ox Yokes, Ox Scrapers, Hay Rakes, Horse Rakes, Patent Chain Pump (that never freezes nor rusts), and other Pumps; in fact we have everything for Farming Purposes—together with Guano, Bone Dust and other Fertilizers.

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February 9, 1850.
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Civil and Mining Engineer, F. G. S., London, etc.
HAVING completed his three years engagement on Lake Superior, is open to negotiate for another appointment as Mining Agent, or Superintendent of Mines. Also, to give his opinion and advice upon Mineral Lands, to Buyers and Sellers of Stock, or to be consulted on any section in this important branch of national industry.

The most implicit confidence may be relied on, and immediate attention given to all communications (pre paid). Address Capt. O. H. Matthews, Toronto, July 27th, 1850. 3m

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WE are prepared to enter into arrangements for supplying our Cement for public works or other purposes. We warrant the cement equal in every respect to any manufactured in this country. It attains a great degree of hardness, sets immediately under water, and is a superior article for masonry coming in contact with water, or requiring great strength.

For sale in tight barrels, well papered, at their office by
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The above cement is used in most of the fortifications building by government.

Railroad Iron.

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Pig and other Iron also contracted for. Sole Agent for "Baxter's Machine and Burning Oil"—particularly adapted for "Railroads"—and other Machinery—Preferred to Sperm by the many now using it, and 25 per cent. cheaper.

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THE subscribers having made extensive alterations in their works, are now prepared to receive orders for all kinds of Stationary and Marine Engines, Boilers, Locomotives, Sugar Mills, and every description of Mill Work.

Also—Orders for Iron and Brass Castings executed with despatch.

Having secured the valuable services of Mr. David Matthew as Superintendent (who has been for five years foreman in the Iron Works of John Watchman, now the Vulcan Works, Baltimore, and for 12 years superintendent of the Mohawk and Hudson and the Utica and Schenectady Railroads, New York,) they feel confident that all orders entrusted to them will be faithfully executed.

Having an extensive Wharf in front of their works, it will afford a safe harbor for all classes of steam vessels that may require repairs during the winter.

C. M. & J. C. SITER.
Gloucester, July 24, 1850. 1m

Ray's Patent India Rubber Car Springs.

Savannah, Ga., May 22, 1850.

FOWLER M. RAY, Esq.,
Dear Sir: I have no hesitation in saying, after having used on our road your springs and Fuller's, that I consider yours decidedly the best in every particular, and in this opinion I am sustained by all our officers. Fuller's spring has a tendency to split, and also to chafe or abrade by the constant friction on the cast iron plates or disc; and in my opinion is not near so elastic as yours.

Your springs, which have been in use on our road for 12 or 15 months past, and in constant use under both passenger and freight cars, are to all appearances aelastic, sound and good, as when first put in use.

We are now building eighty-five new cars, of which for fifty-sets the springs have been ordered of you.

GEORGE A. ADAMS,
Master Carpenter,
Central Railroad and Banking Co. of Georgia.

Connecticut River Railroad Office, }
Northampton, May 4, 1850. }

E. CRANE, Esq.,
Dear Sir: It is now about two years since I first tried the experiment of using a set of Ray's India-rubber Springs upon one of our merchandise cars, and although the car has been in constant service since that time, I do not on examination find the slightest difference either in the thickness or elasticity of the material.

The same result has followed wherever we have applied them, either for wheel or draw springs on Engines, Tenders or Cars. At present we use no other; either in replacing old springs or building new cars—and I am perfectly satisfied that for economy, durability, safety, and ease of motion, that Ray's India-rubber is the best article for Springs which has been presented to the public.

Yours respectfully, **J. HUNT,**
Supt. Connecticut River Railroad.

EDWARD CRANE, Esq.,
Dear Sir: Having applied to cars of the Boston and Worcester Railroad Corporation, Ray's Vulcanised Rubber Springs (where they have been in use for some two years last past), I have had occasion to observe their operation, and am free to say in answer to your inquiries, that they retain their elasticity perfectly during all changes of atmospheric temperature; and are in my opinion a most valuable acquisition to Railroad Cars—are not liable to derangement, as is the case with steel springs; while at the same time it costs less to apply them. Respectfully yours,

D. N. PICKERING,
Supt. Motive Power, Bost. & Wor. Railroad.
Boston, April 15th, 1850.

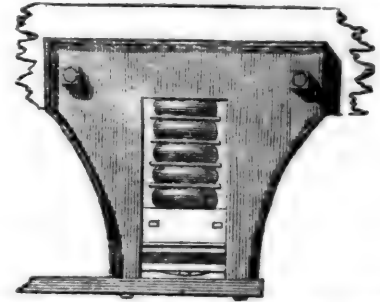
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Best Cast Steel Royal Improved Files, well known as better adapted for Engineers' and Machinists' purposes than any now in use in the United States.

Every description of Square, Octagon, Flat and Round Cast Steel, Sheet, Shovel and Railway Spring Steel, etc., and Steel to order for any purposes—manufactured at their works in Sheffield and universally known by the old stamp "Globe."

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THESE SPRINGS ARE THE CHEAPEST, the lightest and most durable of any yet known. They are easily applied to new or old cars, and there is small possibility of any accident occurring to them. Other parties through Mr. Ray set up claims to an India Rubber Spring which, though the same in principle, is very inferior in its working and durability. Actions are in progress for an Infringement on Fuller's Patent against parties using that Spring.

The superiority of Fuller's Spring over that claimed by Mr. Ray is fully established and has frequently been testified to. The following are from gentlemen who have had much experience with both Springs.

"It will afford me pleasure to recommend your springs to the companies in this region, in preference to Ray's which I am confident are inferior in mechanical arrangement to yours."
JOHN M'RAE,
Engineer S. Carolina R. R., Charleston.

"I do not hesitate to allow you to say that I concur in Mr. M' Rae's opinion that Ray's springs are inferior in mechanical arrangement to Fuller's. I repeatedly expressed that opinion long before Mr. M' Rae had seen your springs (as I believe) and entertain it still."
WM. PARKER,
Gen'l Supt. of Baltimore and Ohio R. R.

Office of Sup't Norwich & Worcester R.R. Co. }
December 25, 1849. }
"I most fully concur in the opinion of Jno. McRae, Engineer of S. Carolina Railroad, that 'Rays Springs are inferior to Fuller's Springs;' and shall with pleasure recommend them to all Railroad Companies for adoption. I have used both springs on this road and have no hesitation in saying that I should in all cases prefer Fuller's Spring."

SAM'L H. P. LEE, JR.,
Supt and Engineer.
Office B. & P. R. R. Co., }
Boston, 20th December, 1849. }
"This company have cars fitted up with both Ray's and Fuller's 'Metallic India Rubber Springs;' and I do not hesitate to say that Fuller's arrangement is very much superior to Ray's."
W. RAYMOND LEE, Supt.

The following result has been obtained by experiment upon one railroad.
A set of Trucks fitted with Steel Springs cost \$190.77 and weigh 2355 lbs. The same with Fuller's Springs, 131.71 " 1911 lbs.
Difference, \$59.06 " 444 lbs.

Not only is there an advantage in the cost, but owing to the great reduction in weight, the car can be made lighter throughout, and so an enormous saving in weight may be effected in a Train.

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CUT NAILS OF BEST QUALITY, BAR IRON
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Buckland, George,
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Clement, Wm. H.,
Little Miami Railroad, Cincinnati, Ohio.

Cozzens, W. H.,
Engineer and Surveyor, St. Louis, Mo.

Alfred W. Craven,
Chief Engineer Croton Aqueduct, New York.

Davidson, M. O.,
Eckhart Mines, Alleghany Co., Maryland.

Fisk, Charles B.,
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Fitchburgh Railroad, Boston, Mass.

Floyd-Jones, Charles,
South Oyster Bay, L. I.

Gzowski, Mr.,
St. Lawrence & Atlantic Railroad, Montreal, Canada.

Gilbert, Wm. B.,
Rutland and Burlington Railroad, Rutland, Vt.

Grant, James H.,
Nashville and Chattanooga R. R., Nashville, Tenn.

S. W. Hill,
Mining Engineer and Surveyor, Eagle River,
Lake Superior.

Holcomb, F. P.,
Southwestern Railroad, Macon, Ga.

Johnson, Edwin F.,
New York and Boston Railroad, Middletown Ct.

Latrobe, B. H.,
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Miller, J. F.,
Worcester and Nashua Railroad, Worcester, Mass.

Morris, Elwood,
Schuylkill Navigation, Schuylkill Haven, Pa.

Morton, A. C.,
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South Carolina Railroad, Charleston, S. C.

Nott, Samuel,
Lawrence and Manchester Railroad, Boston,

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East Tennessee and Georgia R. R., Cleveland, Tenn.

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Roberts, Solomon W.,
Ohio and Pennsylvania Railroad, Pittsburgh, Pa.

Sanford, C. O.,
South Side Railroad, Virginia.

Schlatter, Charles L.,
Northern Railroad (Ogdensburg), Malone, N. Y.

Sours, Peter,
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Thomson, J. Edgar.,
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Troost, Lewis,
Alabama and Tennessee Railroad, Selma, Ala.

Whipple, S.,
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On the European Plan,
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Late of the Exchange & St. Charles Hotels, Pittsburg.

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Barnum's City Hotel,
MONUMENT SQUARE, BALTIMORE.
This Extensive Establishment, erected expressly
for a Hotel, with every regard to comfort and convenience,
is situated in the centre and most fashionable part of the city,
and but a few minutes' walk from the Railroad Depots and Steamboat Landings.
The House has lately undergone a thorough repair,
embracing many valuable improvements, and will accommodate
250 Guests. BARNUM & CO.

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Are prepared to execute all kinds of Lithography
in good style and at reasonable rates. Particular
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are respectfully solicited.

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Will attend to the examination of mining tracts near
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H. A. TUCKER,
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For the Purchase and Sale of Railroad Iron (new and
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" Barston, Pope & Co., "
" Earps & Brink, Philadelphia. "
" E. Pratt & Brother, Baltimore.
John Barstow, Esq., Providence.
Lewis Bullard, Esq., Boston.
February 9, 1850. 6m*

United States Railroad Guide and Steamboat Journal.

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with much miscellaneous matter for the travelling public.
Price 12 cents a copy. Yearly subscription \$1.
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AGENT FOR
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BAILEY-LANE WORKS, SHEFFIELD,
Manufacturers of Cast, Shear, German and Blister
STEEL
Of all descriptions. Warranted Good
FILES.

Manufacturers of Machinists' Warranted Best Cast
Steel Files, expressly for working upon Iron and Steel,
made very heavy for recutting.
A full Stock of Steel and Files at all times on
hand. 6m4

Walter R. Johnson,
CIVIL AND MINING ENGINEER AND AT-
torney for Patents. Office and Laboratory, F St.,
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NO. 51 EXCHANGE PLACE,
BALTIMORE.

Agents for Avalon Railroad Iron and Nail Works.
Maryland Mining Company's Cumberland Coal 'CED'
—'Potomac' and other good brands of Pig Iron.

Cop Waste.

CLEAN COP WASTE, suitable for cleaning Rail-
road, Steamboat and Stationary Engines, con-
stantly on hand and for sale by
KENNEDY & GELSTON,
54 Pine St., New York.
October 27, 1849, 3m

**Railroad Car Manufacturer's
Furnishing Store.****F. S. & S. A. MARTINE,**

IMPORTERS AND MANUFACTURERS OF

**RAIL ROAD CAR &
CARRIAGE LININGS,**PLUSHES, CURTAIN MATERIALS, ETC.,
112 WILLIAM ST., NEAR JOHN.3-4 and 6-4 Damasks, Union and Worsted; Mo-
reens, Rattinette, Cloths, Silk and Cotton Velvets,
English Bunting**Samuel Kimber & Co.,****COMMISSION MERCHANTS**

WILLOW ST. WHARVES, PHILADELPHIA.

AGENTS for the sale of Charcoal and Anthracite

A Pig Iron, Hammered Railroad Car and Locomotive

Axles, Force Pumps of the most approved construction for Railroad Water Stations and Hydraulic

Rams, etc., etc.

July, 27, 1849.

James Herron, Civil Engineer,

OF THE UNITED STATES NAVY YARD,

PENSACOLA, FLORIDA,

PATENTEE OF THE

HERRON RAILWAY TRACK.

Models of this Track, on the most improved plans,

may be seen at the Engineer's office of the New York

and Erie Railroad.

To Railroad Companies.**—WROUGHT IRON WHEELS—**

SAFETY AND ECONOMY.

NORRIS' LOCOMOTIVE WORKS,

SCHENECTADY, NEW YORK,

Are Manufacturing Wrought Iron Driving, Truck,

Tender, and Car Wheels—made from the best American

Iron. Address E. S. NORRIS.

May 16, 1849.

George O. Robertson,**BROKER IN SCOTCH AND****AMERICAN PIG IRON;**

Bar Iron, Lead, Spelter, Tin, Copper, etc.,

No. 4 Liberty Place, MAIDEN LANE,

(Near Broadway,)

NEW YORK

Manufacture of Patent Wire**ROPE AND CABLES,**

For Inclined Planes, Suspension Bridges, Standing

Rigging, Mines, Cranes, Derrick, Tilters, &c., by

JOHN A. ROEBLING, Civil Engineer,

TRENTON, N. J.

Doremus & Harris,**ANALYTICAL & CONSULTING CHEMISTS,**

179 BROADWAY, NEW YORK.

SCHOOL OF CHEMISTRY.**To Engineers and Surveyors.**

E. BROWN AND SON Mathematical inst.

makers No. 27 Fulton Slip, New York, make and keep

for sale, Theodolites, Levelling inst., Levelling rods,

Surveyors Compasses, and Chains, Cases of Mathe-

matical drawing insts. various qualities, together with

a general assortment of Ivory Scales and small insts.

generally used by Engineers.

Ranstead, Dearborn & Co.,

MANUFACTURERS OF

LOCOMOTIVE CRANKS AND CAR AXLES,

ALSO

WROUGHT IRON SHAFTING,

And All Kinds of Hammered Shapes.

Forge at Commercial Point, Dorchester,

Office 25 Foster's Wharf, opposite No. 211 Broad St.

BOSTON.**Henry J. Ibbotson,**

IMPORTER of Sheffield and Birmingham Goods.

Also, Agent for the Manufacture of Telegraph

Wire. 218 PEARL ST., NEW YORK.

Cumberland, (Md.) Coals for**Steaming, etc.**

ORDERS RECEIVED FOR AND FILLED

by J. COWLES, 27 Wall St., N. Y.

Samuel D. Willmott,
MERCHANT, AND MANUFACTURER OF
CAST STEEL WARRANTED SAWS,
—AND FILES—
IMPORTER OF THE
GENUINE WICKESRLY GRINDSTONES
NO. 8 LIBERTY STREET,
NEW YORK.**IRON.****Railroad Iron.**3,000 TONS C. L. MAKE 63½ lbs. per yard,
now landing and to arrive.Also contracts made for future delivery of above su-
perior make English Iron.

300 Tons Banks Best Iron, Round, Square and Flat.

200 " English Bar " " " "

10 " 9-16 Square Iron for Railroad Spikes.

For sale in lots to suit purchasers by

DAVID W. WETMORE.

New York, March 26, 1850. 3m

Railroad Iron.THE Undersigned, Agents for Manufacturers, are
prepared to contract to deliver Rails of superiorquality, and of any size or pattern, to any ports of dis-
charge in the United States.

COLLINS, VOSE & CO.,

74 South St.

New York, June 1, 1850.

Railroad Iron.

1,500 Tons weighing 53 lbs. per lineal yard.

500 " " 57 " " "

500 " " 56 " " "

500 " " 60 & 61 lbs. " "

Also 2½x flat rails. All the above being of approv-

ed patterns. For sale by

DAVIS, BROOKS, & CO.,

68 Broad street.

N.B.—Rails imported on commission, or at a fixed

price.

Iron.

Pig Iron, Anthracite and Charcoal; Boiler and Flue

Iron, Spring and Blistered Steel, Nail Rods, Best Re-

fined Bar Iron, Railroad Iron, Car Axles, Nails, Stove

Castings, Cast Iron Pipes of all sizes, Railway Chairs

of approved patterns' for sale by

COLEMAN, KELTON & CAMELL,

109 N. Water St., Philadelphia.

IRONDALE PIG METAL, MANUFACTURED

and for sale by the Bloomsburg Railroad Iron Co.

LINDLEY FISHER, Treasurer.

75 N. Water St., Philadelphia.

Railroad Iron.2000 Tons, weighing 58 pounds per lineal yard,
of the most approved pattern of T rails, in

store and to arrive, for sale by

COLLINS, VOSE & CO.,

74 South St.

New York, June 1, 1850.

Railroad Iron.

1675 Tons, weighing about 61 lbs. per yard, 90

tons, weighing about 52 lbs. per yard, and

825 tons, weighing about 53½ lbs. per yard, of the lat-

est and most approved patterns of T rail, for sale by

BOORMAN, JOHNSTON & CO.,

119 Greenwich street.

New York, Feb. 25, 1850.

N.B.—E. J. & Co are also prepared to take con-

tracts for English rails, delivered in any of the Atlan-

tic ports of the United States.

Railroad Iron.THE UNDERSIGNED, HAVING made arrange-
ments abroad, are prepared to contract for the de-

livery of Foreign rails, of approved brands upon the

most favorable terms.

They will also make contracts for American rails,

made at their Trenton works, from Andover Iron, in

whole or in part, as may be agreed upon.

They are prepared to furnish Telegraph, Spring and

Market Wire; Braziers and Wire Rods; Rivets and

Merchant Bars to order, all made exclusively from And-

over Iron. The attention of parties who require iron

of the very best quality for special purposes, is respect-

fully invited.

COOPER & HEWITT,

17 Burling Slip, New York.

February 15, 1850.

Glendon Refined Iron.Round Iron, Band Iron, Hoop Iron,
Square " Flat " Scroll "

Axles, Locomotive Tyres,

Manufactured at the Glendon Mills, East Boston, for

sale by GEORGE GARDNER & CO.,

5 Liberty Square, Boston, Mass.

Sept. 15, 1849. 3m37

PATENT HAMMERED RAILROAD, SHIP &**BOAT SPIKES.**—The Albany Iron Works

have always on hand, of their own manufacture, a

large assortment of Railroad, Ship and Boat Spikes

from 2 to 12 inches in length, and of any form of head

From the excellence of the material always used in

their manufacture, and their very general use for rail-

roads and other purposes in this country, the manu-

facturers have no hesitation in warranting them fully

equal to the best spikes in market, both as to quality

and appearance. All orders addressed to the subscrib-

ers at the works will be promptly executed.

JOHN F. WINSLOW, Agent.

Albany Iron and Nail Works, Troy, N. Y.

The above Spikes may be had at factory prices, of

Erastus Corning & Co Albany; Menitt & Co., New

York; E. Pratt & Br. 1st, Ea. Timore Md

**LAP—WELDED
WROUGHT IRON TUBES**

FOR

TUBULAR BOILERS,

FROM ONE AND A QUARTER TO SEVEN

INCHES IN DIAMETER.

THE ONLY Tubes of the same quality and man-
ufacture as those so extensively used in England,

Scotland, France and Germany, for Locomotive, Ma-

rine and other Steam Engine Boilers.

THOMAS PROSSER & SON, Patentees,

28 Platt street, New York.

Railroad Iron.THE UNDERSIGNED ARE PREPARED TO
contract for the delivery of English Railroad Iron

of favorite brands, during the Spring. They also re-

ceive orders for the importation of Pig, Bar, Sheet, etc.

Iron. THOMAS B. SANDS & CO.,

22 South William street,

February 3, 1849. New York.

Iron Store.THE Subscribers, having the selling agency of the
following named Rolling Mills, viz: Norristown,

Rough and Ready, Kensington, Triadelphia, Potts-

grove and Thorndale, can supply Railroad Companies,

Merchants and others, at the wholesale mill prices for

bars of all sizes, sheets cut to order as large as 58 in.

diameter; Railroad Iron, domestic and foreign; Loco-

motive tire welded to given size; Chairs and Spikes;

Iron for shafting, locomotive and general machinery

purposes; Cast, Shear, Blister and Spring Steel; Bol-

ter rivets; Copper; Pig Iron, etc., etc.

MORRIS, JONES & CO.,

Iron Merchants,

Schuylkill 7th and Market Sts., Philadelphia.

August 16, 1849. 1y33

Railroad Iron.THE MOUNT SAVAGE IRON WORKS, AL-
legany county, Maryland, having recently pass-

ed into the hands of new proprietors, are now prepar-

ed, with increased facilities, to execute orders for any

of the various patterns of Railroad Iron. Commu-

nications addressed to either of the subscribers will have

prompt attention. J. F. WINSLOW, President

Troy, N. Y.

ERASTUS CORNING, Albany

WARREN DELANO, Jr., N. Y.

JOHN M. FORBES, Boston.

ENOCH PRATT, Baltimore, Md.

November 6, 1848.

Railroad Iron.THE SUBSCRIBERS ARE PREPARED TO
take orders for Railroad Iron to be made at their

Phoenix Iron Works, situated on the Schuylkill Riv-

er, near this city, and at their Safe Harbor Iron Works,

situated in Lancaster County, on the Susquehanna

river; which two establishments are now turning out

upwards of 1800 tons of finished rails per month.

Companies desirous of contracting will be promptly

supplied with rails of any required pattern, and of the

very best quality.

REEVES, BUCK & CO.

45 North Water St. Philadelphia,

March 15, 1849.

Monument Foundry.

A. & W. DENMEAD & SON,
Corner of North and Monument Sts.,—Baltimore,

HAVING THEIR

IRON FOUNDRY AND MACHINE SHOP

In complete operation, are prepared to execute faithfully and promptly, orders for Locomotive or Stationary Steam Engines, Woolen, Cotton, Flour, Rice, Sugar Grist, or Saw Mills, Slide, Hand or Chuck Lathes, Machinery for cutting all kinds of Gearing. Hydraulic, Tobacco and other Presses, Car and Locomotive patent Ring Wheels, warranted,

Bridge and Mill Castings of every description, Gas and Water Pipes of all sizes, warranted, Railroad Wheels with best faggotted axle, furnished and fitted up for use, complete

Being provided with Heavy Lathes for Boring and Turning Screws, Cylinders, etc., we can furnish them of any pitch, length or pattern.

Old Machinery Renewed or Repaired—and Estimates for Work in any part of the United States furnished at short notice.

June 8, 1849.

Iron Wire.

REFINED IRON WIRE OF ALL KINDS,
Card, Reed, Cotton-flyer, Annealed, Broom, Buckle, and Spring Wire. Also all kinds of Round, Flat or Oval Wire, best adapted to various machine purposes, annealed and tempered, straightened and cut any length, manufactured and sold by

ICHABOD WASHBURN.

Worcester, Mass., May 25, 1849.

Wheel, Forge and Foundry Iron.

LOCUST GROVE Wheel Iron of great strength and superior chilling property.

Balt. Charcoal Forge Iron, from Patuxent, Curtis Creek and Gunpowder furnaces.

Elkridge Foundry Iron, of superior strength and softness. Anthracite and Charcoal Iron from Pennsylvania and Virginia. Gas and Water Pipes, Lamp Posts from Elkridge furnace.

LEMMON & GLENN,

6m9 62 Buchanan's Wharf, Baltimore.

S. S. Keyser & Co., IRON WAREHOUSE,

Corner of South and Pratt Streets, BALTIMORE, MD.

Selling Agents for the Rough and Ready Bar Iron and Elk Boiler and Blue Iron Rolling Mills, Sarah and Taylor Furnaces, and Wrightsville Hollow Ware Foundry, and Dealers in Bar and Sheet Iron, and Cast, Sheer, German, Blister, Spring and Electroplated Steel, etc., etc.

Smith & Tyson,

GENERAL COMMISSION MERCHANTS,
No. 25 South Charles St., Baltimore, Md.

AGENTS for the Celebrated Columbia Pig Iron, suitable for Car Wheels and Chilled Rolls.

Columbia refined Charcoal Blooms; Refined Charcoal Juniata Billet Iron for Wire; Refined Iron for Bridging, of great strength; Cut Nails, Spikes, and Brads; Railroad Spikes and Wrought Chairs. 22tf

Stickney & Beatty,

DEALERS IN IRON AND IRON MANUFACTURERS.

AGENTS for the Balt. City Rolling Mill, from which establishment they are prepared to furnish Ellicott's round, square, and flat bar iron, puddled and charcoal boiler plates and billet iron—also agents for the sale of the Laurel and Maryland (Balt.) charcoal forge pig iron, Balt. hard iron for chilling wheels, anti-fatam nails, Catoctin foundry iron, boiler blooms from the Caledonian works, Wm. Jessop & Son's cast steel, Coleman's blister steel and nail rods, hoop, band, sheet, oval and common English iron.

Nos. 18 and 20 South Charles st., Baltimore.

Railroad Iron.

CONTRACTS made by the subscribers, agents for the manufacturers, for the delivery of Railway Iron, at any port in the United States, at fixed prices, and of quality tried and approved for many years, on the oldest railways in this country.

RAYMOND & FULLERTON, 45 Cliff st.

Iron.

THE SUBSCRIBERS having resumed the agency of the New-Jersey Iron Company, are prepared to execute orders for the different kinds and sizes of iron usually made at the works of the company, and offer for sale on advantageous terms.—

150 tons No. 1 Boonton Foundry Pig Iron.

100 " No. 2 do. do. do.

300 " Nos. 2 & 3 Forge do. do.

100 " No. 2 Glendon do. do.

140 " Nos. 2 & 3 Lehigh Crane do. do.

100 " No. 1 Pompton Charcoal do. do.

100 " New-Jersey Blooms

50 " New-Jersey Faggotted Iron, for shafts

Best Bars, $\frac{1}{2}$ to 4 inch by $\frac{1}{2}$ to 1 inch thick.

Do. do. Rounds and Squares, $\frac{1}{2}$ to 3 inch.

Rounds and Squares, 3-16 to 1 inch.

Half Rounds, $\frac{1}{2}$ to 1 in. Ovals & Half Ovals $\frac{1}{2}$ to 1 $\frac{1}{2}$ in.

Bands, $\frac{1}{2}$ to 4 inch. Hoops, $\frac{1}{2}$ to 2 inch.

Trunk Hoops, $\frac{1}{2}$ to 1 $\frac{1}{2}$ in. Horse Shoe & Nut Iron.

Nail Plates. Railroad Spikes.

DUDLEY B. FULLER & Co., 139 Greenwich-

st. and 85 Broad-st.

WILLIAM JESSOP & SONS' CELEBRATED CAST-STEEL.

The subscribers have on hand, and are constantly receiving from their manufactory.

PARK WORKS, SHEFFIELD,

Double Refined Cast Steel—square, flat and octagon.

Best warranted Cast Steel—square, flat and octagon.

Best double and single Shear Steel—warranted.

Machinery Steel—round.

Best and 2d gy. Sheet Steel—for saws and other purposes.

German Steel—flat and square, "W. I. & S." "Eagle"

and "Goat" stamps.

Genuine "Sykes," L. Blister Steel.

Best English Blister Steel, etc., etc., etc.

All of which are offered for sale on the most favorable terms by

WM. JESSOP & SONS,

91 John street, New York.

Also by their Agents—

Curtis & Hand, 47 Commerce street, Philadelphia.

Alex'r Fullerton & Co., 119 Milk street, Boston.

Stickney & Beatty, South Charles street, Baltimore.

May 6, 1848.

JOHNSON, CAMMELL & Co's Celebrated Cast Steel,

ENGINEERING AND MACHINE FILES,
which for quality and adaptation to mechanical uses, have been proved superior to any in the United States. Every description of square, octagon, flat and round cast steel, sheet, shovel and railway spring steel, best double and single shear steel, German steel, flat and square, goat stamps, etc. Saw and file steel, and steel to order for any purposes, manufactured at their Cyclops Steel Works Sheffield.

JOHNSON, CAMMELL & CO.,

100 William St., New York.

November 23 1849.

Railroad Iron.

THE Undersigned, Agents for Manufacturers, are prepared to contract for the delivery of English, Welsh and Scotch Rails, of any pattern and weight, also for every description of Welsh, Scotch and Swedish Iron, Railway Chairs and Spikes, Rivets, Bolts, Nuts, Washers, Chain Cables, Anchors, Tin Plates, German Spelter, Iron Castings, and every description of Machinery.

WILLIAM BIRD & CO.,

Iron and Tin Plate Merchants,

44 Wall st., New York.

And at 5 Martin's Lane, London,

and 140 Buchanan st., Glasgow.

July 27th, 1850.

To the Proprietors of Rolling Mills and Iron Works.

THE Undersigned—Proprietors of Townsend's Furnace and Machine Shop, Albany—are extensively engaged in the manufacture of Machinery and fixtures for Iron, and Copper Rolling Mills, and Iron Works. Having paid particular attention to the manufacture of *Rolls* (Rollers), both *chilled and dry-sand*, they feel confident that they can execute orders for such castings in a satisfactory manner. And to give assurance of this, they beg leave to refer to the following named persons, proprietors and managers of some of the most extensive rolling mills in the country, viz: Jno. F. Winslow, J. Tuckerman, H. Burden, W. Burt, J. & J. Rogers, Saltus & Co., J. B. Bailey, L. G. B. Cannon, Hawkins & Atwater, etc., etc.

F. & T. TOWNSEND.

Albany, August 18, 1849,

Railroad Iron.

B. O. Railway Tires, Railway Wheels,
Scotch Pig Iron, Tin Plates and Banca Tin,
Muntz's Patent Metal Sheathing,
Baltimore Copper.

Contracts for Rails made on behalf of the manufacturers, for delivery at any ports in the United States, at fixed prices.

Bowling Tires and Tire Bars and Scotch Pigs imported to order.

Muntz's Ship-sheathing, and a general stock of Tin Plates and Banca Tin in store, and for sale by
RAYMOND & FULLERTON, 45 Cliff st.

Bowling Iron. Stamped B.O.

Railway Tire Bars, Rivet Iron
Locomotive and other Axles, Locomotive Frame do
Boiler Plates, Bars,
and every other description of this superior Iron.

The subscribers, agents for the sale of Bowling Iron, are prepared to execute orders for importation, especially for railway and machinery uses, with despatch from the manufacturers.

RAYMOND & FULLERTON, 45 Cliff st.

Lovegrove's Patent Cast Iron Water and Gas Pipes.

THE Subscriber, the Inventor and Patentee of the Centrifugal mode of giving form to metallic substances while in a molten state, is preparing to make Cast Iron Water and Gas Pipes, of any dimensions, at prices much lower than they can be made in the old manner, and the pipes warranted to stand a pressure of three hundred pounds to the square inch, and to be soft enough to drill. Steam Engines and all kinds of machinery. Cast Iron Doors and Frames, and Mill Castings of every description, made to order.

THOMAS LOVEGROVE,

Machinist and Founder,

West Falls Avenue, below Pratt st., Baltimore.

Rosendale Cement.

THE NEWARK AND ROSENDALE LIME AND CEMENT CO. are now manufacturing at their works in NEWARK, N. J., and Ulster county, N. Y., a very superior article of *Hydraulic Cement*—also Lime Calcine Plaster, etc. Contractors and dealers will find it to their advantage to call or make application before purchasing elsewhere. All communications addressed to the subscriber, at Newark, N. J., will be punctually attended to.

1y*15

HENRY WILDE, Secretary.

Railroad Instruments.

THEODOLITES, TRANSIT COMPASSES, and Levels, with Fraunhoffer's Munich Glasses, Surveyor's Compasses, Chains, Drawing Instruments, Barometers, etc., all of the best quality and workmanship, for sale at unusually low prices, by

E. & G. W. BLUNT,

No. 179 Water St., cor. Burling Slip.

New York, May 19, 1849.

American Railway Guide, AND POCKET COMPANION FOR THE UNITED STATES;

CONTAINING Correct Tables, showing the time for starting of trains from all stations, distances, fares, etc., on all the Railway lines in the U. States; also many of the principal Steamboat and Stage routes—accompanied by a complete **RAILWAY MAP**. Price, single copies 12 $\frac{1}{2}$ cts., or \$1 per annum. Published on the first of every month, corrected from returns furnished by the Railway Superintendents throughout the Union.

This book has been compiled somewhat on the plan of Bradshaw's Guide, with such improvements in size, form and arrangement as have seemed desirable; and the publisher confidently hopes it will not be found liable to the objections of incompleteness and incorrectness, which have been made, and justly too, against various other similar works heretofore issued.

The subscriber having had the management of the **NEW YORK PATHFINDER** almost from its commencement, has enjoyed superior facilities in obtaining information relating to the thoroughfares of travel, and is therefore well qualified to prosecute with success the arduous undertaking of furnishing a complete and correct national guide book.

STRINGER & TOWNSEND, General Agents, 222 Broadway: and sold also by Booksellers and Periodical Dealers generally throughout the country; also on all the Railways and Steamboats.

CURRAN DINSMORE, Publisher,

N. Y. Pathfinder Office,
138 Fulton St., New York City. }

Great American Engineering

AND MECHANICAL WORK, just published in medium folio, 75 cts. to Subscribers, One Dollar to non-subscribers.

Part VI of "Specimens of the Stone, Iron and Timber Bridges, Viaducts, Tunnels, &c. &c. of the United States Railroads." By George Duggan, Architect and Civil Engineer.

The present part contains beautifully executed plans, elevations and sections of the Timber Bridge (three spans of 150, and one span of 160 feet) across the Delaware at Saw Mill Rift, on the line of the N. York & Erie R. R., with the specifications, estimates, bills of timber, iron, etc.

N. B.—With the present (6th) part, are given specimen Plates of the APPENDIX, (or "THEORETICAL AND PRACTICAL TREATISE ON BRIDGE BUILDING, etc. etc.") consisting of plans, elevations, sections and details of a cast iron oblique arch, 130 feet span, across Fairfield st. Manchester, on the line of the Manchester and Birmingham Railroad. Also a specimen sheet of the letter press of the APPENDIX, consisting of an introductory article on the Application of Iron to Railroad Structures.

"It is a work that was a great desideratum, and must prove of great benefit to the engineering profession generally, and especially to the tyro in practical engineering and mechanical knowledge; in truth it strikes us, that it would require years of labor and patient toil on the part of a young engineer to prepare the drawings, and collect the information that will be embodied in this work, and can now be secured for the trifling sum of \$9."—(Scientific Amer. March 16, 1850.)

In connection with this subject (Iron Railroad Structures) we take occasion to call attention again to Mr. Duggan's valuable and expensive publication, exhibiting drawings, with full descriptions of the various stone, iron and wooden bridges, viaducts, tunnels, culverts, etc., of all the Railroads in the United States. Mr. Duggan is an accomplished Architect and Civil Engineer, who came from Ireland to it is country to exercise his profession; but finding Railroad construction here, in many respects, different from that he had been accustomed to in Europe, he applied himself to the study of our system; and the fruits of his researches and investigations embodied in this work, are well calculated to meet the exigencies of engineers, and to assist draughtsmen, bridge builders, mechanics and students.—[N. Y. Journal of Commerce, Feb. 14, 1850.]

Published by **GEORGE DUGGAN,**
300 Broadway, New York.
To whom all communications should be addressed,
and subscriptions forwarded.

FWLER M. RAY'S **Patent India-rubber Railroad** **CAR SPRING.**

New York and Erie Railroad Shops,
Piermont, March 26, 1850.

This will certify that from practical experience in the use of Fowler M. Ray's India rubber Car Springs, I believe them to be far superior to any others now in use.

I have never known them to be affected by any change of temperature, as other Rubber Springs have been affected on this road.

I am at the present time repairing a Passenger Car that Mr. Ray and myself mounted with his springs about two years and eight months since.

The springs are at the present time as perfect, to all appearances, as when first applied to the car.

Respectfully yours,

HORACE B. GARDNER,
Foreman of the Car Shops.

Supt. Office N.Y. & H. R.R.,
New York, March 8, 1850.

This is to certify that we have used the Rubber Springs manufactured by Mr. F. M. Ray for the past twenty months, "both for Passenger and Freight Car Springs and Bumpers, and of different sizes" and have in every case given entire satisfaction, and I consider them the best spring now in use.

M. SLOAT, Supt.

Boston, March 5, 1850.

In answer to your enquiry about India-rubber Springs, I have to say that we have used them to a considerable extent on both freight and passenger cars, and also on several of our tenders; and I am very well satisfied that they answer all the purposes for which they are intended. I believe the India-rubber will soon supersede all other springs for cars and tenders.

Yours truly,
S. M. FELTON,
Supt. Fitchburg Railroad.

Office New Jersey Railroad Co.,
Jersey City, March 8, 1850.

FWLER M. RAY, Esq.,

Dear Sir: In answer to your enquiries respecting the operation of the Vulcanised Rubber Springs, purchased by our company from you some two years since, I reply that they are superior to any spring in use, (that I have either seen or heard of).

The improved form of your spring, consisting of a solid piece of vulcanised rubber with bands on the outside, is far superior to your first form, consisting of disks of rubber with metallic plates interposed.

The last named form was tried, if you recollect, at a much earlier period; and then was replaced by your last form.

I have no hesitation in saying that your springs have given entire satisfaction, and most cheerfully recommend them to railroad companies throughout the country for the following reasons:

- 1st. The cost is 30 per cent. less.
- 2d. Saving of weight on each car of 8 wheels from 700 to 800 lbs.
- 3d. Less care and attention is required, as they are not liable to get out of repair.
- 4th. A great saving is secured in the wear and tear of the cars and rails from their great elasticity.
- 5th. The freedom from noise.
- 6th. There is greater safety in case of accident, as they cannot be broken.
- 7th. The comfort of passengers is enhanced sufficiently to pay the expense, waiving all the other reasons that I have given.

Should this fail to satisfy any person enquiring, you are at liberty to refer to me, No. 150 Washington St., Jersey City.

Yours respectfully,
T. L. SMITH, Supt.

New York, March 11, 1850.

I have used the Patent India-rubber Spring purchased of Mr. Ray, upon the cars of the New York and New Haven Railroad, and have found them efficient and economical; and when applied to the axles and draw springs, believe them to be quite equal to any in use. I have found a combination of these springs with a steel spring under the transom beam a very satisfactory arrangement, and am now using this plan in all new cars.

Yours respectfully,
ROBERT SCHUYLER.

February 25, 1850.

From practical observation of the use of the India-rubber Car Springs, manufactured and sold by your company, we are entirely satisfied in their application, and do not hesitate to recommend them as elastic, durable, requiring no repairs for years, and retaining their consistency during all extremes of weather. We have applied them for the past two years, and consider them superior for all railroad purposes.

Yours truly,
OSGOOD BRADLEY, Car Builder, Worcester.
T. & C. WASON, do, Springfield.
DEAN, PACKARD & MILLS, do, do.
DAVENPORT & BRIDGES, do, Cambridgeport.

Office of the New Jersey Railroad Co.,
Jersey City, March 7, 1850.

This is to certify that we have had Mr. F. M. Ray's India-rubber Springs in constant use under our cars, and as Bumper Springs for upwards of two years, and they have in every way given perfect satisfaction.

The present form of spring we deem far superior to the form of Disk, having used both forms, although we have none of those made in Disks at present in use.

We take pleasure in recommending these springs to all railroad companies.

J. P. JACKSON, Vice Prest.
New Jersey Railroad and Trans. Co.

Roxbury, February 23, 1850.

In compliance with your request, I take great pleasure in stating the result of my experience in the use of "Ray's Patented Vulcanised India-rubber Car and Engine Springs." We have used them nearly two years, and never had one fail in any way. The cold weather does not affect them, as it has other rubber springs we have used.

With sixteen years' experience as superintendent of machinery on the Boston and Providence railroad, I take pleasure in saying that your springs are the best we ever used, or I ever saw used elsewhere. We have 20 cars rigged with them, of which I can say that the springs are as good now as when first applied. I put 24 lbs. of the rubber under the forward end of one of our heaviest engines, taking off 250 lbs. of steel springs—it has been in use 18 months, and is in as good condition now as when first put under the engine.

Very respectfully yours,

GEO. S. GRIGGS,
Supt. of Machinery, Boston and Prov. R.R.

Fall River, February 2, 1850.

In answer to yours of the 20th ult. I would say that this company has for some 10 or 12 months past been using "Ray's India-rubber Springs." We have applied them to both passenger and freight cars with uniform success. They have invariably preserved their elasticity and consistency through all the extremes of weather; and we are now applying them whenever the steel spring fails. I am well satisfied that they are particularly adapted for railroad purposes.

Very respectfully yours,

GEO. HAVEN,
Supt. Fall River Railroad.

Jersey City, March 9, 1850.

This is to certify that the present form of Mr. F. M. Ray's India-rubber Car Spring I consider far superior to the form of Disk, having used both forms.

I take pleasure in recommending these springs to all railroad companies.
DAVID H. BAKER,
Foreman of Car Shop of N.J. R.R. & Trans. Co.

Harlem R.R. Depot,
New York, March 7, 1850.

This is to certify that we have used Mr. F. M. Ray's India-rubber Springs for over eighteen months, and find them to be easy and durable, and recommend them to railroad companies as being superior to anything we have tried.

J. M. SMART,

Foreman at 42d St. Depot.

Old Colony Railroad Office,
Boston, March 6, 1850.

EDWARD CRANE, Esq.,

President New England Car Co.,

Dear Sir: In compliance with your request I would state that the Old Colony Railroad Company have had in use upon their road, India-rubber Springs furnished by your company, for more than eighteen months past, during which time they have been extensively used under Passenger and Freight Cars, Locomotive Tenders, and for Drawer and Buffering Springs, with the most perfect success. The elasticity and consistency of the Rubber has never been unfavorably affected by either extremes of heat or cold—and from the experience which we have had in the use of Rubber Springs, I think them well adapted for railroad purposes—and therefore we have for some months past used Rubber almost exclusively, in all places where springs are required.

Respectfully yours, etc.,

JAS. H. MOORE,
Supt. O. C. Road.

Troy, February 27, 1850.

We have been using your India-rubber Car Springs for nearly two years—and we take pleasure in saying that in our opinion the rubber has to a certain extent already, and may eventually entirely supersede all other Springs for Railroad Car purposes. We now use it entirely for Draw Springs and Bumpers, considering it better and lighter than steel.

During our two years' experience in the use of it, we have not known any to lose their elasticity, or fail in any way; and we cheerfully recommend the rubber for railroad car springs. Very respectfully,
EATON, GILBERT & CO.

Passenger Car Linings.

THE Advertiser continues to make to order the Enamelled Car Linings which have been so highly approved the last three years, and are now exclusively used by all the Northern Railroads. No pains are spared to get out new styles, and adapt them to the tastes of every consumer.

Orders addressed to **CHARLES STODDER,** No. 75 Kilby street, Boston, will have prompt attention.
March 23, 1850. 2m

India-rubber for Railroad Cos.

RUBBER SPRINGS—Bearing and Buffer—Fowler's Patent—Hose from 1 to 12 inches diameter. Suction Hose. Steam Packing—from 1-16 to 2 in. thick. Rubber and Gutta Percha Bands. These articles are all warranted to give satisfaction, made under Tyer & Helm's patent, issued January, 1849.—No lead used in the composition. Will stand much higher heat than that called "Goodyear's," and is in all respects better than any in use. Proprietors of railroads do not be overcharged by pretenders.

HORACE H. DAY,
Warehouse 23 Courtlandt street.

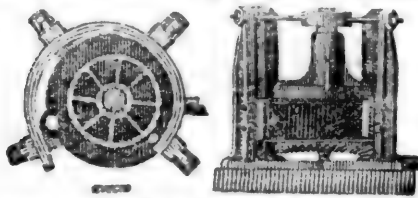
New York, May 21, 1849.

Spikes, Spikes, Spikes.

ANY person wishing a simple and effective Spike Machine, or a number of them, may be supplied by addressing
J. W. FLACK,
March 6, 1850. Troy, N. Y.

MACHINERY.

Henry Burden's Patent Revolving Shingling Machine.



THE Subscriber having recently purchased the right of this machine for the United States, now offers to make transfers of the right to run said machine, or sell to those who may be desirous to purchase the right for one or more of the States.

This machine is now in successful operation in ten or twelve iron works in and about the vicinity of Pittsburgh, also at Phoenixville and Reading, Pa., Covington Iron Works, Md., Troy Rolling Mills, and Troy Iron and Nail Factory, Troy, N. Y., where it has given universal satisfaction.

Its advantages over the ordinary Forge Hammer are numerous: considerable saving in first cost; saving in power; the entire saving of shingler's, or hammerman's wages, as no attendance whatever is necessary, it being entirely self-acting; saving in time from the quantity of work done, as one machine is capable of working the iron from sixty puddling furnaces; saving of waste, as nothing but the scoria is thrown off, and that most effectually; saving of staffs, as none are used or required. The time required to furnish a bloom being only about six seconds, the scoria has no time to set, consequently is got rid of much easier than when allowed to congeal as under the hammer. The iron being discharged from the machine so hot, rolls better and is much easier on the rollers and machinery. The bars roll sounder, and are much better finished. The subscriber feels confident that persons who will examine for themselves the machinery in operation, will find it possesses more advantages than have been enumerated. For further particulars address the subscriber at Troy, N. Y. P. A. BURDEN.

Railroad Spikes and Wrought Iron Fastenings.

THE TROY IRON AND NAIL FACTORY, exclusive owner of all Henry Burden's Patented Machinery for making Spikes, have facilities for manufacturing large quantities upon short notice, and of a quality unsurpassed.

Wrought Iron Chairs, Clamps, Keys and Bolts for Railroad fastenings, also made to order. A full assortment of Ship and Boat Spikes always on hand.

All orders addressed to the Agent at the Factory will receive immediate attention.

P. A. BURDEN, Agent,
Troy Iron and Nail Factory, Troy, N. Y.

CHILLED RAILROAD WHEELS.—THE UNDERSIGNED are now prepared to manufacture their Improved Corrugated Car Wheels, or Wheels with any form of spokes or discs, by a new process which prevents all strain on the metal, such as is produced in all other chilled wheels, by the manner of casting and cooling. By this new method of manufacture, the hubs of all kinds of wheels may be made whole—that is, without dividing them into sections—thus rendering the expense of banding unnecessary; and the wheels subjected to this process will be much stronger than those of the same size and weight, when made in the ordinary way.

A. WHITNEY & SON,
Willow St., below 13th,
Philadelphia, Pa.

Brown's Old Established SCALE WARE HOUSE,

NO. 234 WATER ST., NEW YORK.

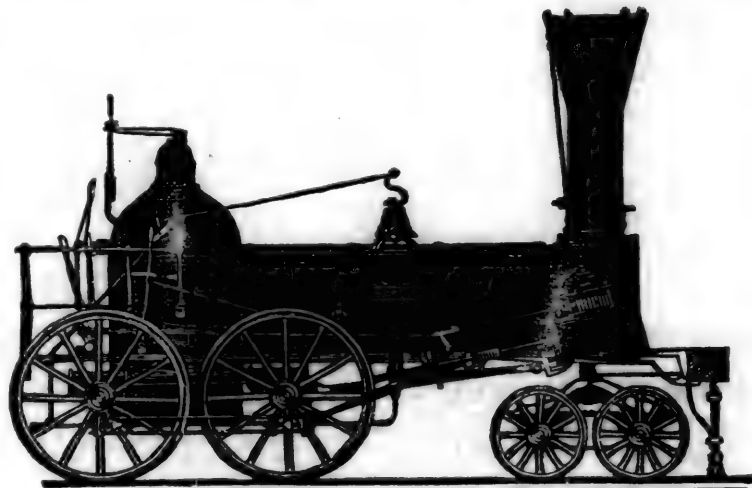
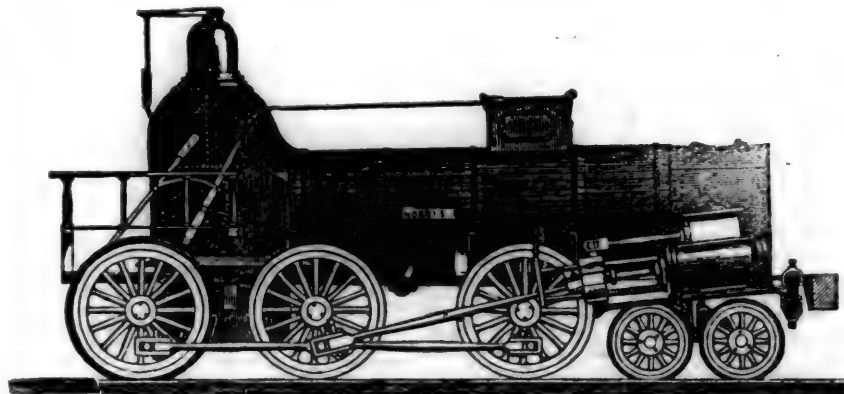
THE Subscriber, Practical Manufacturer of Scales of every description, respectfully asks the attention of Railroad Companies to his Improved Wrought Iron Railroad Track and Depot Scales which for strength, durability, accuracy, convenience in weighing, and beauty of workmanship, are not surpassed by any others in this country.

He is aware that this is rather a bold assertion for him to make, yet he can say with confidence that they have but to be tried to give them precedence over all others.

J. L. BROWN.

Bank Scales made to order, and all Scales of his make Warranted in every particular.

References given if required.

NORRIS' LOCOMOTIVE WORKS.
BUSHHILL, SCHUYLKILL SIXTH-ST., PHILADELPHIA,

THE UNDERSIGNED Manufacture to order Locomotive Steam Engines of any plan or size. Their shops being enlarged, and their arrangements considerably extended to facilitate the speedy execution of work in this branch, they can offer to Railway Companies unusual advantages for prompt delivery of Machinery of superior workmanship and finish.

Connected with the Locomotive business, they are also prepared to furnish, at short notice, Chilled Wheels for Cars of superior quality.

Wrought Iron Tyres made of any required size—the exact diameter of the Wheel Centre, being given, the Tyres are made to fit on same without the necessity of turning out inside.

Iron and Brass castings, Axles, etc., fitted up complete with Trucks or otherwise.

NORRIS, BROTHERS

PATENT MACHINE MADE HORSE-SHOES.

The Troy Iron and Nail Factory have always on hand a general assortment of Horse Shoes, made from Refined American Iron.

Four sizes being made, it will be well for those ordering to remember that the size of the shoe increases as the numbers—No. 1 being the smallest.

P. A. BURDEN, Agent,
Troy Iron and Nail Factory, Troy, N. Y.

Etna Safety Fuse.

THIS superior article for igniting the charge in wet or dry blasting, made with DUPONT'S best powder, is kept for sale at the office and depot of

REYNOLDS & BROTHER,

Sole Manufacturers,

No. 85 Liberty St.

NEW YORK.

And in the principal cities and towns in the U. States. The Premium of the AMERICAN INSTITUTE was awarded to the Etna Safety Fuse at the late Fair held in this city.

November 3, 1849.

COLUMBUS, OHIO,
Railroad Car Manufactory.
RIDGWAYS & KIMBALL,

HAVE established at this central point, the manufacture of Passenger, Freight, Gravel and Hand Cars for Railroads, and assure all Western Railroad Companies that it will be their constant aim to procure the best materials and workmen, and to turn out the best kind of work at fair prices. Specimens may be seen on the Columbus and Xenia Railroad. The patronage of Railroad Companies is respectfully solicited.

1y8

To Inventors and Patentees.

OWEN G. WARREN, ARCHITECT, Has had many years' experience as Agent for obtaining Patents, both in this country and Europe, and will transact such business promptly and reasonably. Persons at a distance can have their business done by correspondence—without the necessity of visiting this city or Washington. Office No. 94 Merchants Exchange, Wall st., corner of Hanover st., up stairs.

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AMERICAN RAILROAD JOURNAL.

STEAM NAVIGATION, COMMERCE, MINING, MANUFACTURES.

HENRY V. POOR, Editor.

ESTABLISHED 1831.

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GEN. CHAS. T. JAMES, *For Manufactures and the
Mechanic Arts.*
M. BUTT HEWSON, C. E., *For Civil Engineering.*

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American Railroad Journal.

PUBLISHED BY J. H. SCHULTZ & Co., 136 NASSAU ST.

Saturday, August 10, 1850.

English Iron Manufacture.

We copy below the following very interesting statistics from the "Documents relative to Iron manufacture in Pennsylvania," of the progress of the English iron manufacture from the earliest date to the present time. These statistics were compiled with great care and labor from authentic sources, and may be relied upon as correct. We cannot, we believe, give anything more interesting and useful to our readers than the progress of this stupendous branch of English national industry:—

1661. A petition was presented to the House of Commons, praying that a duty might be laid on iron; but the House refused to grant it.

1679. The first duty was laid upon iron of 10s per ton.

1710. The duty on iron imported in English vessels was £3 1s 6d per ton. The duty on iron imported in foreign vessels was £2 10s 10d per ton. The duty on iron imported, made in Ireland, was £1 per ton.

1740. There were 59 furnaces, producing 17,350 tons of iron per annum, or 294 tons each furnace; equal to 5½ tons a week to each furnace. Up to this time, all the iron was made with charcoal.

1750. An act of parliament was passed to en-

courage the importation of Pig iron from the colonies, by taking off the duty of 3s 9d, which had been heretofore levied on colonial pigs, the same as foreign iron. This was agreed to by the iron masters, owing to the scarcity of charcoal, and it was argued, that, as the country could afford no more charcoal for additional furnaces, they must either gradually abandon the manufacture, or take off the duty, and keep their charcoal for refining or manufacturing those pigs into bars, chains, and all finer articles; and, for that reason, the act also provided that no mill, or other engine, for slitting or rolling iron, or any plating forge to work with a tilt hammer, or any furnace for making steel, should be erected in the colonies, and those already erected should not be carried on.

The imports of American iron into Great Britain had averaged, for the previous ten years, 2,360 tons per year, and regularly increased until 1771, when they reached 7,525 tons, being rather more than 1-6 the total import of all kinds of iron into England at that time.

We add the copy of a letter from the officers of his Majesty's Dock Yard at Woolwich, to the Navy Board, dated September 31, 1735:—"We have lately received from his Majesty's yard at Deptford, barr iron flats, of two and a quarter inches broad, and half an inch thick, 15cwt 0qr 4lbs; squares of seven-eighths of an inch, 5cwt 0qr 12lbs, imported by Mrs. Cowley, from America; and, pursuant to your warrant of the 11th July, 1735, have made sufficient trial of each of the sorts, find the said iron to be very good, and fit for his Majesty's service—superior in every respect to the best Swede's iron, and, in our opinion, worth £17 10s 6d per tun."

1760. Cast iron blowing cylinders were first used.

1769. Watt's first patent taken out for improvements in the steam engine.

1775. Partnership of Boulton & Watt formed, and steam engines applied to pumping mines, and to the manufacture of iron.

1782. Duty on iron raised to £2 16s 2d, being an increase of 14s 8d.

1783. Mr. Cort invented the process of puddling, and, consequently, the substitution of mineral coal for charcoal in the manufacture of bar iron.

1784. He invented the Rolling Mill.

The price of iron for a long period previous to this time had been pretty steady at from £17 to £18.

From this time should be dated the commencement of the present English iron manufacture, as the preceding 24 years embrace all the inventions now in common use—inventions which entirely revolutionized the old system of making iron: and to which England owes the extent and cheapness of her manufacture at the present day. And from this time, also, is to be dated the commencement of her system of protection to her own manufactures and prohibition to all others, by which the

domestic competition in 41 years enabled her to manufacture iron at prices defying all rivalry, when she throws open her ports and proclaims free trade or free competition, when the fact of her exporting iron to every kingdom in the world demonstrated that nobody could compete with her.

1785. It was prohibited to export any tools, engines, models or plans of machines used in the manufacture of iron, under a penalty of one year's imprisonment, £200 fine, and the confiscation of the articles shipped, or intended to be shipped. The same fine of £200 to be inflicted on the master of the vessel. And on the custom house officers, who were to be dismissed, and forever to be incapable of holding any office under his Majesty. For enticing a workman, the penalty was one year's imprisonment and £500 fine for every workman so enticed; fine to be doubled on the second offence.

1787. The preceding act amended so as to allow tools used in the iron manufacture to be exported to the West India colonies, except Rollers, plain or grooved, and all other tools and utensils relating to the Rolling or Slitting mills, the punching of iron or casting of cannon. The importation of iron slit or hammered into rods, and iron drawn or hammered less than three-quarter inch square, and all wrought iron, except bars unwrought, hoops and scraps, and all manufactures of iron and steel prohibited.

1788. There were 77 furnaces in all, producing 61,900 tons of iron a year, being 804 tons to the furnace; being an increase in the yield of 173 per cent., owing to improved machinery and greater skill.

1795. The act of '86 prohibiting the export of tools and machinery, &c., was made perpetual.

1796. Duty raised to £3 1s 9d per ton, being an advance of 5s 7d. At this time there were 121 furnaces, producing 124,032 tons per annum, being 1,032 tons to the furnace—showing an increased yield of 26 per cent. in 8 years.

1797. The duty was raised to £3 4s 7d, being an increase of 2s 10d.

1798. The duty was raised to £3 15s 5d, being an increase of 10s 10d.

1800. Tooke, in his work on "high and low prices," Part IV., page 37, speaking of this period of the iron trade, says:—"Thenceforward the produce of iron in this country (Great Britain) proceeded so rapidly, that, with the aid of further duties, amounting almost to a prohibition of importation it not only kept pace with the increasing demand, but has eventually nearly superseded the use of foreign iron in this country, and has furnished a surplus for exportation. The price of foreign iron, accordingly, fell almost progressively from 1801 till the close of the war—(1815.)"

1801. The black band ore discovered in Scotland by Mushet. The same year he introduced a new system of coking the coal by which a saving of fuel was obtained.

1802. There were 168 furnaces, estimated to produce 170,000 tons.

1803. Duty raised to £4 4s 4d, being an increase of 8s 11d.

1804. Duty raised to £4 17s 1d, being an increase of 12s 8d.

1805. Duty raised to £5 1s, being an increase of 3s 11d.

1806. Duty raised to £5 7s 5d, being an increase of 6s 5d.

At this time there were 227 furnaces in all, of which 167 were in blast, producing 258,206 tons per annum, or 1,540 tons to the furnace—showing an increased yield of 49 per cent. in 10 years.

1809. Duty raised to £5 9s 10d, being an increase of 2s 4d.

1813. Duty raised to £6 9s 10d, being an increase of £1.

1814. Mr. Hill patents the use of puddler's and heater's cinder in the blast furnace instead of ore.

1818. Product this year estimated at 300,000 tons, showing an increase of 41,794 tons a year.

1819. Duty, if imported in English vessels, raised to £6 10s per ton.

Duty, if imported in foreign vessels, raised to £7 18s 6d per ton.

Iron slit or hammered into rods; iron drawn, or hammered less than $\frac{1}{4}$ of an inch square, (heretofore prohibited,) now admitted at a duty of £20 per ton.

Pig iron, heretofore charged a duty of 27 $\frac{1}{2}$ per cent., now charge a duty of 17 $\frac{1}{2}$ 6d per ton.

Kinds not enumerated, heretofore prohibited, now admitted at a duty of 50 per cent.

Hoops heretofore charged £11 8s 4d per ton, now charged £23 15s per ton.

1820. Mushet computes the product this year at 400,000 tons, being an increase of 141,974 tons on the make of 1806, or 55 per cent. in 14 years.

1823. Amount of iron produced, 452,066 tons, being an increase of 193,860 tons, or 75 per cent. in 17 years.

1824. Black band ore first used alone in the furnace, at Monkland, Scotland.

1825. There were 261 furnaces in blast.

103 " out "

364 " producing 581,367 tons, being an increase of 129,301 tons, or 29 per cent. in two years; average yield per furnace, 2,228 tons; an increased yield per furnace of 45 per cent. in 19 years.

M. de Villefosse states the price of bar iron at the works, in various countries, this year, to be—

France.....	Per ton £26 10
Belgium and Germany.....	" 16 14
Sweden and Stockholm.....	" 13 13
Russia and St. Petersburg....	" 13 13
England, at Cardiff.....	" 10 00

1826. Duty reduced to £1 10s on bars, being a decrease of £5.

Slit, or hammered into rods, reduced from £20 to £5.

Hoops, duty not changed, per ton, £23 10s.

Pig iron, per ton, £10.

Kinds not enumerated, 20 per cent.

We have now traced the English duties through fifteen different changes, during a space of 147 years of unwavering protection, always under specific duties, and always increasing in amount, until they were no longer needed. We subjoin a list of the countries they shipped iron to at this time, arranged in the order of the quantities they took respectively. It comprises every nation in the world, the United States standing second in quantity. In 1830 we became the largest customers, and have remained so ever since.

Tons.		Tons.
Asia.....	12,631	Mexico and S. A. Republics, 2,317
United States.....	12,491	Turkey and Egypt 2,273
Italy.....	9,435	Gibraltar..... 1,601
France.....	7,910	Spain..... 1,493
British West Indies 6,908		Africa..... 1,411
N. A. Colonies.....	6,067	Malta..... 660
Portugal.....	6,067	Denmark..... 319
Netherlands.....	4,759	Russia..... 159
Brazil.....	2,789	Norway..... 94
Germany.....	2,615	Prussia..... 68
Foreign W. Indies 2,515		Sweden..... 10

The imports of foreign iron for consumption for

the 10 years previous to 1826 averaged 9,729 tons, or 10 $\frac{1}{2}$ per cent. of the exports of British iron.

And for the succeeding 10 years of low duties, were 14,586 tons, being 10 $\frac{1}{2}$ per cent. of the exports of British iron for the same period, showing that the duty had become a dead letter before it was taken off, as the imports of foreign iron, after the duties were taken off, did not quite maintain their proportion to the exports of British iron. We subjoin a table of the imports and exports for 20 years after the reduction of the duties, averaged for each period of ten years.

	Average Annual Amount.		English Iron		Foreign Iron	
	Exported.	Imported & Consumed.	Exported.	Imported & Consumed.	Exported.	Imported & Consumed.
Average for 10 years ending Jan'y 5th, 1806	29,447	35,541	1816	50,908	14,373	9,729
Duty Reduced....	1826	92,721	1836	142,996	14,586	19,479
	1846	332,810				
Average Prices in England.						
English Bars. Swedes Bars. Russian Bars.						
Average for 10 years ending Jan'y 5, 1806	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
1816	18 10 8	31 9 6	19 8 0	1816	14 3 9	17 9 0
Duty Reduced.	1826	10 5 6	16 12 6	17 15 0	1836	7 8 9
	1836	7 8 9	14 10 0	18 10 0	1846	8 0 11
	1846	8 0 11	12 10 8	18 2 6		

But every maker of iron knows that English iron, and Swedes or Russian, (forming nine-tenths of their imports,) cannot be regarded as competing articles. The latter iron being all charcoal hammered bars, is entirely used for purposes for which the English iron is not fit, and is, in fact, a raw material to the English manufacturer of steel, and other fine articles, and, therefore, it was against their interest to have had a duty placed on it. Mushet "Iron and Steel," page 536, speaking of this difference says:—"A variety of processes have been followed out to form a good quality of bar iron with coke pigs and pit coal; in no case has a uniform quality been produced, able to cope for all uses with the superior marks of Russia and Sweden. We acknowledge with pain and humiliation our dependence upon other countries for our Steel Iron, and it is with regret we see every industrious exertion made to obviate this dependence, foiled by the nature of our fuel, or the defective qualities of our ores.

1829. Mr. Neilson, of Glasgow, patents the use of hot-blast, effecting a great saving in fuel.

1830. Total number of furnaces, 360; yield 678,417 tons.

1833. Hot-blast better understood, and raw coal substituted for coke in Scotland, effecting a further saving in fuel.

1834. The prohibition to export iron rollers and tools, or machines belonging to iron works and various other works, recited and confirmed; penalty, forfeiture of the goods.

1836. Iron made this year estimated at 1,000,000 tons.

1837. Mr. Crane smelts iron successfully with Anthracite coal and hot-blast.

1839. Mr. Mushet states the number of furnaces to be 377 mineral coal, and 1 charcoal, making 378; in all, producing 1,248,781 tons.

1840. Number of works this year, 490; out of blast, 88; in blast, 402; producing 1,396,400 tons.

This being the result of a careful personal enquiry by a gentleman extensively known in the trade, is believed to be nearly correct.

This would give the annual product of each furnace 3,473 tons. Hot-blast furnaces, 162; Cold-blast furnaces, 240.

Coal consumed to the ton of iron in Scotland, 3 tons.

Coal consumed to the ton of iron in England and Wales, 3 tons 12 cwt.

1842. The association of Iron Masters of York and Derbyshire, estimate the decreased make of iron this year, at 22 $\frac{1}{2}$ per cent. on make of 1840, which would give for the product this year, 1,087,700 tons.

1843. Mr. Buckley—member of Parliament for New-Castle—estimates the make this year at

1,215,350 tons, being a decrease on 1840 of 181,050 tons, or 13 per cent.

The greatest decrease is in South Staffordshire, where it amounted to 106,900 tons, or 24 $\frac{1}{2}$ per cent. on their make in 1840.

Duty reduced on bars to £1.

" hoops and rods, £1 10s.

" pig iron, 5s.

1844. Amount of iron made this year, estimated at 1,210,000 tons.

1845. Make this year estimated at 1,512,500 tons.

1846. Duty on iron taken off entirely.

1848. The Commissioner appointed by Parliament reports the make of iron this year to be 1,998,568 tons, as follows:

	FURNACES.			PRODUCT.		
	In blast.	Out of blast.	Total.	Average per week.	Total for the year.	
North Staffordshire,	16	3	19	78	15	65,520
South do	77	62	139	80	70	320,320
Yorkshire.....	23	5	28	55	13	66,560
Derbyshire.....	20	10	30	91	10	95,160
Shropshire.....	28	6	34	60	14	88,400
Northumberland..	24	12	36	80		99,840
Scotland.....	89	41	130	115		539,962
North Wales.....	5	6	11	63		16,120
South do.....	151	45	196	90		706,680

Total No. in blast. 433 —

" out blast.....190 —

" in kingdom..... 623 —

" tons produced..... 1,998,568

1849. The make this year may be set down at fully 2,000,000 tons. The cholera and the disturbed state of the continent have tended to depress prices, both to the manufacturer and the workmen; and the closing of many of the continental markets for iron has forced the enormous quantity of 318,575 tons on our market, at prices below our cost of production.

Life of Richard Trevithick, C. E.

BY HYDE CLARKE, ESQ.

Continued from page 485.

Among Trevithick's modifications, was the adoption of a single cylinder for working the steam expansively. In 1816, Messrs. Jeffree and Gribble, who had been educated under Trevithick, erected a new engine with a 76-inch cylinder, at Dolcoath, where Trevithick had been engineer.* This was a single-acting Boulton and Watt engine, but was worked with high pressure steam expansively, supplied from boilers on Trevithick's construction.—In the first year it performed 40 millions, being a much higher duty than had hitherto been reached by any single cylinder engine. It long maintained its high character, and, singularly enough, improved as it was more used. In 1817, it reached 44 millions, and in 1819 was the best engine reported.†

One of Trevithick's plans was an improvement on steamboats by propulsion at the stern, and he suggested the use of a spiral wheel, revolving at the stern, as preferable to the use of side paddle wheels. The modern extension of this mode of propulsion is well known. Another proposition of his for promoting steam navigation, was the revival of the plan of giving motion to the engines by means of the reaction of the steam made to spout against the atmosphere.

In 1815, he effected an improvement in his high pressure engines, by forming the piston so that a ring of water should run all around it, and render the whole air tight; as he found in practice that a very moderate degree of tightness in the packing produced this result.‡

We now come to a romantic period of Trevithick's life. Uville, a Spaniard, seeing the decline of the American mines, from the insufficient power of drainage in the old works, was desirous of adopting the English method of pumping by steam. For this purpose he came to London in 1814, but his efforts were baffled by the difficulty of transporting cumbersome machinery over the mountain districts, and by the diminution of power to which atmospheric engines would be subjected when worked in

* Professor Pole, in Appendix G. p. 52.

† Lean's Historical Statement.

‡ Historical and Descriptive Anecdotes of the Steam Engine, by R. Stuart, p. 530.

the rarefied atmosphere of the Cordilleras. To Watt and to other eminent engineers he applied urgently, but without success.

When on the point of departing from England, frustrated in his object, he chanced to see a finished working model of Trevithick's engine exposed for sale in the shop of Mr. Roland, in a street near Fitzroy-square. This model Uville carried to Peru, and, to his unutterable joy, he had the pleasure of witnessing its successful working on the high ridges of the Sierra de Pasco.

Thus encouraged in his daring plan, he entered into partnership with two rich merchants at Lima, and obtained from the Viceroy of Peru the privilege of working some of the abandoned mines.—He once more started for England, and while on his voyage, talking with Mr. Teague, a fellow-passenger, of his anxiety to discover the inventor of the model, he was most agreeably surprised to hear Mr. Teague answer, that "Trevithick was his near relative, and that he could bring them together within a few hours of their arrival at Falmouth."

Accordingly, on his arrival, Uville proceeded to Camborne, and had an interview with the great Cornish genius, to whom no undertaking could have been offered which he would have better liked. They readily came to terms; Uville remained some months with Trevithick, profiting by his instructions, and after a tour through the mining districts, proceeded to Soho, but met with no encouragement from Boulton and Watt. Trevithick then undertook to furnish the necessary engines, and set actively to work.

In September, 1814, Uville embarked at Portsmouth, for Lima, taking with him three engineers and nine of Trevithick's engines. The names of the engineers were, William Bull, formerly Trevithick's partner; Henry Vivian, of Camborne, a kinsman of Andrew Vivian and Trevithick; and Thomas Trevarthen, of Crowan.

Uville was received at Lima with the greatest honors and rejoicings, and landed with his cargo under a royal salute. It was not until the middle of 1816 that he was able to surmount the local difficulties of transport, and place the first engine in operation. Trevithick, however, had nobly armed himself against the antagonist obstacles, and all that his ingenuity could suggest had been put in practice. The machinery, simplified to its greatest extent, was so divided as to form adequate loads for the weakly llama, and the beams and boilers, made in several pieces, were transported over precipices where a stone may be thrown for a league.

The engine erected at Lauricocha, in the province of Tarma, was put into operation, and, in the presence of the government commissioners, drained the first shaft of the mine of Santa Rosa, one of the Pasco district. The greatest expectations were created, and amid the profusion of honors showered upon the projectors, nothing seemed to be wanted but the presence of the meritorious inventor himself.

In the meantime, Trevithick had been actively employed in preparing for his departure. He had constructed several new engines, and an apparatus for the Peruvian mint. He had also directed his attention to a point of the greatest importance in the then scarcity of quicksilver, the purification of silver ore by fusion, for which he constructed furnaces.

In October, 1817, Trevithick gave up all his property in England, and, leaving it to his wife and children, embarked for Peru.

At this time he had successively achieved the application of high pressure steam, and had greatly increased the duty of the Cornish engine. The locomotive engine of his invention was then in practical operation, and had acquired the power of drawing 30 tons, at the rate of four miles an hour, and was found to be capable of surmounting rising gradients. Trevithick was in the zenith of his power, and all that he had promised, and which had been so long delayed by prejudice, was then accomplished; having, indeed, done more than any other man for extending the domain of steam.

In February, 1818, he arrived at Lima, where his presence excited the utmost enthusiasm. He was received with the greatest honors, while the official announcement of his arrival, in the Government Gazette, created the greatest expectations

among the whole people. He immediately obtained an audience of the Viceroy, and the Lord Warden of the Mines was directed to escort him, with a guard of honor, to the seat of his future labors. The chief men of the mining district came many days' journey to Lima to see and welcome him, and all exerted themselves to show their esteem for the well-deserving Don Ricardo Trevithick. Never, perhaps, was European so well received in the New Indies. He was no Las Casas coming to rescue an injured population from oppression, he came as a benefactor in another way, as a man of science, to repair their old resources, and to open new mines of wealth. It was the first benefit they had received from the Old World, and no wonder that a warm-hearted people welcomed Trevithick with as much enthusiasm as Columbus had awoke in Spain.

The exertions of Trevithick were crowned with success, and he was equally rewarded by their profitable return, and by the gratitude of the people. The produce of the mines grew in an unexpected degree, and the coining machinery was increased sixfold. His partners united in expressing their obligations to him, and the authorities showered down honors upon him. He is said to have been created a marquis and a grandee of Spain, and the Lord Warden of the Mines proposed to raise a statue to him in massy silver.*

The times, however, changed, political dissensions arose, and civil war broke out, Trevithick's fortunes changed to losses, and he determined to leave Peru; but this was no easy matter, for the veneration with which he was looked upon, as a benefactor sent from Heaven, made the people regard his absence as a public calamity, and take every measure to prevent his departure. At length he made his escape, through dangers which few less adventurous than himself could have encountered; and after escaping the terrors of the mountain and the desert, and the arm of the wandering savage, he again arrived safely in England, landing at Plymouth on the 9th October, 1827, bringing back, according to some accounts, a pair of silver spurs, as the sole remains of his once great wealth.

The great panic had then cast its gloom around, and Trevithick vainly endeavored to raise capital to carry out some of his colossal projects. Those who knew his skill feared the waywardness of his character; and those who did not know his ability were repulsed by the giant nature of his enterprises. It was in vain he urged his own success, and represented the boundless resources of the Andean range. While in America, he had obtained grants of large tracts of land, and on one estate had a mountain of copper ore, which, like the hill mines of Potosi, or Montserrat, it would take hundreds of years to hew down. Here he proposed to construct railways, and, by the aid of capital and machinery, make the shores of the Pacific a grand commercial mart.

From this time little was heard of him, and a few years afterwards he died at Dartford, in Kent, on the 24th of April, 1833, leaving no other inheritance to his family but the grandeur of his name and the glory of his works.

Trevithick married a Miss Harvey, a lady of good connections; her brother subsequently acquiring a large fortune. An anecdote is related in connection with this lady, which proves Trevithick's love for her, and his spirit of perseverance even in trifles, for that during his long courtship, and notwithstanding the business in which he was engaged, he never missed walking every evening several miles to visit her.

He left by this lady two sons, Frederick and Richard, both members of the engineering profession, and holding high appointments as superintendents of locomotives. Thus they live by the fruits of their father's ingenuity.

Trevithick was of a robust and well proportioned form, and had an expressive countenance. In his manners he was plain and blunt, but not rude; he maintained his opinions with honesty and firmness, and was only in fault that too frequent success made him adhere them with pertinacity. He had,

* For the best account of the early part of Trevithick's American career, see a paper of Mr. Boase, in the first Volume of the Transactions of the Geological Society of Cornwall, p. 312.

however, many disadvantages and many defects. The fertility of his invention led him to take more pleasure in imagination than in perseveringly carrying out his ideas to a practical result. Thus, even before his own departure for Peru, he had abandoned the locomotive to its fate, and left it to the kindred genius of George Stephenson for its accomplishment. The same is to be said of many other of his inventions, that he left to others to finish them, while some of his most promising designs went no further than the suggestion. Hence many were inclined to look upon him as a mere schemer, and withdrew their countenance, particularly after they had suffered in his experimental enterprises.

In reviewing his career, and comparing it with that of his great rival, Watt, we are able to appreciate the fortune of the latter, in the steady friendship and co-partnership of Matthew Boulton, a resource which had Trevithick possessed, we do not know that he would have achieved greater results, but he would have enjoyed more reputation in his lifetime, and a better share of this world's goods, while his inventions would have been carried out by himself, and not by others.

Whatever may be the opinion as to his superiority over Watt, or his equality with him, this must be confessed, that next to Watt no other man has yet done so much for the steam engine as Richard Trevithick.

An Essay on Pen and Pocket Cutlery,
Embracing a Detailed Description of the Mechanical, Chemical, and Manual Operations Performed on Certain Raw Materials, to Convert them into the Means, Implements, and Materials, for Manufacturing Pen and Pocket Knives.

BY A. L. HOLLEY.

Continued from page 487.

CHAPTER IX.—VIEW OF A CUTLERY ESTABLISHMENT TEN YEARS HENCE. SILVER BACK AND OTHER KNIVES. SILVER. TIN. GOLD. COVERING.

Having followed the fine and the jack knife through the various operations to which they are subjected, and left them perfect and complete, let us for a moment suppose ourselves in a cutlery establishment in the year 1860, and see the perfection to which our present machinery, and that which is now building or contemplated, will be eventually brought. Let us follow a plain jack knife for instance through the mechanical and other operations which are sure to be performed, and witness the result which is sure to follow. Here, the cutler's trade is divided, as stated in chapter I., and the consequence is, that each man can perform his part more easily and cheaply than he can at present.—Let us suppose ourselves at one end of the building where we see an improved machine, similar to one described in the last chapter, receiving at one side strips of heated iron, and ejecting at the other strings of scales and bolsters, which have passed through its bosses at the rate of perhaps 300 per minute. A boy, for 25 cents per day, takes these strips, and passes them through another machine which consists of a chisel moving vertically, and a carriage, and which separates the scales as fast as they are made. Another hand then places them in the die of a fly press, which by machinery described in the last chapter, and already in successful operation, marks the bolsters, pricks the orifices in the scales, and fits them to the plate. The first mentioned machine, imperfect as it is at the present day, will keep in operation at least 12 or 15 of the fly presses; so we will suppose 15 of the latter at work. Perhaps 10 other boys drill the bolsters, while with good fly presses and apparatus two boys can make and mark 150 springs per minute, and another can place them between rollers instead of under a drop, the fixtures being correct, and 10 more can drill them as fast as they are made. Two

hands at the press, and no less than 230 forgers could supply the blades at the rate of 150 per minute. These are drilled by five boys and made smooth on the tangs side by dozens in a machine already in operation to some extent, and consisting of a carriage and a burr wheel, arranged something like those of lathes for turning irregular surfaces, as gun stocks and lasts. Perhaps 12 boys could attend to these machines, and 12 more with similar apparatus could dress the backs of the springs. A substance made from gutta percha, which is now coming into use for knife handles, the colors of which are rich and variegated, which will not easily split, but can be pressed into any required shape, is bought cheaper than cocoa wood, and in the exact form of the handles. This covering is with a simple machine, consisting of a carriage, gauges and a double drill bored for the rivets by 10 or 12 boys—for boys and green hands can do this work as well as men—at the rate of 300 per minute, and we can almost imagine perhaps 10 machines, far more simple than those which make pins and hooks and eyes, rivetting this gutta percha to the scales at the rate of 18,000 pieces per hour. This is no idle speculation, however improbable the statement may appear at first sight. Two men can easily temper the springs with proper apparatus as fast as they are prepared, and 10 more with a lathe, similar to one before described, can dress them, and the scale edges, with charcoal and boulder. All is now ready to be put together, rivetted and hafted, and without running the risk of being called infatuated and insane, we will not suppose these operations to be performed by a machine, but by the old way, which would take perhaps 500 men. These are glazed by perhaps 250 hands, and finished by 100 more, and thus we see ninety thousand jack knives commenced and finished in one day by 1183 men, for the sum of \$1,567 75. If we may be permitted to suppose some of the last of these operations and the grinding to be performed by machinery, which in all probability will be the case, we have 90,000 knives made in 10 or 12 hours by perhaps 600 men and boys, for a sum not exceeding \$1,100. This would allow 150 knives, and about \$1 83½ cents to each man, thus making a dozen knives that now cost from two to three dollars, for from 16 to 20 cents, including materials—or three knives for four cents!

There is among the almost endless variety of knives, a pattern called the steel handled knife, which consists of a blade, rivet, and handle, the latter embracing the scales, covering and spring.—The handle is formed from two strips of steel; one end of each strip is a square rod, the other a flattened sheet. The square portions, which correspond, being welded, form the spring, and the other part, being bent in towards the inside of the knife, form the scales. The blade is fitted, dressed and rivetted in as usual, and the handle is glazed and polished with charcoal. The time is certainly not far distant when these knives will be made by machinery at an astonishing rate, and as there are no scales of wood to put on, and but two holes in the handle, we may suppose one machine capable of supplying some 75 forgers with perhaps 18,000 finished handles per day. Another very stout and useful, though uncommon knife, consisting of steel, iron or brass scales, [which form the covering and bolsters] a blade and spring could be made by a few workmen, aided by machinery in great quantities, and with little expense. Either a fly press and a drop, or a machine similar to the one in use for iron scale making, could form and bevel the

edges of these scales. The last named machine could make from 150,000 to 180,000 of the scales, which might be drilled and finished with the spring by a dozen men, by the ten thousand, while the blades, which are as it were the soul of the knife, would keep hundreds of workmen in employment. The backs of many fine knives are covered with silver, or gold, for the purpose of making them more rich and beautiful in appearance, and also to prevent them from tarnishing and rusting. For such purposes the precious metal, if it is to be milled, is rolled into very thin sheets, and if it is to be finished plain, it is left about the thickness of a shield. The springs are fitted as usual, then a portion of the backs, as thick as the silver, is removed with a file. The spring edges are then bevelled, and the whole left rough and tempered. The silver is cut into sheets about twice the width of the spring, and milled by holding them between a leaden cylinder and a steel plate, whose upper surface is indented, and worked with figures, etc. The silver is then placed on the spring, and the whole wound with extremely fine steel wire. A solder of tin and lead is placed with resin on the projecting edges of the silver, which is covered with a coat of chalk to prevent its burning, and the spring held over the flame of an alcohol, or an oil lamp, till the solder has fastened the silver to the rough and bevelled edges of the steel. The tangs, and the sides, ends and insides of the springs are then fitted, filed down and dressed, and the knife is finished as before described. The silver is polished with chalk and a brush revolving like a glazer, by machinery. Plain silver backs are put on in either the same, or another way, which consists of soldering them to a thin piece of steel shaped like the back of the knife, inside of which are the springs. Steel back knives are sometimes made in this way, but are no better than common knives, as the steel will rust and tarnish as well in one form as in another. The insides of springs are often fluted and worked by files and other instruments, and bolsters are sometimes figured, though they are usually considered more handsome when left plain and highly polished.

To be continued.

Daguerotyping Stars.

It was recently announced that Mr. Bond, of the Cambridge Observatory, had succeeded in taking a daguerreotype of the star Lyre, which is not visible to the naked eye. An interesting communication in relation to this subject, is published in the Boston Advertiser, from which we make the following extract:

"The question will doubtless occur to many of the readers of that article, to what good purpose can this discovery be applied? One of the first direct applications of it would be the measurement of the angles of opposition and distance of double stars. It is interesting to be assured of the fact, that the light emanating from the stars possess the requisite chemical properties to produce effects similar to certain of the solar rays, and that these properties retain their efficacy after traversing the vast distance which separates us from steller regions. Of this distance some idea may possibly be formed, if we can imagine a plain of two hundred millions of miles in extent, at the distance of the star alpha Lyre, and favorably presented to a spectator situated on the earth, appearing as a mere point, only measurable by the aid of an excellent telescope, furnished for an accurate micrometer; or that light moving at the rate of 190,000 miles in a second of time would require more than twenty years to traverse the intervening space. Yet such are the facts, and it follows that the ray of light which made the first impression on our daguerreotype plates on Tuesday evening, took its departure from the star more than twenty years ago, long be-

fore Daguerre had conceived his admirable invention.

"Our experiments have also a bearing upon the nature of the light emitted from the stars.

"The images which we have thus far obtained, are quite decided, having pretty distinct nuclei, although elongated, and too broad for the nicer purpose of measurement. This apparent enlargement of the disc we attribute, in a great measure, to two causes. One is the variable nature of atmospheric refraction, when influenced by sudden changes of temperature. This trouble we hope to get rid of by increasing the sensitiveness of the surface receiving the impressions. The other operation will then require less time, and of consequence, be subject to fewer and less extensive vibrations.

"The other difficulty to be overcome is the irregular motion of the machinery which carries the telescope. Although the machinery at present attached to the telescope is the best that German ingenuity could devise, and answers a tolerably good purpose on ordinary occasions, yet it is deficient for our nicer operations. The telescope should, during the nicer process, be propelled with a uniform sidereal motion, in order that the successive rays from the star may fall on precisely the same part of the plate which is to receive the impression. If this be not the case, the image will be deficient in distinctness of outline and unduly enlarged.

"To effect this, we intend to apply to our great equatorial, a machine which we have devised for the purpose of producing uniform rotary motion, one of which machines is now constructing at the observatory, to be used in connection with the electrographic operations of the Coast Surveys.

"It is our purpose to pursue the subject of daguerreotyping the stars, proceeding step by step from the brighter to those of lesser magnitude.—We do not despair of obtaining ultimately faithful pictures of clusters of stars, and even nebulae.

"Mr. Whipple, the Daguerreotypist, and his assistants, have cheerfully and perseveringly lent their aid on several occasions during the past and present years, furnishing us plates, apparatus, and valuable time, without charge."

Pennsylvania.

Central Railroad.—The following from the Pittsburgh Gazette shows the progress that is making on the Pennsylvania Central railroad:

We have had the pleasure of an interview with a gentleman who has just passed over the line of the Central railroad, and who has availed himself of rare opportunities of becoming acquainted with the state and prospects of that work, in which we are so deeply interested.

The line from Philadelphia to Huntingdon is in excellent order, and doing a good business, and meeting the expectations of its friends.

From Huntingdon to Hollidaysburg, the line will be finished sometime in the month of September, most probably by the fifteenth, and possibly by the first. They are laying down the rails at four different points, and are thus able to push the work with great rapidity.

There is, therefore, a certainty that by the first of October there will be continuous railroad communications from Philadelphia to Johnstown, using the Portage railroad across the mountains, which is in good order, and has had some new passenger cars placed on it lately. This will render but one transshipment necessary, at Johnstown, and will facilitate our communications with Philadelphia so greatly as to attract a large amount of the approaching fall travel and trade this way.

From Johnstown west to Bolivar, some 22 miles, the work will be finished early next season, and to the Monastery, in Westmoreland county, some time next summer. This brings the road into connection with the southern turnpike.

It is contemplated, also, to build a branch from the line to Blairsville, and it is highly probable that

it will be done next season. This will connect the line with the northern turnpike.

It is not probable that the line will be entirely finished to Pittsburgh, so as to be in continuous use, before the spring of 1852. This is owing to the very heavy work in Westmoreland county.—All the force that can work to advantage is now employed, and the work will be pushed with all the energy possible, but its completion cannot with certainty be calculated on before one year from next spring.

But by means of the canal to Johnstown, we may expect to do a good business, this coming fall, and by means of the canal and two turnpikes, a heavier business the fall succeeding.

We presume, however, that the line from this city to Turtle Creek will be finished this fall; or by next spring.

Eight miles of the mountain section, commencing at Johnstown, and going east, have been put under contract. All the work on the western end of the line is being performed in the most satisfactory and durable manner, the streams being crossed by stone arched bridges, and every pains taken to make the work a credit to the State. It will, doubtless, be one of the very best railroads ever built in the country.

New Hampshire.

Sullivan Railroad.—Directors for the ensuing year, William Warner, Burlington, Vt.; Charles Thompson, Charlestown, Mass.; Jabez B. Upham, Boston; Ralph Metcalf, Newport; Henry Hubbard, Jr., Charlestown, N. H.; Aurelius Dickinson, and Wm. Rossiter, Claremont. The board of directors chose Charles Thompson, of Charlestown, Mass., President; P. C. Freeman, of Claremont, Clerk, and George Denny, Esq., of Boston, Treasurer.

Maine.

Atlantic and St. Lawrence Railroad.

We copy from the Portland Argus the following condensed account of the operations of this road the past year, with the expenditures upon the same up to July 1, 1850.

The total amount paid and chargeable to construction of road from Portland to Paris Cape, is:

For station houses and depot lands in Portland, & improvements thereon.....	\$172,191 81
Land damages.....	36,793 48
Fencing.....	20,963 32
Grading and bridging..	591,733 69
Superstructure.....	456,484 18
Office expenses.....	17,208 38
Engineering department.	51,518 12
Corporators' expenses..	3,344 60
Sundry accounts.....	20,042 28

Extension of road across the city.....942 70

Interest on loans, being balance of interest account.....

Interest on city bonds..

" paid stockholders on stock.....

Equipment.

Locomotives.....

Passenger cars.....

Merchandise cars.....

Snow ploughs.....

The expenditures on road above

Paris, are.....

Total expenditure.....

The means of the company, to meet the above expenditure, have been derived from the following sources:

From assess. paid on shares.....	937,516 05
Rents and wharfage....	2,629 04
City of Portland loan..	653,500 00
Notes payable.....	121,480 87
Company's bonds to contract.....	20,000 00
Suspense account, (embracing assessments not credited).....	38,866 45
Net Inc. of road to July 1st.....	108,970 69
Showing a balance of assets received, of \$132,470 98.	

The income account of the past year, presents the following results:

Total receipts from passengers.....	79,148 08
" " " merchandise.....	56,890 59
" " " mail.....	3,257 00
" " " Rents and wharfage. 1,041 16	
" " " for use of cars, etc. on connecting roads.....	2,694 10

The current expenses have been—

For maintenance of way.....	\$12,807 09
For locomotive power....	12,002 56
For train expenses.....	14,074 56
For office establishment.	5,613 76
For station expenses....	6,217 09
For mail.....	235 77
For general expenses....	329 34
For fuel.....	8,313 52

Net receipts for year.....

Surplus on hand, July 1, 1849.....

Net income to July 1, 1850.....

The amount of city script is.....

On hand.....

The whole number of shares subscribed is \$10,189—equal to.....

Paid in on the above.....

Leaving a balance due of.....

This balance is said to be nearly all available.

Among the expenditures, large outlays have been made in the city of Portland for wharf property and lands adjacent to the depot, for the ultimate use and purposes of the road, but which are not needed to accommodate its business at the present time. Improvements have been made upon this property with a view to make it immediately productive, and the actual cost of that part of it with its improvements, not used for depot purposes, is \$60,191 63. Most of it is rented for four years, and the directors reckon its net annual income at \$5,000.

The total number of miles run on the road is 109,705. The number of passengers that have passed over the road the past year is 155,256, and the amount of merchandise is 43,058 tons. The average receipts per mile run is \$1.41 1-2, and the average expense is 58 1-2 cts., leaving a very large balance to go to the profit account.

The report enters into a full history of the contract between the directors and Messrs. Wood, Black & Co., for the completion of the road from South Paris to the junction at the boundary line. As we have already stated the particulars quite minutely, we deem it necessary only to present the following facts.

The price to be paid is \$26,200 per mile, one-half payable in cash, one-quarter part in the bonds of the company on twenty years with semi-annual interest, and one-fourth part in the stock of the company at its par value.

The road is to be finished, 23 miles, to Bethel Hill, by the first day of Dec. next, and to Gorham, in New Hampshire, about 21½ miles from Bethel

on the first day of July next, and to Connecticut river, during the year 1851, and the residue of the distance to the junction at the boundary line in three years from January 8th last; making over 104 miles from South Paris.

The company make the surveys and locate the road; and the depot grounds, outside of the six rods of located lines, and buildings, engine houses, and water stations, and most of the turntables, together with the equipment, are to be furnished by them. \$3,000 a mile, or about \$300,000 will be required for these expenditures, in addition to the cash payments of Messrs. Wood, Black & Co.

About \$1,650,000 will be needed for the cash payments towards the final completion and equipment of the road. Where is this to come from?

This question the directors answer. They have an unappropriated balance of city script of \$425,000. They expect an additional loan of \$500,000 from the city, which, they state, is all that will be ever asked for. Saying nothing of the cash on hand, and assessments still due, these means will carry the company through this year and next safely, and will leave about \$700,000 ultimately to be raised. The directors are of opinion that the increasing confidence, that is generally manifested in the productiveless of the road when it shall be opened, (it being by far the shortest and cheapest route between the ocean and the St. Lawrence river, at Montreal,) gives the strongest encouragement that the means can be procured to complete that portion for which no provision is made, without crippling the enterprise by ruinous sacrifices in the way of extra interest or by forced sales of the shares of the capital stock of the company at a depreciated value.

The directors have applied for an increase of the capital stock one million of dollars, making the capital stock of the company forty thousand shares—equal to four million dollars, and the Legislature have granted this increase.

The road is mostly graded and ready for the rails to Bethel, and the track is being laid.

A contract has been made by the contractors for 5,000 tons of rails, sufficient to lay the track to Gorham, of which about 1,200 tons have arrived. The contractors are making such progress in the execution of their work, that there is very little doubt of their ability to complete the road within the time specified in their contract.

Every exertion will be made, if the means are provided by the additional loan of the bonds of the city of Portland, to the amount asked for, to have the road opened to the valley of the Connecticut river during the ensuing year.

On the Canadian side seventy miles of the road will be in operation by November.

The directors state that the building of Commercial Street will cost about \$100,000, of which \$50,000 is to be paid by the Portland, Saco and Portsmouth road in their stock, and the other moiety by the At. and St. L. road.

The following persons were chosen directors for the ensuing year:

Josiah S. Little,
John B. Brown,
St. John Smith,
Eliphalet Greely,
Wm. W. Thomas,
John Anderson,
Ezra F. Beal,
James L. Farmer,
Wm. P. Fessenden,
Thomas Hammond,
Solo. H. Chandler,
Samuel Jordan.

A DETAILED STATEMENT OF THE CHARCOAL FORGES IN EASTERN PENNSYLVANIA IN 1850.

County.	Sold by Sheriff or failed, and date.	Kind of power used and No.	Date of construction.	Name of works.	Situation, P.O.	Owners.	Lessees.	No. of persons employed.	No. of persons employed, etc.	Market.	Kiln out fires.
Bedford,	1847 S	Water	1800	Hopewell,	Hopewell,	McDowell, Benedict and others,		4	3	H & E	1
"	1848 S	"	1808	Lemnos,	"	Thomas King & Co.		4	2	H & W	1
Berks,		"	1813	Bedford,	"	Swope King & Co.		5	5	H	1
"		"	1786	Rockland,	New Jerusalem,	Abm DeTurek,		1	1		
"		"	1803	Dale,	Dale,	David Schall,		3	2		
"		"	1799	Mount Pleasant,	Dale,	A. B. Bechtel,		2	1		
"	1842 S	"	1837	Franklin,	Reading,	J. & H. Thompson,		2	1		
"	1848 S	"	1770	Green Tree,	"	John W. Buckhart,		2	1		
"		"	1836	Exeter,	"	Moyer & Yocum,	G. Moyer,	2	1		
"		"	1830	Bloom,	"	Horatio Trexler,		2	1		
"		"	1797	District,	Pike Township,	E. & G. Brooke,		2	1		
"		"	1780	Birdsboro,	Birdsboro,	Jacob S. Spang,		3	1		
"		"	1780	Oley Forge,	Oley Township,	Jonathan Seidel,		2	1		
"		"	1825	Dowell,	Robeson,	H. P. Robson & Co.		2	1		
"	1842 F	"	1749	Charming	Furnace,	Joseph Seyfert,		2	1		
"		"	1830	Northkill,	Schattlesville,	"		2	1		
"		"	1840	Mount Airy,	"	Nicholas Yocum,		2	1		
"		"	1809	Speedwell,	"	Daniel Yocum,		2	1		
"		"	1835	"	"	Wm. Herbst,		2	1		
"	1842 S	"	1790	Rockland,	Rockland Township,	Bertolet heirs,	Jacob Snell,	2	1		
"		"	1795	Spring,	Earl	Jacob Deysher,		2	1		
"		"	1800	District,	Pike	George Reagan,		2	1		
"		"	1814	Union,	Albany	H. A. Seyfert, McIlvaine & Co.		2	1		
"		"	1846	Gibraltar,	Robeson	George Merkel,		2	1		
"		"	1828	Maiden Creek,	Hamburg,	G. McCamant,		2	1		
"		"	1833	Antes.	Birmingham,	John Kraizer,		2	1		
Blair,	1849 F	"	1833	Cold Spring,	"	D. H. Royer,		2	1		
"		"	1813-1844	Tyrone, 2 forges,	"	Spang, Keller & Co.		2	1		
"		"	1828	Franklin,	Williamburg,	Roy & Schumucker,		2	1		
"	1850 F	"	1805	Eina,	Yellow Springs,	Roy & McNeal & co.		2	1		
"		"	1810	Cove,	Williamsburg,	Dr. P. Schoenberger,		2	1		
"		Steam	1839	Portage,	Duncansville,	E. H. Lytle,		2	1		
"		Water	1816	Maria, 3 forges,	"	B. F. Schoenberger,		2	1		
"		"	1836	Alleghany,	"	John Bell,		2	1		
"	1850 S	"	1837	Gap,	E. Freedom,	J. J. Albright,		2	1		
Carbon,		"	1830	Mary Ann,	Antestown,	S. Balliet & co.		2	1		
"		"	1830	Ashland,	Lehigh Gap,	Valentines & Thomas,		2	1		
"		"	1828	Penasville,	East Penn,	Samuel Edmiston,		2	1		
"		"	1795	Bellefonte,	Bellefonte,	Irvin, McCoy & co.		2	1		
"	1850 F	"	1792	Rock,	"	C. & J. Curtin,		2	1		
"		"	1800	Milesburg,	Milesburg,	Irvin, Thomas & co.		2	1		
"		"	1811	Eagle,	"	M. B. & G. W. Buckley,		2	1		
"	1843 F	"	1840	Howard,	Howard,	Charles Brooke,		2	1		
Chester,		"	1792	Greenwood,	Penningtonville,	Ellis P. Irwin,		2	1		
"		"	1847	Hibernia,	Wagon town,	Wm. Dowlan,		2	1		
"	1848 S	"	1806	Pleasant Garden,	N. London X Roads,	George Christman, Sr.		2	1		
"		"	1750	Covenry,	Downingtown,	John B. Cristman,		2	1		
"		"	1790	Springtown,	Pottstown,	John Henderson,		2	1		
Columbia,	1847 S	"	1837	Washington,	Brandywine Manor,	G. & R. Shuman,		2	1		
Cumberland,	1837 S	"	1824	Catawissa,	Nittany,	Wm. M. Watts,		2	1		
"	1847 S	"	1830	Laurel,	Mainville,	Peter F. Ege,		2	1		
"		"	1811	Carlisle,	Carlisle,	H. G. Moser,		2	1		
"		"	1790	Liberty,	Liburn,	S. & W. Sawyer,		2	1		
Dauphin,		"	1830	Oakdale,	Elizabethville,	Longnecker & Snyder.		2	1		

A DETAILED STATEMENT OF THE CHARCOAL FORGES IN EASTERN PENNSYLVANIA,--(Continued.)

County.	Sold by Sheriff or failed, and date.	Kind of power used.	Date of construction.	Name of Works.	Situation, P. O.	Owners.	Lessees.	No. forge fires.	No. hammers.	Largest product.	Actual make, 1849.	No. of persons employed.	No. horses, etc.	Market.	Run out fires.
Franklin,	1849 S	Water	1846	Carrick,	Fannettsburg,	N. Kelley,	Witherow & Walker,	2	1	25	75	10	3	H & E	1
"	"	"	1790	Soundwell,	Roxbury,	Schaeffer & Fleming,	Lewis & Bros.	2	1	90	90	10	6	H & E	1
"	"	"	1834	Northeast,	Louden,	John Beaver,	Scheffler & Son,	2	1	40	32	13	4	H & E	1
"	"	"	1804	Valley,	"	"	"	2	1	50	50	15	6	H & E	1
"	"	"	1832	Warren,	Sylvan,	Bowers' heirs,	"	2	1	100	50	15	4	H & E	1
"	1842 F	S&W	1835	Montalto, 2 forges,	Montalto,	H. & H. Hughes,	"	2	1	300	200	150	30	H & E	1
"	"	Water	1836	Caledonia,	Grafenburg,	Thaddeus Stevens,	"	2	1	28	217	20	8	H & E	1
"	"	"	1837	Junata,	Alexandria,	S. Hatfield & Son,	"	2	1	600	600	20	8	H & E	1
"	"	"	1800	Barre,	"	Joseph Green & co.	"	2	1	700	700	40	18	E & W	1
"	"	"	1832	Savage,	Paradise,	John Savage,	"	2	1	500	75	50	20	E & W	1
"	1840 F	S&W	1842	Malinda,	Orbisonia,	Blair & Madden,	"	2	1	250	475	20	12	E	1
"	1848 S	Water	1804	Junata,	Shaver's Creek, P. O.	E. F. Shoenberger,	"	2	1	300	40	20	14	W	1
"	1850 S	"	1804	Rebecca,	McElavey Fort P. O.	A. G. Curtin,	"	2	1	900	27	10	10	E	1
"	1849 S	"	1805-1809	Coleraine, 2 forges,	Coleraine forge,	Lyon, Shorb & co.	"	2	1	1031	1631	45	30	W	1
"	"	"	1826	Elizabeth,	"	Martin Gates,	"	2	1	300	40	20	12	W	1
"	"	"	1831	"	Water street,	Issett & Harnish,	"	2	1	300	40	20	12	W	1
"	"	"	1930	Stockdale,	Spruce creek,	E. B. Isett,	"	2	1	305	305	20	12	W	1
"	"	"	1797	Brooke,	Gap,	George W. Buckley,	"	2	1	300	100	30	8	E	1
"	"	"	1725	Windsor,	Churchtown,	David Jenkins,	"	2	1	250	125	30	18	H	1
"	"	"	1750	Pool,	Goodville,	Benjamin Jacobs,	"	2	1	300	200	25	12	E	1
"	"	"	1793	Spring Grove,	Brickerville,	S. Jacobs' estate,	"	2	1	556	556	29	18	E	1
"	"	"	1750	Speedwell,	Lancaster,	R. W. Coleman,	"	2	1	556	300	30	12	H & E	1
"	"	Steam	1850	Lancaster,	"	George Ford,	"	2	1	640	564	25	12	H & E	1
"	"	Water	1828	Coemanville,	"	R. & G. D. Coleman,	"	2	1	644	497	40	20	H & E	1
"	"	"	1755	Martic,	"	"	"	2	1	230	309	25	12	H & E	1
"	"	"	1830	White Oak,	Oak Hill,	James Sproul's heirs,	John Alexander,	2	1	400	346	25	12	H & E	1
"	"	"	1838	Pine Grove,	"	Enos Pennock,	"	2	1	305	305	20	15	H & E	1
"	"	"	1810	Ringwood,	Christiana,	"	Charles Cloud,	2	1	305	20	12	16	H & E	1
"	"	"	1810	Sadsbury,	"	James Sproul's heirs,	George Steel,	2	1	150	200	30	16	H & E	1
"	"	"	1845	Union,	Jonestown,	"	"	2	1	225	150	35	12	H & E	1
Lebanon,	1795 New Market,	"	1795	Anville,	Anville,	J. B. Wideman,	"	2	1	300	100	25	12	H & E	1
"	"	"	1836	Monroe,	Fredericksburg,	Jacob Light,	"	2	1	140	100	15	4	E	1
"	"	"	1824	Nescopeck,	Berwick,	Jonathan Seidel,	"	2	1	521	521	32	12	H & E	1
"	"	"	1828	Heshbon,	Newberry,	George Westler,	"	2	1	205	205	45	12	H & E	1
"	"	"	1830	Hepburn,	Trout Run,	Wm. McKinney,	"	2	1	80	50	30	9	H & E	1
"	"	"	1831	Pine creek,	Jersey Shore,	A. D. Hepburn,	"	2	1	250	200	30	6	H & E	1
"	"	"	1810	Freedom,	Lewistown,	J. Vickers,	John Essington,	2	1	200	100	15	4	E	1
"	"	"	1838	Brookland,	Waynesburg,	John A. Wright & co.	"	2	1	521	521	32	12	H & E	1
"	1847 S	S&W	1750	Glasgow,	Pottstown,	H. N. Burroughs,	"	2	1	205	205	45	12	H & E	1
"	1849 S	Water	1733	Green Lane,	Summerytown,	Rittenhouse & Schall,	H. Potts & co.	2	1	100	80	30	9	H & E	1
"	1847 F	"	1844	Paxinas,	"	Wm. Schall,	"	2	1	250	200	30	6	H & E	1
"	"	"	1829	Fio,	Duncannon,	Leisnering & Wolverton,	"	2	1	250	200	30	6	H & E	1
"	"	"	1850	Flat Rock,	Manayunk,	Robert J. Walker,	"	2	1	250	200	30	6	H & E	1
"	"	"	1801	Schuykill,	Port Clinton,	M. Bubley & Sons,	"	2	1	250	200	30	6	H & E	1
"	"	"	1828	Suanna,	"	John Schall,	Schall & Taylor,	2	1	251	251	32	12	H & E	1
"	"	"	1816	Bruswick,	"	John Rausch,	"	2	1	251	251	32	12	H & E	1
"	"	"	1828	Hecla,	"	Koch, Hammer & Huntzinger,	George Focht,	2	1	60	30	20	8	H & E	1
"	"	"	1830	Mount Vernon,	"	Young & Jones,	"	2	1	150	102	30	10	H & E	1
"	"	"	1827	Berlin,	Barry,	Ludwig & Ege heirs,	"	2	1	100	100	20	8	H & E	1
"	"	"	1810	Castlefin,	Hartletown,	John B. Otto,	"	2	1	250	250	50	25	H & E	1
"	"	"	1770	Spring,	Castledin,	C. & C. Brooke,	"	2	1	300	350	50	25	H & E	1
"	"	"	1828	Woodstock	Spring Forge,	R. W. & W. Coleman,	"	2	1	250	250	50	25	H & E	1
"	"	"	"	"	Margaretta,	Hahn & Hines,	Curran, Himes & co.	2	1	223	190	40	25	H & E	1
"	"	"	"	"	"	"	"	2	1	200	200	45	24	H & E	1
35								389	168	32737	6880	24349	3946	3065	1377

* In the column head "Market"—E means Philadelphia; W means Pittsburgh; H means the interior, either at the works or to the country trade.

AMERICAN RAILROAD JOURNAL.

Saturday, August 10, 1850.

Great Work on Bridge Building, etc., etc.

JUST published in medium folio, One Dollar, 75 cts. to subscribers.

Part I. of a "THEORETICAL AND PRACTICAL TREATISE ON THE CONSTRUCTION OF BRIDGES IN STONE, IRON AND WOOD," By George Duggan, Architect and Civil Engineer.

The present part contains beautifully executed plans, elevations, sections, and centering, of the Bridge of St. Maixence, France, by M. Perronet, the eminent Architect and Engineer, and plans, elevations, sections, and details of the oblique Timber Bridge, 700 ft. long, constructed for a double track across the River Tyne, on the line of the Newcastle and Carlisle railroad, by John Blackmore, C. E., with an introductory article on the relative merits of the various materials employed in the construction of Bridges, as regards economy, strength and durability, and critical remarks on the various forms of bridges designed and constructed by the most eminent architects and engineers in Europe and America.

"PART VI. of Specimens of the Stone, Iron and Wood Bridges, etc., etc., of the United States Railroads," By George Duggan, Architect and Civil Engineer, contains specimens of the plates and letter press intended for the APPENDIX, being the commencement of a complete Treatise on the Theory and Practice of Bridge Building. This will be one of the most valuable works on the subject ever presented to the attention of engineers in this country—condensing the most important information on this branch of architecture contained in the writings of the most eminent scientific men in the French, German, Italian, and English languages, in the course of the last and present century. It will be illustrated by numerous accurate representations of bridges of the greatest celebrity in modern times. Elaborate articles will be given on the strength, property, and uses of the different materials employed, and on the most approved methods of constructing Coffin Dams, Foundations, Centering, etc., with descriptions and drawings of the various engines and Machines that were found most useful in constructing the works, and a selection of such specifications as may be of service to the practical bridge builder. The sixth number treats of the Application of Iron to Railroad Structures, and is illustrated by beautiful drawings of the Bridge across the Delaware at Saw Mill Rift on the Erie Railroad, and of the bridge over Fairfield street, on the Manchester and Birmingham Railroad. The great success of this work thus far is the best tribute to its scientific merit and its adaptation to the wants of the American engineer."—(New York Daily Tribune, June 28, 1850.)

Published by George Duggan, 300 Broadway, New York, to whom all communications should be addressed and subscriptions forwarded.

Parties remitting Mr. Duggan \$5 and the remainder \$4 when they have been supplied with the first six parts of the "Theoretical and Practical Treatise on Bridge Building, etc.," shall receive it monthly as published. To those making Mr. Duggan a present remittance of \$9, the work will be forwarded post free to any part of the United States.

Fagotted Car and Engine Axles

FORGED by RANSTEAD, DEARBORN & Co., Boston, Mass.

These Axles enjoy the highest reputation for excellence, and are all warranted.

Railroad and Mathematical Instruments.

KUNS & BASELER, Mathematical Instrument makers, manufacture and keep for sale all kinds of mathematical instruments: also drawing instruments, scales and balances for the use of chemists, professional gentlemen, jewellers, etc., etc., of the most perfect description, at the lowest price, at 81 Nassau street, New York.

Manassas Gap Railroad.—The President and Directors of this company have selected John McD. Goldsborough, Esq., as their Chief Engineer. Mr. G. was the Chief Engineer engaged in the construction of the York and Cumberland Railroad, and his success in that undertaking proved him to be a gentleman of high scientific and practical attainments.

European and American Railroad.

Under the above title, we give the final proceedings of the great convention recently held in Portland, for the purpose of establishing a new line for travel between this country and Europe, by extending a line of railroad to the eastern part of Nova Scotia, thence by steamer to Galway Bay, Ireland, and thence by railroads and steamboats to London and the Continent. This idea, though of very recent date, commands universal attention, and we think we may say universal approbation. This favorable reception is based upon the merits of the scheme, and not upon the efforts of interested parties who have ends to accomplish, irrespective of public convenience. By the proposed route, the sea voyage can be reduced one-third, and the gain is the difference in time by which a distance of one thousand miles can be run by a locomotive or steam ship. At the rate of 14 miles per hour a steamship will make this distance in three days, and a locomotive at the rate of forty miles, in one. If, therefore, the voyage to Europe can be shortened two days, a case, as lawyers say, is made out. The saving to be made warrants the outlay, and the opening of the new line is justified as a business and commercial undertaking upon this basis alone. By shortening the time, the expense would be diminished. This would therefore become the cheapest, as well as the line of convenience. The great increase of travel between this country and Europe will soon require the sailing of a steamer daily, the passengers of which would alone support the road. In addition to convenience and greater speed in travelling, the importance to the commercial world of abridging by two days the time it now requires to transmit intelligence from one commercial hemisphere to another, will vastly outweigh all considerations of the cost of the work. We have good reason to expect, therefore, that not only those travelling on business and pleasure, but also the commercial world will demand its construction as one of its most important instruments in the operations of business.

It is also a very important local work. The trade of the Provinces of New Brunswick and Nova Scotia naturally belongs to the United States. They are unequalled in resources by any State in the Union. The business relations which subsist between them and this country will alone give a very large business to a road. We think, therefore, that it can be very easily shown that the proposed line, as far as this country is concerned, would be a paying one, and that no objections exist against its construction on this ground. The great difficulty in its realization will be to obtain the means to build it.

If the scheme carries with it universal conviction of its importance, this very conviction will secure the means. The commercial world must build it as a matter of economy. Business men cannot afford to be without it. It is necessary, just in the way that steamboats are necessary. We therefore have a right to calculate upon aid to it, from its very importance, just as we see that a similar reason is opening several routes across the Isthmus of Panama. This sentiment as yet is inchoate and unorganized. It must soon take shape and proportion, and express itself in action.

In the Provinces another view of the importance of the work will secure its construction there. The Provinces feel that a crisis has arrived in their history, that an effort must be made to check the downward tendency of all their interests, and, that unless some remedy is applied, they never can recover

from the disastrous state of things that now exists. They have looked for their salvation to the Halifax and Quebec railroad—a road, which, if built, would only have increased their embarrassments. This project is now happily given up. All that the provinces need to restore to them their former prosperity is free trade and means of easy intercourse with the United States. This road will in the outset accomplish a part and probably the whole of this great desideratum. This is the view now taken of this project by the Provincials. They are fully alive to its importance, and they are prepared to make any sacrifice for the success of this great work. Provincial guarantee will make up what is lacking of individual subscription, and we entertain no doubt that as far as the Provinces are concerned, the means will be forthcoming, as fast as they can be judiciously expended. For that portion of the line in Maine we cannot see our way so clear. In the Provinces the subject of railroad construction has long engrossed the attention of the inhabitants. They have accomplished nothing, through the fault of their scheme. A suitable one is now provided, and they have only to transfer to it the interest excited in favor of another, and go to work. From Bangor to the State-line the means for the work must come mainly from abroad. How readily they will be furnished we have not had sufficient time to see. Public opinion has not yet organized and matured itself. But as we said before, we believe the scheme well and substantially founded. If such be the fact, means can be obtained from the proper sources as soon as wanted.

As a railroad convention it was altogether the most imposing one ever held in this country. As a grand demonstration, it is well calculated to arrest attention. The speeches of those present and the letters of gentlemen invited to attend, showing a thorough and full appreciation of the importance of the work, furnish the best evidence in the world of the soundness and practicability of the scheme. It is one of those great projects commanding an universal assent, which is sure in the end to write itself in legible times.

The Remington Bridge.

[The following article was crowded out of our last paper by other matter.]

We were free to express our opinion of Mr. R.'s bridge, because opinion could do him no injury. Its success is to be a matter of experimental demonstration. Any opinion of our own cannot change the quality of the materials used. With a strong wish that his bridge may prove to be all he claims for it, we still are unable to change our opinion, or to find any reasons in his articles for doing so.

Our authority for saying that Mr. R. made use of the Truss in his practical bridge, is the gentleman exhibiting his model in New York. We suggested as an objection the great oscillatory and undulatory motion of the bridge; and he informed us that this was obviated in the bridges for use by means of the truss, as stated; this appeared to us to be a great improvement, and to obviate one great objection to the bridge. It was this very oscillatory motion that caused the bridge to break a few days since, as a party of gentlemen were passing over it. It threw the load upon one of the outside chords, which failed, and precipitated the whole party to the floor. This accident was caused by this oscillatory motion, which Mr. R. says his bridge is entirely free from. We certainly cannot tell what he means by this statement, as exactly the opposite is the fact, as any one can readily see.

His bridge being constructed with the least amount of material, will be the most undulatory bridge used.

If Mr. R. dispenses with the truss, then his is simply a wooden suspension bridge—the strength of it depends entirely upon the strength of the wood used. Now, Mr. R. has made no new discoveries in the strength of woods; that of the various kinds was determined by actual experiment long before he was born: If he claim any new discoveries here, or if he claims to subject wood to any different strain from what it is subjected in all bridges of long spans, he claims something to which he has no right. The strength of a truss bridge depends mainly upon the strength of its bottom chord, and the more perfectly this maintains a right line, the stronger the bridge. To ascertain the strength of a Remington bridge, a person has only to turn to tables of the strength of materials, found in all books on engineering, and there ascertain the strength of the wood used; and by deducting the weight of the bridge, he has its capacity to sustain a load. Mr. R. has thrown no new light upon this subject; nor are we the wiser for anything he has done. Mr. R. claims that he has established this new principle in mechanics, that "the tensile strength of timber when in nearly a horizontal position, is made to sustain nearly the entire weight necessary to separate the fibres." This truth is as old as the hills. It is affirming a self-evident proposition. It reminds one of the schoolmen's definition of light. "Light," said they, "is being perspicuous as far forth as perspicuous." This new principle of his is applicable to suspension bridges, and is the very one upon which they are constructed. All the material used is made a sustaining power. Is Mr. R. familiar with the principle upon which all bridges are constructed?

Again, Mr. Remington claims that his own bridge is as much stronger than iron, as 14 is to 9! His model, with three stringers, sustained a weight of 14 tons. He says that a bar of the best charcoal iron, one inch square, will sustain only three tons, and refers to Telford for authority.—We have examined Telford's tables, and find that he gives 29 2-3 tons as the strength of a bar of iron one inch square! A bridge, therefore, upon the authority of Telford, with iron stringers or chords in the place of wood, would sustain 89 tons. The relative strength, therefore, of wood and iron suspension bridges, with stringers or chords of the same size, is as 89 to 14. These results agree very nearly with the experiments of other distinguished engineers. See Weisbach's *Mechanics*, page 367, and Whittington's *Engineering*, page 409. We are certainly astonished to see a man coming forward at this late day, and claiming that wood is stronger than iron; or that he has discovered some new quality in the strength of the former.

While upon this subject, we cannot help giving to new discoverers a word or two of advice, (which we think Mr. Remington has never followed.)—After they have made a great discovery, let them keep it entirely to themselves, and immediately go to work and see if some one has not anticipated them in the same thing. In nine cases out of ten will they find this to be the case. Some wiser, older, and more industrious head has got the start of them. Having said nothing about their discovery, they are saved the mortification of claiming as new what is already in existence, and the expense of patenting and bringing into notice what is worthless. Every day brings out something new

and valuable, but where there is one prize a million blanks are drawn. What immense sums are annually paid into the Patent office to secure worthless patents, and what an immense amount of labor and how many anxious hours are thrown away for the want of a proper knowledge as to what has been accomplished, and what is valuable in the mechanic arts.

It will do very well to claim as valuable an article when its quality never can be tested. The imagination may be strongly affected by reading the certificates of the wonderful cures effected by Dr. Townsend's sarsaparilla. The person buys and drinks, and is effected through the imagination, where probably is the seat of the disease. This is the grand secret of the success of all the great healing nostrums of the day. But when you come to deal with the natural laws of gravity and attraction, it is a very different affair. These are inexorable, and cannot be changed by the imagination or the will. They are not the subjects of opinion, but of experiment, and he who affirms anything of them not already established by experiment, goes beyond his province, and becomes a charlatan, and not a discoverer. Let Mr. Remington take the right ground, and claim as new only what he is entitled to; let him exhibit his models, which are certainly very pretty things to look at, and make in this way all the money he can, and we will give him a helping hand; but when he comes before the world as a great discoverer, he will find that this title will not be recognized, and he must not complain if people point out to him his proper position.

New Hampshire Railroad Law.

New England still indulges in her long cherished habit of over legislation, in spite of the ridicule it so often provokes from the rest of the Union.

By an act lately passed by the Legislature of N. Hampshire, in amendment of the laws in relation to railroad corporations, the 1st section prohibits the issue of free tickets save to persons travelling on business in connection with the road, and to persons poor or in misfortune. If the Legislature aims to govern the operations of their railroad companies thoroughly, why does it not specify the style of rails, locomotives, cars, depots, etc., that each company should adopt; the number of trains to be run, speed to be maintained, hours of starting, rates of fare and freight, salaries of officers, etc.? The clause qualifying persons poor or in misfortune to receive free tickets is in accordance with the true spirit of Christianity, were it not made void by the necessity imposed upon the applicant of proving to the satisfaction of the Legislature his qualification. The president and officers of the company may be well convinced that a poor man who wishes to go by the next train to meet his dying wife or daughter is qualified to go free; but the applicant must stay and prove his qualification, and in the meanwhile his wife or daughter dies.

Sections 2d and 3d are if possible more absurd than the 1st section. They seem to be founded on the absurd fact that the people of New Hampshire in general, and railroad companies in particular, do not know how to manage their own business; and the "modus operandi" of getting the fare from passengers and punishing officers who do not collect the fare is noted most minutely.

Section 7th values a man's life at \$500 to \$5,000 and no more. A wife may therefore get somewhere between the above sums by having her husband killed on a railroad; the market price of the victim

to be determined doubtless by reference to some ingenious human life tariff invented solely for the use of the company.

Vermont.

Passumpsic Railroad.—The annual meeting of the stockholders of the Passumpsic railroad was held at White River Junction on Wednesday last.—There was quite a full attendance. The annual report was read and accepted, and the following named gentlemen elected as board of directors for the following year:—E. Fairbanks, Josiah Stickney, Wm. Thomas, Addison Gilmore, Wm. T. Weld, B. B. Mussey, Fitzhenry Homer, Oliver Dean, Emmons Raymond, Asa Low, Joseph Sawyer, Elijah Cleveland, L. H. Delano, J. C. Lee, Arthur Latham.

Maine and Nova Scotia Railroad Convention.

The second and third days of the Convention were chiefly taken up in listening to the speeches of several gentlemen, discussing the subject in all its relations. It was addressed by Messrs. Perley, Fisher, Wright, McFarland, Wilmot, Birney, Fairbanks, Chandler, Baird, and Gray, of New Brunswick; Uniacke, Dickey, Johnson, Pryor, and Fraser, of Nova Scotia; Dearborn of Mass.; F. O. J. Smith, J. S. Little, I. Washburn, N. Smith, and G. T. Shepley, of Maine. The great object of the speeches, particularly those of the speakers from the Provinces, was to show the capacity of that portion of the line to support a Railroad. That the natural resources of the lower British provinces is unsurpassed, is well known; they have coal and iron in abundance, and fertile soil and unrivalled commercial advantages. Their delegates were gentlemen thoroughly conversant of all these resources; and a great mass of useful information was laid before the meeting.

The Hon. Mr. Wilmot then submitted the following resolutions, which were unanimously adopted:—

Resolved, That the spirit of the age and the progress of the modern improvement, demand the most rapid and certain means of intercommunication between the people of the old world and those of the new.

Resolved, That this object can be best effected by the construction of a line of railway, leading from the great seats of population and business in the United States and Canada, through Maine and the Province of New Brunswick to some convenient port on the Atlantic coast of Nova Scotia.

Resolved, As the firm and deliberate opinion of this convention, that the time has arrived when the construction of such a line of railway shall be commenced, and that it shall be designated THE EUROPEAN AND NORTH AMERICAN RAILWAY.

Resolved, That this great railway, connected as it will be with ocean steam navigation and the railway systems of the whole of Europe and America, which traverse empires, kingdoms, colonies and states for the advantage of all, deserves to be regarded, not by the commercial world alone, but by the Statesman, the Lawgiver, and the Philanthropist, as one of the greatest links in that mighty chain which is fast encircling the whole earth, strengthening the bands of brotherhood and Christian fellowship, multiplying the ties of lineage, and bidding fair to constitute of all mankind, but one great commonwealth of nations.

Resolved, That a network of railways now over-spreads a great portion of the United States and Canada, and extends from the far west to the valley of the Kennebec in one unbroken and continuous line, it is expedient that the European and North American railway should consist of an uninterrupted line of communication by land from the valley of the Kennebec eastwardly through New Brunswick to the eastern coast of Nova Scotia, from whence the ocean may be crossed by steamships to the western coast of Ireland, as the shortest ferry across the Atlantic.

Resolved, That as a means of communication for all time between the nations of Europe and the whole of North America, the railway should be built in a durable and substantial manner.

Resolved, That by shortening the time of transit across the Atlantic Ocean by at least one-third the entire business travel between Europe and America will be eventually drawn over this line of railway.

Resolved, That the through business which the proposed line of railway must command, independently of way and local traffic, will render it a most profitable undertaking and cause the commercial value of its stock to be equal to that of any railway in the world.

Resolved, That from the valley of the Kennebec in Maine to the eastern terminus on the Atlantic coast of Nova Scotia, the proposed line of railway will traverse a country abounding in natural resources and possessing all the elements of wealth and commercial greatness in an unusual degree; that although now sparsely populated, this line of country under railway influence will soon become densely peopled, and every species of industry will be called into existence among its inhabitants.

Resolved, That this railway demands for its completion, the united and vigorous action of citizens of the United States—of all British subjects—and of all who desire to promote agriculture, commerce, manufactures, and the progress of the arts and sciences in connection with the firm establishment of peace and good will upon earth.

Resolved, That the State of Maine, and the provinces of New Brunswick and Nova Scotia shall be called upon to grant concurrent charters for the incorporations of companies to construct the proposed railway from the valley of the Penobscot to the eastern terminus of Nova Scotia.

Resolved, That in addition to individual subscriptions for shares in the proposed companies, the aid of the public resources of Maine, New Brunswick and Nova Scotia, shall be solicited to the extent of one-half the cost of this line of railway; that grants of the public lands near the line shall also be asked; and that the Province of Canada shall also be solicited to contribute toward the construction of a work of such great importance to its public and private interests.

Resolved, That a special appeal shall be made to the stockholders of all railroads between New York and London, for aid to this railway, which to them will be of much pecuniary advantage, by promoting an endless stream of travel and traffic.

Resolved, That application shall be made to the governments of Great Britain and the United States respectively, for conditional contracts for transporting the European and North American Mails over this railway, for a long period, at remunerating rates.

Resolved, That the Legislature of Maine now in session, shall be called upon to grant a charter forthwith for the incorporation of a company to construct that portion of the line between the valley of the Penobscot and the eastern boundary of the State.

Resolved, That a Central Executive Committee of seven shall be chosen for carrying out the various measures indicated in the foregoing resolutions, and effecting such other objects as will best ensure the speedy commencement of the work.

Resolved, That, in order to facilitate the progress of the work, the members of the central committee be requested to correspond with the local committees to be appointed along the proposed line.

Resolved, That the proceedings of this convention shall be carefully and authentically drawn up and published in convenient form for general circulation in Europe and America.

To the fifth resolution, Hon. Mr. Johnson offered the following, by way of amendment:—

Whereas several routes have been suggested for the proposed railroad through the Province of Nova Scotia, and it is desirable that the most certain information within the means of the convention should be obtained before the particular line be selected in an adventure of such magnitude,

Resolved, Therefore that a committee be appointed of gentlemen of the United States uninterested in any of the local considerations that affect the inhabitants of New Brunswick and Nova Scotia

in the question indicated in the above whose office it shall be personally to inspect the different routes proposed for traversing Nova Scotia with the following objects concerning each specially in view.

The distance and time of transit by each—the physical advantages and disadvantages; the population, resources, and nature of the country, including the means of providing for the work; the probable and way passage and traffic and the amount of subscriptions from the inhabitants that might be justly relied on; and most particularly the general cost of raising the necessary funds within a reasonable period, and the time when the undertaking may be brought into effective operation by each route.

And that the committee report on these and other points of comparison which they may deem important as respects each line, to the Standing Committee, and such report finally to determine the route to be accepted as final, by Maine, N. Brunswick and Nova Scotia.

This amendment was rejected.

The proceedings of the Convention were characterized by the greatest enthusiasm, and the most cordial good will—the representatives of different communities and different interests, all uniting, with the most fraternal feelings, to promote an object, the influences of which they believed, are to reach far beyond themselves—and are to confer a boon

upon the race. It was this idea which gave a distinctive character to the Convention, and to this it owed the harmony and good feeling which prevailed. At the close of the proceedings, the Hon. Mr. Gray, of New Brunswick, then offered the following resolution, which was unanimously adopted:—

Resolved, That the thanks of this convention are justly due to John A. Poor, Esq., of Portland, for his unwearied zeal, untiring perseverance, and judicious exertions in the preliminary arrangements, the organization, and the happy and successful management of this convention.

And further Resolved, That the thanks of this convention shall be and are hereby publicly and heartily tendered to the said John A. Poor, Esq., for his most valuable services in this important and most interesting occasion.

The executive committee contemplated in the seventeenth resolution, was then appointed as follows:—

John A. Poor, of Portland, Anson G. Chandler, of Calais, Elijah L. Hamlin, of Bangor, George Bousford, of Fredrickton, N. B., Robert Jardine, of St. John, N. B., Hon. Mr. Uniacke, of Nova Scotia, R. B. Dickey, Esq., of Amherst, N. S.

After passing the customary complimentary resolutions, the Convention adjourned, *sine die*.



To Merchants, Railroad Companies, Machinists and Boiler Makers.

THE subscribers beg leave to call attention to their very large stock of Iron and Steel—of American, English, Swede and Norway make—of all the different kinds in use. Also, Railroad Iron, Ship, Boat and Railroad Spikes. They are also Agents for the Best Pennsylvania Locomotive Boiler and Tank Iron, each sheet of which will be stamped and warranted, at lowest mill prices. Our prices for all kinds of iron will be found very low, either for cash or approved credit.

BRINK & DURBIN, Philadelphia.

Great American Engineering

AND MECHANICAL WORK, just published in medium folio One Dollar, 75 cts. to Subscribers. Part VII of "Specimens of the Stone, Iron & Wood Bridges, Viaducts, Tunnels, Culverts, &c., &c., of the United States Railroads." By George Duggan, Architect and Civil Engineer.

The present part contains beautifully executed plans, elevations, sections and details of the elegant timber Bridge, (Burr's Patent,) 150 feet span, across Salmon River, Malone, on the line of the Northern-Ogdensburg-railroad, and isometrical views of Bridges 30, 40 60, 82 and 88 feet span on the line of the Utica and Syracuse railroad, with specifications, form of contract, &c., &c., for the Connecticut River railroad.

"It is a work that was a great desideratum, and must prove of great benefit to the engineering profession generally, and especially to the tyro in practical engineering and mechanical knowledge; in truth it strikes us, that it would require years of labor and patient toil on the part of a young engineer to prepare the drawings, and collect the information that will be embodied in this work, and can now be secured for the trifling sum of \$9."—[Scientific Amer. March 16, 1850.]

In connection with this subject (Iron Railroad Structures) we take occasion to call attention again to Mr. Duggan's valuable and expensive publication, exhibiting drawings, with full descriptions of the various stone, iron and wooden bridges, viaducts, tunnels, culverts, etc., of all the Railroads in the United States. Mr. Duggan is an accomplished Architect and Civil Engineer, who came from Ireland to it is country to exercise his profession; but finding Railroad construction here, in many respects, different from that he had been accustomed to in Europe, he applied himself to the study of our system; and the fruits of his researches and investigations embodied in this work, are well calculated to meet the exigencies of engineers, and to assist draughtsmen, bridge builders, mechanics and students.—[N. Y. Journal of Commerce, Feb. 14, 1850.]

Published by **GEORGE DUGGAN,**
300 Broadway, New York.

To whom all communications should be addressed, and subscriptions forwarded.

MINING AGENCY.**Capt. O. H. Matthews,**

Civil and Mining Engineer, F. G. S., London, etc. HAVING completed his three years engagement on Lake Superior, is open to negotiate for another appointment as Mining Agent, or Superintendent of Mines. Also, to give his opinion and advice upon Mineral Lands, to Buyers and Sellers of Stock, or to be consulted on any section in this important branch of national industry.

The most implicit confidence may be relied on, and immediate attention given to all communications (pre paid). Address Capt. O. H. Matthews, Toronto, July 27th, 1850. 3m

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Having an extensive Wharf in front of their works, it will afford a safe harbor for all classes of steam vessels that may require repairs during the winter.

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Savannah, Ga., May 22, 1850.

FOWLER M. RAY, Esq.,

Dear Sir: I have no hesitation in saying, after having used on our road your springs and Fuller's, that I consider yours decidedly the best in every particular, and in this opinion I am sustained by all our officers. Fuller's spring has a tendency to split, and also to chafe or abrade by the constant friction on the cast iron plates or disc: and in my opinion is not near so elastic as yours.

Your springs, which have been in use on our road for 12 or 15 months past, and in constant use under both passenger and freight cars, are to all appearances as elastic, sound and good, as when first put in use.

We are now building eighty-five new cars, of which for fifty-sets the springs have been ordered of you.

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Connecticut River Railroad Office, }
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Dear Sir: It is now about two years since I first tried the experiment of using a set of Ray's India-rubber Springs upon one of our merchandise cars, and although the car has been in constant service since that time, I do not on examination find the slightest difference either in the thickness or elasticity of the material.

The same result has followed wherever we have applied them, either for wheel or draw springs on Engines, Tenders or Cars. At present we use no other; either in replacing old springs or building new cars—and I am perfectly satisfied that for economy, durability, safety, and ease of motion, that Ray's India-rubber is the best article for Springs which has been presented to the public.

Yours respectfully, **J. HUNT,**
Supt. Connecticut River Railroad.

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D. N. PICKERING,
Supt. Motive Power, Bost. & Wor. Railroad.
Boston, April 15th, 1850.

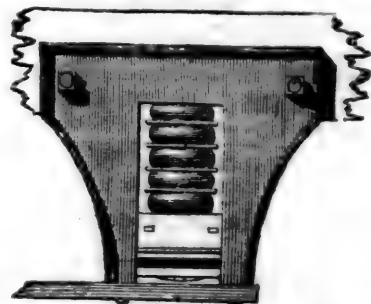
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THESE SPRINGS ARE THE CHEAPEST, the lightest and most durable of any yet known. They are easily applied to new or old cars, and there is small possibility of any accident occurring to them.

Other parties through Mr. Ray set up claims to an India Rubber Spring which, though the same in principle, is very inferior in its working and durability.—Actions are in progress for an Infringement on Fuller's Patent against parties using that Spring.

The superiority of Fuller's Spring over that claimed by Mr. Ray is fully established and has frequently been testified to. The following are from gentlemen who have had much experience with both Springs.

"It will afford me pleasure to recommend your springs to the companies in this region, in preference to Ray's which I am confident are inferior in mechanical arrangement to yours." **JOHN M'RAE,**
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"I do not hesitate to allow you to say that I concur in Mr. M' Rae's opinion that Ray's springs are inferior in mechanical arrangement to Fuller's. I repeatedly expressed that opinion long before Mr. M' Rae had seen your springs (as I believe) and entertain it still." **WM. PARKER,**
Gen'l Supt. of Baltimore and Ohio R. R.

Office of Supt. Norwich & Worcester R.R. Co. }
December 26, 1849. }

"I most fully concur in the opinion of Jno. M' Rae, Engineer of S. Carolina Railroad, that 'Ray's Springs' are inferior to Fuller's Springs; and shall with pleasure recommend them to all Railroad Companies for adoption. I have used both springs on this road and have no hesitation in saying that I should in all cases prefer Fuller's Spring."

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The following result has been obtained by experiment upon one railroad.

A set of Trucks fitted with Steel Springs cost \$190.77 and weigh 2355 lbs. The same with Fuller's Springs, 131.71 " 1911 lbs.

Difference, \$59.06 " 444 lbs.

Not only is there an advantage in the cost, but owing to the great reduction in weight, the car can be made lighter throughout, and so an enormous saving in weight may be effected in a Train.

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Grant, James H.,

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February 9, 1850.

6m*

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October 27, 1849,

3m

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Models of this Track, on the most improved plans,
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Railroad Iron.
3,000 TONS C. L. MAKE 63½ lbs. per yard,
now landing and to arrive.
Also contracts made for future delivery of above su-
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300 Tons Banks Best Iron, Round, Square and Flat.
200 " English Bar " " "
10 " 9-16 Square Iron for Railroad Spikes.
For sale in lots to suit purchasers by
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New York, March 26, 1850. 3m

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THE Undersigned, Agents for Manufacturers, are
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quality, and of any size or pattern, to any ports of dis-
charge in the United States.
COLLINS, VOSE & CO.
74 South St.
New York, June 1, 1850.

Railroad Iron.
1,500 Tons weighing 58 lbs. per lineal yard.
500 " " 57 " "
500 " " 56 " "
500 " " 60 & 61 lbs. "
Also 2½ flat rails. All the above being of approv-
ed patterns. For sale by
DAVIS, BROOKS, & CO.,
68 Broad street.
N.B.—Rails imported on commission, or at a fixed
price.

Iron.
Pig Iron, Anthracite and Charcoal; Boiler and Flue
Iron, Spring and Blistered Steel, Nail Rods, Best Re-
fined Bar Iron, Railroad Iron, Car Axles, Nails, Stove
Castings, Cast Iron Pipes of all sizes, Railway Chairs
of approved patterns for sale by
COLEMAN, KELTON & CAMPBELL,
109 N. Water St., Philadelphia.

IRONDALE PIG METAL, MANUFACTURED
and for sale by the Bloomsburg Railroad Iron Co.
LINDLEY FISHER, Treasurer.
75 N. Water St., Philadelphia.

Railroad Iron.
2000 Tons, weighing 58 pounds per lineal yard,
of the most approved pattern of T rails, in
store and to arrive, for sale by
COLLINS, VOSE & CO.
74 South St.
New York, June 1, 1850.

Railroad Iron.
1675 Tons, weighing about 61 lbs. per yard, 90
tons, weighing about 52 lbs. per yard, and
825 tons, weighing about 53½ lbs. per yard, of the lat-
est and most approved patterns of T rail, for sale by
BOORMAN, JOHNSTON & CO.,
119 Greenwich street.
New York, Feb. 25, 1850.

N.B.—B. J. & Co are also prepared to take con-
tracts for English rails, delivered in any of the Atlan-
tic ports of the United States.

Railroad Iron.
THE UNDERSIGNED, HAVING made arrange-
ments abroad, are prepared to contract for the de-
livery of Foreign rails, of approved brands upon the
most favorable terms.
They will also make contracts for American rails,
made at their Trenton works, from Andover Iron, in
whole or in part, as may be agreed upon.
They are prepared to furnish Telegraph, Spring and
Market Wire; Braziers and Wire Rods; Rivets and
Merchant Bars to order, all made exclusively from An-
dover Iron. The attention of parties who require iron
of the very best quality for special purposes, is respect-
fully invited.
COOPER & HEWITT,
17 Burling Slip, New York.
February 15, 1850.

Glendon Refined Iron.
Round Iron, Band Iron, Hoop Iron,
Square " Flat " Scroll "
Axles, Locomotive Tyres,
Manufactured at the Glendon Mills, East Boston, for
sale by **GEORGE GARDNER & CO.,**
5 Liberty Square, Boston, Mass.
Sept. 15, 1849. 3m37

**PATENT HAMMERED RAILROAD, SHIP &
BOAT SPIKES.**—The Albany Iron Works
have always on hand, of their own manufacture, a
large assortment of Railroad, Ship and Boat Spikes
from 2 to 12 inches in length, and of any form of head.
From the excellence of the material always used in
their manufacture, and their very general use for rail-
roads and other purposes in this country, the manu-
facturers have no hesitation in warranting them fully
equal to the best spikes in market, both as to quality
and appearance. All orders addressed to the subscrib-
ers at the works will be promptly executed.

JOHN F. WINSLOW, Agent.
Albany Iron and Nail Works, Troy, N. Y.
The above Spikes may be had at factu- prices, of
Erastus Corning & Co Albany; Merritt & Co., New
York; E. Pratt & Brother, Baltimore Md.

**LAP—WELDED
WROUGHT IRON TUBES**
FOR
TUBULAR BOILERS,
FROM ONE AND A QUARTER TO SEVEN
INCHES IN DIAMETER.

THE ONLY Tubes of the same quality and man-
ufacture as those so extensively used in England,
Scotland, France and Germany, for Locomotive, Ma-
rine and other Steam Engine Boilers.
THOMAS PROSSER & SON, Patentees,
28 Platt street, New York.

Railroad Iron.
THE UNDERSIGNED ARE PREPARED to
contract for the delivery of English Railroad Iron
of favorite brands, during the Spring. They also re-
ceive orders for the importation of Pig, Bar, Sheet, etc.
Iron.
THOMAS B. SANDS & CO.,
22 South William street,
New York.
February 3, 1849.

Iron Store.
THE Subscribers, having the selling agency of the
following named Rolling Mills, viz: Norristown,
Rough and Ready, Kensington, Triadelphia, Potts-
grove and Thorndale, can supply Railroad Companies,
Merchants and others, at the wholesale mill prices for
bars of all sizes, sheets cut to order as large as 58 in.
diameter; Railroad Iron, domestic and foreign; Loco-
motive tire welded to given size; Chairs and Spikes;
Iron for shafting, locomotive and general machinery
purposes; Cast, Shear, Blister and Spring Steel; Boil-
er rivets; Copper; Pig iron, etc., etc.
MORRIS, JONES & CO.,
Iron Merchants,
Schuylkill 7th and Market Sts., Philadelphia.
August 16, 1849. 1y33

Railroad Iron.
THE MOUNT SAVAGE IRON WORKS, AL-
legany county, Maryland, having recently pass-
ed into the hands of new proprietors, are now prepar-
ed, with increased facilities, to execute orders for any
of the various patterns of Railroad Iron. Commu-
nications addressed to either of the subscribers will have
prompt attention. **J. F. WINSLOW, President.**
Troy, N. Y.
ERASTUS CORNING, Albany!
WARREN DELANO, Jr., N. Y.
JOHN M. FORBES, Boston.
ENOCH PRATT, Baltimore, Md.
November 6, 1848.

Railroad Iron.
THE SUBSCRIBERS ARE PREPARED TO
take orders for Railroad Iron to be made at their
Phoenix Iron Works, situated on the Schuylkill Riv-
er, near this city, and at their Safe Harbor Iron Works,
situated in Lancaster County, on the Susquehanna
river; which two establishments are now turning out
upwards of 1800 tons of finished rails per month.
Companies desirous of contracting will be promptly
supplied with rails of any required pattern, and of the
very best quality.
REEVES, BUCK & CO.
45 North Water St. Philadelphia.
March 15, 1849.

Monument Foundry.

A. & W. DENMEAD & SON,
Corner of North and Monument Sts.,—Baltimore,
HAVING THEIR
IRON FOUNDRY AND MACHINE SHOP
In complete operation, are prepared to execute
faithfully and promptly, orders for
Locomotive or Stationary Steam Engines,
Woolen, Cotton, Flour, Rice, Sugar Grist, or Saw
Mills,
Slide, Hand or Chuck Lathes,
Machinery for cutting all kinds of Gearing.
Hydraulic, Tobacco and other Presses,
Car and Locomotive patent Ring Wheels, war-
ranted,
Bridge and Mill Castings of every description,
Gas and Water Pipes of all sizes, warranted,
Railroad Wheels with best faggotted axle, fur-
nished and fitted up for use, complete
Being provided with Heavy Lathes for Bor-
ing and Turning Screws, Cylinders, etc., we can
furnish them of any pitch, length or pattern.
Old Machinery Renewed or Repaired—and
Estimates for Work in any part of the United States
furnished at short notice.
June 8, 1849.

Iron Wire.

REFINED IRON WIRE OF ALL KINDS,
Card, Reed, Cotton-flyer, Annealed, Broom,
Buckle, and Spring Wire. Also all kinds of Round,
Flat or Oval Wire, best adapted to various machine
purposes, annealed and tempered, straightened and
cut any length, manufactured and sold by
ICHABOD WASHBURN.
Worcester, Mass., May 25, 1849.

**Wheel, Forge and Foundry
Iron.**

LOCUST GROVE Wheel Iron of great strength
and superior chilling property.
Balt. Charcoal Forge Iron, from Patuxent, Curtis
Creek and Gunpowder furnaces.
Elkridge Foundry Iron, of superior strength and
softness. Anthracite and Charcoal Iron from Penn-
sylvania and Virginia. Gas and Water Pipes, Lamp
Posts from Elkridge furnace.
LEMMON & GLENN,
6m9 62 Buchanan's Wharf, Baltimore.

**S. S. Keyser & Co.,
IRON WAREHOUSE,**
Corner of South and Pratt Streets,
BALTIMORE, MD.

Selling Agents for the Rough and Ready Bar Iron
and Elk Boiler and Flue Iron Rolling Mills, Sarah
and Taylor Furnaces, and Wrightsville Hollow Ware
Foundry, and Dealers in Bar and Sheet Iron, and
Cast, Sheer, German, Blister, Spring and Electroplated
Steel, etc., etc.

Smith & Tyson,

GENERAL COMMISSION MERCHANTS,
No. 25 South Charles St., Baltimore, Md.

AGENTS for the Celebrated Columbia Pig Iron,
suitable for Car Wheels and Chilled Rolls.
Columbia refined Charcoal Blooms; Refined Char-
coal Juniata Billet Iron for Wire; Refined Iron for
Bridging, of great strength; Cut Nails, Spikes, and
Brads; Railroad Spikes and Wrought Chairs. 22tf

Stickney & Beatty,

**DEALERS IN IRON AND IRON
MANUFACTURERS.**

AGENTS for the Balt. City Rolling Mill, from
which establishment they are prepared to furnish
Ellicott's round, square, and flat bar iron, puddled
and charcoal boiler plates and billet iron—also agents for
the sale of the Laurel and Maryland (Balt.) charcoal
forge pig irons, Balt. hard iron for chilling wheels, an-
ti-fatam nails, Catocin foundry iron, boiler blooms
from the Caledonian works, Wm. Jessop & Son's cast
steel, Coleman's blister steel and mill rods, hoop, band,
sheet, oval and common English iron.
Nos. 18 and 20 South Charles st., Baltimore.

Railroad Iron.

CONTRACTS made by the subscribers, agents for
the manufacturers, for the delivery of Railway
Iron, at any port in the United States, at fixed prices,
and of quality tried and approved for many years, on
the oldest railways in this country.
RAYMOND & FULLERTON, 45 Cliff st.

Iron.

THE SUBSCRIBERS having resumed the agency
of the New-Jersey Iron Company, are prepared
to execute orders for the different kinds and sizes of
Iron usually made at the works of the company, and
offer for sale on advantageous terms—
150 tons No. 1 Boonton Foundry Pig Iron.
100 " No. 2 do. do. do.
300 " Nos. 2 & 3 Forge do. do.
100 " No. 2 Glendon do. do.
140 " Nos. 2 & 3 Lehigh Crane do. do.
100 " No. 1 Pompton Charcoal do.
100 " New-Jersey Blooms
50 " New-Jersey Faggotted Iron, for shafts
Best Bars, $\frac{1}{2}$ to 4 inch by $\frac{1}{2}$ to 1 inch thick.
Do do Rounds and Squares, $\frac{1}{2}$ to 3 inch.
Rounds and Squares, 3-16 to 1 inch.
Half Rounds, $\frac{1}{2}$ to 1 in. Ovals & Half Ovals $\frac{1}{2}$ to 1 $\frac{1}{2}$ in.
Bands, $\frac{1}{2}$ to 4 inch. Hoops, $\frac{1}{2}$ to 2 inch.
Trunk Hoops, $\frac{1}{2}$ to 1 $\frac{1}{2}$ in. Horse Shoes & Nut Iron.
Nail Plates. Railroad Spikes.
**DUDLEY B. FULLER & Co., 139 Greenwith-
st. and 85 Broad-st.**

**WILLIAM JESSOP & SONS'
CELEBRATED CAST-STEEL.**

The subscribers have on hand, and are constantly re-
ceiving from their manufactory,
PARK WORKS, SHEFFIELD,
Double Refined Cast Steel—square, flat and octagon.
Best warranted Cast Steel—square, flat and octagon.
Best double and single Shear Steel—warranted.
Machinery Steel—round.
Best and 2d gy. Sheet Steel—for saws and other pur-
poses.
German Steel—flat and square, "W. I. & S." "Eagle"
and "Goat" stamps.
Genuine "Sykes," L Blister Steel.
Best English Blister Steel, etc., etc., etc.
All of which are offered for sale on the most favora-
ble terms by **WM. JESSOP & SONS,**
91 John street, New York.
Also by their Agents—
Curtis & Hand, 47 Commerce street, Philadelphia.
Alex'r Fullerton & Co., 119 Milk street, Boston.
Stickney & Beatty, South Charles street, Baltimore.
May 6, 1849.

**JOHNSON, CAMMELL & Co's
Celebrated Cast Steel,**

**AND
ENGINEERING AND MACHINE FILES,**
which for quality and adaptation to mechanical uses,
have been proved superior to any in the United States.
Every description of square, octagon, flat and round
cast steel, sheet, shovel and railway spring steel, best
double and single shear steel, German steel, flat and
square, goat stamps, etc. Saw and file steel, and steel
to order for any purposes, manufactured at their Cy-
clops Steel Works Sheffield.
JOHNSON, CAMMELL & CO.,
100 William St., New York.

November 23 1849.

Railroad Iron.

THE Undersigned, Agents for Manufacturers, are
prepared to contract for the delivery of English,
Welsh and Scotch Rails, of any pattern and weight,
also for every description of Welsh, Scotch and Swe-
dish Iron, Railway Chairs and Spikes, Rivets, Bolts,
Nuts, Washers, Chain Cables, Anchors, Tin Plates,
German Spelter, Iron Castings, and every description
of Machinery.

WILLIAM BIRD & CO.,
Iron and Tin Plate Merchants,
44 Wall st., New York.
And at 5 Martin's Lane, London,
and 140 Buchanan st., Glasgow.

July 27th, 1850.

**To the Proprietors of Rolling
Mills and Iron Works.**

**THE Undersigned—Proprietors of Townsend's Fur-
nace and Machine Shop, Albany—are extensively**
engaged in the manufacture of Machinery and fix-
tures for Iron, and Copper Rolling Mills, and Iron
Works. Having paid particular attention to the ma-
nufacture of *Rolls* (Rollers), both *chilled and dry-sand*,
they feel confident that they can execute orders for
such castings in a satisfactory manner. And to give
assurance of this, they beg leave to refer to the fol-
lowing named persons, proprietors and managers of some
of the most extensive rolling mills in the country, viz:
Jno. F. Winslow, J. Tuckerman, H. Burden, W. Burr,
J. & J. Rogers, Salsus & Co., J. B. Bailey, L. G. B.
Cannon, Hawkins & Atwater, etc., etc.

F. & T. TOWNSEND.
Albany, August 18, 1849,

Railroad Iron.

B. O. Railway Tires, Railway Wheels,
Scotch Pig Iron, Tin Plates and Banca Tin,
Muntz's Patent Metal Sheathing,
Baltimore Copper.

Contracts for Rails made on behalf of the manufac-
turers, for delivery at any ports in the United States,
at fixed prices.

Bowling Tires and Tire Bars and Scotch Pigs im-
ported to order.

Muntz's Ship-sheathing, and a general stock of Tin
Plates and Banca Tin in store, and for sale by
RAYMOND & FULLERTON, 45 Cliff st.

Bowling Iron. Stamped B.O.

Railway Tire Bars Rivet Iron
Locomotive and other Axles Locomotive Frame do
Boiler Plates Bars.
and every other description of this superior Iron.
The subscribers, agents for the sale of Bowling Iron,
are prepared to execute orders for importation, espe-
cially for railway and machinery uses, with despatch
from the manufacturers.
RAYMOND & FULLERTON, 45 Cliff st.

**Lovegrove's Patent Cast Iron
Water and Gas Pipes.**

THE Subscriber, the Inventor and Patentee of the
Centrifugal mode of giving form to metallic sub-
stances while in a molten state, is preparing to make
Cast Iron Water and Gas Pipes, of any dimensions,
at prices much lower than they can be made in the old
manner, and the pipes warranted to stand a pressure
of three hundred pounds to the square inch, and to be
soft enough to drill. Steam Engines and all kinds of
machinery. Cast Iron Doors and Frames, and Mill
Castings of every description, made to order.
THOMAS LOVEGROVE,
Machinist and Founder,
West Falls Avenue, below Pratt st., Baltimore.

Rosendale Cement.

**THE NEWARK and ROSENDALE LIME
AND CEMENT CO.** are now manufacturing at
their works in NEWARK, N. J., and Ulster county,
N. Y., a very superior article of *Hydraulic Cement*—
also Lime Calcine Plaster, etc. Contractors and deal-
ers will find it to their advantage to call or make ap-
plication before purchasing elsewhere. All communi-
cations addressed to the subscriber, at Newark, N. J.,
will be punctually attended to.
1y¹⁵ **HENRY WILDE, Secretary.**

Railroad Instruments.

THEODOLITES, TRANSIT COMPASSES,
and Levels, with Fraunhoffer's Munich Glasses,
Surveyor's Compasses, Chains, Drawing Instru-
ments, Barometers, etc., all of the best quality and
workmanship, for sale at unusually low prices, by
E. & G. W. BLUNT,
No. 179 Water St., cor. Burling Slip.
New York, May 19, 1849.

**American Railway Guide,
AND POCKET COMPANION FOR THE
UNITED STATES;**

CONTAINING Correct Tables, showing the time
for starting of trains from all stations, distances,
fares, etc., on all the Railway lines in the U. States;
also many of the principal Steamboat and Stage routes
—accompanied by a complete **RAILWAY MAP.** Price,
single copies 12 $\frac{1}{2}$ cts., or \$1 per annum. Published on
the first of every month, corrected from returns fur-
nished by the Railway Superintendents throughout
the Union.

This book has been compiled somewhat on the plan
of Bradshaw's Guide, with such improvements in size,
form and arrangement as have seemed desirable; and
the publisher confidently hopes it will not be found li-
able to the objections of incompleteness and incorrect-
ness, which have been made, and justly too, against
various other similar works heretofore issued.

The subscriber having had the management of the
NEW YORK PATHFINDER almost from its com-
mencement, has enjoyed superior facilities in obtain-
ing information relating to the thoroughfares of travel,
and is therefore well qualified to prosecute with suc-
cess the arduous undertaking of furnishing a complete
and correct national guide book.

STRINGER & TOWNSEND, General Agents,
222 Broadway: and sold also by Booksellers and Peri-
odical Dealers generally throughout the country; also
on all the Railways and Steamboats.

CURRAN DINSMORE, Publisher.
N. Y. Pathfinder Office,
133 Fulton St., New York City.

FARMERS! ATTENTION!!**John Mayher & Co's**NEW AGRICULTURAL WAREHOUSE
AND SEED STORE.

197 WATER STREET, NEW YORK.

Where they have for Sale, the largest and most complete assortment of Farming Implements, ever offered for sale in this city—all of which they will sell 10 per cent. Cheaper than the same kind of Goods can be bought at any other house in the city. Our Goods are all Warranted to give satisfaction.

FARMERS wanting to purchase, will please call and examine our Stock before buying elsewhere.

Among our assortment may be found the Celebrated Highest Premium Eagle Ploughs! together with all the most approved Ploughs now in use.

Also,—Horse Powers, Threshing Machines, Fan Mills, Corn Shellers, Straw Cutters, Corn Mills, Seed Sowers, Churns, Ox Yokes, Ox Scrapers, Hay Rakes, Horse Rakes, Patent Chain Pump (that never freezes nor rusts), and other Pumps; in fact we have everything for Farming Purposes—together with Guano, Bone Dust and other Fertilizers.

JOHN MAYHER & CO.,
197 Water st., N. Y.

February 9, 1850.

N.B.—J. M. & Co. also continue their Old Stand, at 195 Front street, near Fulton Market.

**RAILROAD CAR
AND COACH TRIMMINGS.****Doremus & Nixon,**

IMPORTERS AND FURNISHERS

HAVE FOR SALE

Plain Garnet Plush. Fig. Garnet Plush (Butterfly pat.
"Crimson " "Crimson " (Elegant.
"Scarlet " " " " (Gen. Taylor.

BROCATELLES.

Crimson Silk Brocatelles. Gold and Maroon do.
Gold and Blue " " Brown "
Silk and Wool " of every color.

MOQUETTS,

Of elegant designs and colors.

GERMAN CLOTH FOR CAR LININGS.

The most beautiful goods ever shown in this country, and the subscribers are the sole agents for the sale of them.

Oil cloths Enamelled with Gold. } These goods can be
" " Silver. } furnished in any
Do. Silver ground velvet printed. } dimensions req'd.

CURLED HAIR

Of every description and quality.

JNO. W. A. STRICKLAND, Agent.
New York, 1850. ly16**FOWLER M. RAY'S
Patent India-rubber Railroad
CAR SPRING.**

New York and Erie Railroad Shops.

Piermont, March 26, 1850.

This will certify that from practical experience in the use of Fowler M. Ray's India rubber Car Springs, I believe them to be far superior to any others now in use.

I have never known them to be affected by any change of temperature, as other Rubber Springs have been affected on this road.

I am at the present time repairing a Passenger Car that Mr. Ray, and myself mounted with his springs about two years and eight months since.

The springs are at the present time as perfect, to all appearances, as when first applied to the car.

Respectfully yours,

HORACE B. GARDNER,
Foreman of the Car Shops.Supt. Office N.Y. & H. R.R., }
New York, March 8, 1850. }

This is to certify that we have used the Rubber Springs manufactured by Mr. F. M. Ray for the past twenty months, "both for Passenger and Freight Car Springs and Bumpers, and of different sizes," and have in every case given entire satisfaction, and I consider them the best spring now in use.

M. SLOAT, Supt.

Boston, March 5, 1850.

In answer to your enquiry about India-rubber Springs, I have to say that we have used them to a considerable extent on both freight and passenger cars, and also on several of our tenders; and I am very well satisfied that they answer all the purposes for which they are intended. I believe the India-rubber will soon supersede all other springs for cars and tenders.

Yours truly,

S. M. FELTON,
Supt. Fitchburg Railroad.Office New Jersey Railroad Co., }
Jersey City, March 8, 1850. }**FOWLER M. RAY, Esq.,**

Dear Sir: In answer to your enquiries respecting the operation of the Vulcanised Rubber Springs, purchased by our company from you some two years since, I reply that they are superior to any spring in use, (that I have either seen or heard of).

The improved form of your spring, consisting of a solid piece of vulcanised rubber with bands on the outside, is far superior to your first form, consisting of disks of rubber with metallic plates interposed.

The last named form was tried, if you recollect, at a much earlier period; and then was replaced by your last form.

I have no hesitation in saying that your springs have given entire satisfaction, and most cheerfully recommend them to railroad companies throughout the country for the following reasons:

1st. The cost is 30 per cent. less.
2d. Saving of weight on each car of 8 wheels from 700 to 800 lbs.

3d. Less care and attention is required, as they are not liable to get out of repair.

4th. A great saving is secured in the wear and tear of the cars and rails from their great elasticity.

5th. The freedom from noise.

6th. There is greater safety in case of accident, as they cannot be broken.

7th. The comfort of passengers is enhanced sufficiently to pay the expense, waiving all the other reasons that I have given.

Should this fail to satisfy any person enquiring, you are at liberty to refer to me, No. 150 Washington St., Jersey City. Yours respectfully,

T. L. SMITH, Supt.

New York, March 11, 1850.

I have used the Patent India-rubber Spring purchased of Mr. Ray, upon the cars of the New York and New Haven Railroad, and have found them efficient and economical; and when applied to the axles and draw springs, believe them to be quite equal to any in use. I have found a combination of these springs with a steel spring under the transom beam a very satisfactory arrangement, and am now using this plan in all new cars.

Yours respectfully,

ROBERT SCHUYLER.

February 25, 1850.

From practical observation of the use of the India-rubber Car Springs, manufactured and sold by your company, we are entirely satisfied in their application, and do not hesitate to recommend them as elastic, durable, requiring no repairs for years, and retaining their consistency during all extremes of weather. We have applied them for the past two years, and consider them superior for all railroad purposes.

Yours truly,

OSGOOD BRADLEY, Car Builder, Worcester.
T. & C. WASON, do. Springfield.
DEAN, PACKARD & MILLS, do. do.
DAVENPORT & BRIDGES, do. Cambridgeport.Office of the New Jersey Railroad Co., }
Jersey City, March 7, 1850. }

This is to certify that we have had Mr. F. M. Ray's India-rubber Springs in constant use under our cars, and as Bumper Springs for upwards of two years, and they have in every way given perfect satisfaction.

The present form of spring we deem far superior to the form of Disk, having used both forms, although we have none of those made in Disks at present in use.

We take pleasure in recommending these springs to all railroad companies.

J. P. JACKSON, Vice Pres.
New Jersey Railroad and Trans. Co.

Roxbury, February 28, 1850.

In compliance with your request, I take great pleasure in stating the result of my experience in the use of "Ray's Patented Vulcanised India-rubber Car and Engine Springs." We have used them nearly two years, and never had one fail in any way. The cold weather does not affect them, as it has other rubber springs we have used.

With sixteen years' experience as superintendent of machinery on the Boston and Providence railroad, I take pleasure in saying that your springs are the best we ever used, or I ever saw used elsewhere. We have 20 cars rigged with them, of which I can say that the springs are as good now as when first applied. I put 24 lbs. of the rubber under the forward end of one of our heaviest engines, taking off 250 lbs. of steel springs—it has been in use 18 months, and is in as good condition now as when first put under the engine.

Very respectfully yours,

GEO. S. GRIGGS,
Supt. of Machinery, Boston and Prov. R.R.

Fall River, February 2, 1850.

In answer to yours of the 20th ult. I would say that this company has for some 10 or 12 months past been using "Ray's India-rubber Springs." We have applied them to both passenger and freight cars with uniform success. They have invariably preserved their elasticity and consistency through all the extremes of weather; and we are now applying them whenever the steel spring fails. I am well satisfied that they are particularly adapted for railroad purposes.

Very respectfully yours,

GEO. HAVEN,
Supt. Fall River Railroad.

Jersey City, March 9, 1850.

This is to certify that the present form of Mr. F. M. Ray's India-rubber Car Spring I consider far superior to the form of Disk, having used both forms.

I take pleasure in recommending these springs to all railroad companies. **DAVID H. BAKER,**
Foreman of Car Shop of N.J. R.R. & Trans. Co.

Harlem R.R. Depot, }
New York, March 7, 1850. }

This is to certify that we have used Mr. F. M. Ray's India-rubber Springs for over eighteen months, and find them to be easy and durable, and recommend them to railroad companies, as being superior to anything we have tried.

J. M. SMART,

Foreman at 42d St. Depot.

Old Colony Railroad Office,
Boston, March 6, 1850.**EDWARD CRANE, Esq.,**

President New England Car Co.,

Dear Sir: In compliance with your request I would state that the Old Colony Railroad Compy have had in use upon their road, India-rubber Springs furnished by your company, for more than eighteen months past, during which time they have been extensively used under Passenger and Freight Cars, Locomotive Tenders, and for Drawer and Buffering Springs, with the most perfect success. The elasticity and consistency of the Rubber has never been unfavorably affected by either extremes of heat or cold—and from the experience which we have had in the use of Rubber Springs, I think them well adapted for railroad purposes—and therefore we have for some months past used Rubber almost exclusively, in all places where springs are required.

Respectfully yours, etc.,

JAS. H. MOORE,
Supt. O. C. Road.

Troy, February 27, 1850.

We have been using your India-rubber Car Springs for nearly two years—and we take pleasure in saying that in our opinion the rubber has to a certain extent already, and may eventually entirely supersede all other Springs for Railroad Car purposes. We now use it entirely for Draw Springs and Bumpers, considering it better and lighter than steel.

During our two years' experience in the use of it, we have not known any to lose their elasticity, or fail in any way; and we cheerfully recommend the rubber for railroad car springs. Very respectfully,

EATON, GILBERT & CO.**Passenger Car Linings.**

THE Advertiser continues to make to order the Enamelled Car Linings which have been so highly approved the last three years, and are now exclusively used by all the Northern Railroads. No pains are spared to get out new styles, and adapt them to the tastes of every consumer.

Orders addressed to **CHARLES STODDER, No. 75 Kilby street, Boston,** will have prompt attention. March 23, 1850. 2m

India-rubber for Railroad Cos.

RUBBER SPRINGS—Bearing and Buffer—Fowler's Patent—Hose from 1 to 12 inches diameter. Suction Hose, Steam Packing—from 1-16 to 2 in. thick. Rubber and Gutta Percha Bands. These articles are all warranted to give satisfaction, made under Tyer & Helm's patent, issued January, 1849.—No lead used in the composition. Will stand much higher heat than that called "Goodyear's," and is in all respects better than any in use. Proprietors of railroads do not be overcharged by pretenders.

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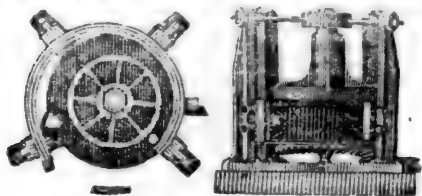
New York, May 21, 1849.

Spikes, Spikes, Spikes.

ANY person wishing a simple and effective Spik Machine, or a number of them, may be supplied by addressing **J. W. FLACK,**
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Railroad Spikes and Wrought Iron Fastenings.

THE TROY IRON AND NAIL FACTORY, exclusive owner of all Henry Burden's Patented Machinery for making Spikes, have facilities for manufacturing large quantities upon short notice, and of a quality unsurpassed.

Wrought Iron Chairs, Clamps, Keys and Bolts for Railroad fastenings, also made to order. A full assortment of Ship and Boat Spikes always on hand.

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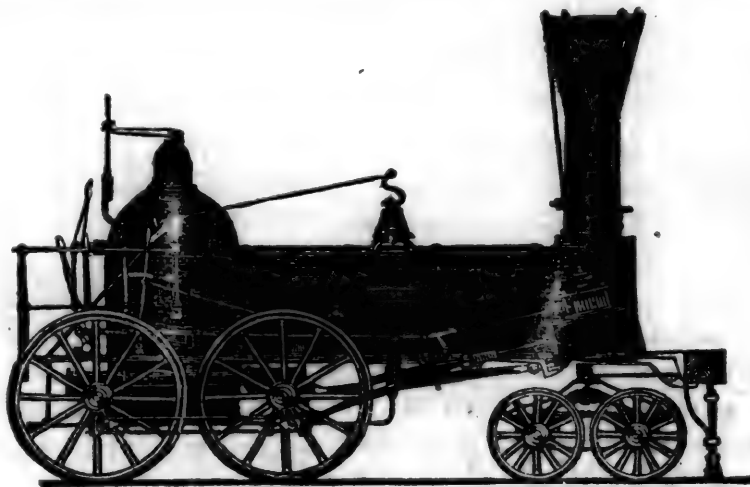
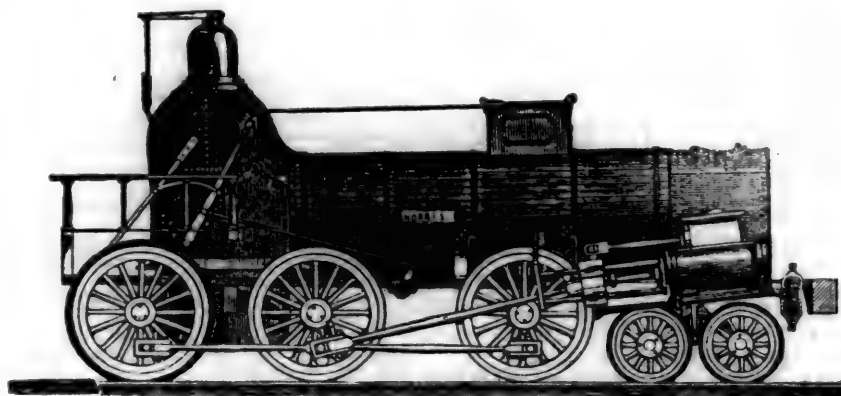
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Iron and Brass castings, Axles, etc., fitted up complete with Trucks or otherwise.

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THIS superior article for igniting the charge in wet or dry blasting, made with DUPONT'S best powder, is kept for sale at the office and depot of

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And in the principal cities and towns in the U. States.

The Premium of the AMERICAN INSTITUTE was awarded to the Etna Safety Fuse at the late Fair held in this city.

November 3, 1849.

1y

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To Inventors and Patentees.

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AMERICAN RAILROAD JOURNAL.

STEAM NAVIGATION, COMMERCE, MINING, MANUFACTURES.

HENRY V. POOR, Editor.

ESTABLISHED 1831.

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ASSISTANT EDITORS,

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GEN. CHAS. T. JAMES, *For Manufactures and the Mechanic Arts.*
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American Railroad Journal.

PUBLISHED BY J. H. SCHULTE & Co., 136 NASSAU ST.

Saturday, August 17, 1850.

An Essay on Pen and Pocket Cutlery,
Embracing a Detailed Description of the Mechanical, Chemical, and Manual Operations Performed on Certain Raw Materials, to Convert them into the Means, Implements, and Materials, for Manufacturing Pen and Pocket Knives.

BY A. L. HOLLEY.

CHAPTER IX.—VIEW OF A CUTLERY ESTABLISHMENT TEN YEARS HENCE. SILVER BACK AND OTHER KNIVES. SILVER. TIN. GOLD. COVERING.

Continued from page 500.

Perhaps there is no more showy, brilliant and beautiful work of art in the world, than a fine, well-proportioned, well made knife. In a gold watch, all is yellow metal; a steam engine, though complex, is heavy and large, and usually exhibits the same material, if not an uniformity of color; but a

knife, with the graceful lines of its parts, with its scales reflecting from every point the figure of its richly worked springs, the backs radiant with mill-ed and burnished silver, or gold, the highly polished and massive bolsters, the brilliant shield and rivet heads contrasting with the gold, the jet and the crimson of its shell, the delicacy and the regular concavity of its glittering pen blades, the splendor, the perfect and nicely proportioned figure, and the fine and even edge of the pockets, which seem to be almost unable to restrain themselves from severing everything in their reach; all these are some of the exquisitely beautiful spectacles, which none but a cutler's eye can sufficiently admire, and no one except the cutler and the whittler can fully appreciate. There is almost as much expression in a perfect knife as in a painting or a face. To an experienced eye, every line, every indentation, and every prominence, go to make up and exhibit the character of the article. Fashion and taste, however, have laced up some patterns, till their proportions are distorted, and they are fit for no practical purposes.

Let us now look at some other substances which are used in the manufacture of knives. The middle scales of many jack knives are made from sheet tin, instead of plain sheet iron. Tin, a metal which has long been known, was probably used as early as the time of Moses, and was generally obtained by the ancients from Spain and Britain. It is not abundant in all countries, but is found in Malacca, Chili, Mexico, Galicia, Portugal, Saxony and Bohemia, and in the greatest quantities in Cornwall, England. The most abundant ore of tin is its peroxide, called "tin stone," and the other called "bell metal ore," is the double sulphuret of tin and copper, and is extremely rare. The purest tin is found in grains, in the alluvial soil, and called stream tin, though the ore more generally occurs in veins, and is reduced by grinding, washing and roasting in reverberatory furnaces, then by mixing with charcoal and a flux of limestone.—The heat is kept up from eight to ten hours, which causes some of its impurities to combine with the lime, and to escape in scoria, while the tin is cast in clay moulds. The tin is then fused and runs off, while the heavier part of the drop remains. Wet charcoal is plunged into the tin while in fusion, which causes the remaining impurities to rise to the top. The ores usually contain oxides of iron and manganese. Iron sheets will be covered with

a thin coating of tin, if dipped therein while in fusion, and in this state they are used for knife scales. Tin in its pure state is very white and brilliant, though it is partially tarnished by the action of the atmosphere. It has a slight taste, and smell when rubbed, and its hardness is intermediate between gold and lead. Its ductility and tenacity are inferior to most metals, though it is highly malleable. A tin wire of thirty-seven thousandths of an inch in diameter, will hardly sustain 37 lbs. Its specific gravity is 7.2, its point of fusion 442° Fahr., and its equivalent is 58. Silver, as before shown, is quite extensively used in fine knife making, and is a metal which was known to the ancients, and is found in large quantities in South America, as well as in other countries. It is reduced from its sulphurets, and is found in its native state. It is white, malleable, ductile and tenacious. Its specific gravity is 10.5, and its equivalent 110. Gold is the most valuable and longest known of the metals. Its specific gravity is 19.3, its equivalent 200, and it may be beaten till only one 290 thousandths of an inch in thickness. A grain of gold may be drawn out into a wire 500 feet in length. Gold is always found in a metallic state, either with or without other metals, hence there is no such thing as an ore of gold. Ivory, used extensively for covering, is the material of the tusk or the male elephant. It is less brittle, but more compact, hard and white, and receives a much finer polish than bone. It consists of about 24 per cent. of animal matter, similar to bone, 66 phosphate, and some traces of carbonate of lime. India and Ceylon produce the greatest quantities of ivory, though this is considered inferior to that of Africa in closeness of texture and in color. Yellow ivory is used only for the most common purposes, while that which is slightly blue is highly valuable. The average weight of tusks is about 60 lbs., tho' "scrap ivory" which comb and table knife makers leave, is generally used for pen and pocket knives.

No European or American artist has as yet succeeded in cutting and working ivory as well as the Chinese, though ivory articles are more successfully manufactured at Dieppe than at any other European town.

Mother of pearl, a substance extensively used, and highly valued as covering, consists of the shells which surround pearls, and are composed of the carbonate of lime. They are found on the coasts of Ceylon, Coromandel, and the Bahrein islands, in

the Gulf of Persia, the West Indies, and in the South sea. They are excessively hard, and cannot be softened, therefore work very hard, and are very liable to crack. Cutlers receive an additional price for working pearl, and converting it into knife handles, on this account. Stag horns are much used for covering, and are preferred by many to smooth handles. These horns are used by the stag as weapons, are called antlers, consist of bone, and during formation are surrounded with a hairy and vascular covering, which when the horn is fully grown cracks and is rubbed off by the animal.—Scales for knife handles are cut from the outside of the horns, and polished by a brush. They can be made straight by bending them while hot. Buffalo horns are used for similar purposes, and are either jet black, or variegated with grey and white. They are sawn into straight strips of proper size when sufficiently solid and thick, but when otherwise they are pressed into shape while heated. Ox horns are occasionally converted into the scales for cheap knives, either by pressing them in moulds till they are properly shaped, or by sawing them into straight flat strips. They are sometimes transparent, and are placed over printed verses and mottoes, or gold leaf. "Horn partakes of the chemical nature of the cartilaginous part of the bone," and consists chiefly of albumen with some phosphate of lime and a little gelatine. German silver, brass, iron, live oak, and some West Indian and South American woods are also much in use for knife handles, and any wood can be used, provided it is sufficiently hard and compact to receive a rottenstone polish.

To be continued.

Rights of Patentees.

Circuit Court of the United States for the Northern District of New York. July Term, 1850. Before his Honor Judge Conklin.

Peter A. Burden vs. Erastus Corning and John F. Winslow.—This was an action brought for the violation by the defendants of patent granted to Henry Burden, of Troy, on the 10th of December, 1840. The trial commenced on Monday, the 1st of July, 1850, and closed on Friday of the same week.

The defendants set up three grounds of defence:

1st. That the patent was void for multiplicity of claim.

2d. That it was void for want of novelty.

3d. That the defendants had not infringed.

To sustain the second ground of defence the defendants introduced a patent for a machine for making bullets by pressure, granted to Thomas Bruff, in 1813, and proved its use in Washington city in 1811, and also introduced reciprocating and rotary machines for milling the edges of buttons used in Waterbury, Connecticut, as early as 1832, and also reciprocating and rotary machines for milling the edges of coin used in the mint of the United States at Philadelphia as early as 1833.—The Bruff machine rolled bullets of lead between a revolving cylinder and a stationary curved segmental trough, the surface of the trough gradually approaching the surface of the cylinder, and the peripheries of both being grooved.

Upon the objection that the patent was void for multiplicity of claim, the Judge ruled in favor of the plaintiff. Upon the other points raised by the defendants the Court charged the Jury as follows, and under those instructions the Jury rendered a verdict for the plaintiff of \$100:—

1. That the patent is for a new process, mode or method of converting Puddler's balls into blooms by continuous pressure and rotation of the ball between converging surfaces, thereby dispensing with the hammer, alligator jaws and rollers accompanied with manual labor, previously in use to accomplish the same purpose, and that the patent secures to the patentee the exclusive right to construct, use and vend, any machine adapted to accomplish the objects of his invention as above specified.

2. That the machines for milling buttons, milling coin, and rolling shot, do not show a want of novelty in the invention of the patentee as above specified, because the process used in them, the purpose for which it was used, and the objects accomplished by them were substantially different from those of Burden's patent.

3. That the machine used by the defendants is an infringement on the plaintiff's patent if it converts puddler's balls into blooms by the continuous pressure and rotation of the balls between converging surfaces, although its mechanical construction and action may be different from the machine used by the plaintiff; and under these instructions the Jury, without retiring, rendered a verdict for the plaintiff of \$100. (Which amount was previously agreed on by the counsel for the respective parties, the plaintiff having been the owner of the patent but a few days when the suit was brought.)

The defendant's counsel excepted to the charge of the learned Judge.

H. B. Stanton and Sam'l Stevens, Esqrs., counsel for plaintiff.

D. L. Seymour, Sam'l. Blatchford, C. M. Keller, A. Worden and J. A. Spencer, Esqrs., counsel for defendants.

American Iron Manufacture.

Below we give the memorial of the Pennsylvania Iron Manufacturers to Congress for increase of duty on iron:

MEMORIAL.

To the Senate and House of Representatives of the United States of America, in Congress assembled:

Your memorialists, interested in the manufacture of iron in the State of Pennsylvania, ask leave to offer some considerations and statements suggested by the suffering condition of that industry. We are not unaware of the prejudice which exists in the minds of many against the propriety of the government giving any attention to the grievances of manufactures; neither are we ignorant of the grounds of this feeling.

It is a part of our purpose in this memorial, to lessen, if we cannot wholly remove this prejudice. On a subject of so much importance, involving so many interests, in a country so extended as ours, it is to be expected that honest differences of opinion will exist, and sectional, if not clashing, claims will arise. The manufacturers of this country, whatever may be their troubles, must yield with all their fellow-citizens, to that system of compromise on which all our institutions are adjusted. We cannot ask any legislation for our advantage unless it be, if not equally for the benefit, at least not injurious to the rest of the community. On this ground we are willing to base our present application for relief. We come, without distinction of party, and ask to be heard upon strictly national considerations, that if any enactment is consequent upon our petition, it may be regarded as permanent and not partial legislation. We ask not for relief to-day which may be withdrawn to-morrow; but for a settled policy. We ask to have the wisdom of all interests and all parties applied to the preparation of such a system as will be permitted to stand, subject only to the improvements which experience and time may dictate.

It cannot be questioned, that a large supply of iron is necessary to the rapid progress of any country in all departments of industry and the arts, in civilization and the material well-being of the people. The production of iron in Great Britain is equal to that of all Europe beside; while her consumption is equal to a million and a third of tons, or about 100 lbs. to each individual of her population. Belgium falls little, if any, short of an equal consumption for each inhabitant. Sweden would stand next in order, but that she exports so much of her iron, as to remain far behind Belgium in proportionate consumption. France consumes about 30 lbs. to each person, and of this, about one-tenth is imported. The rest of Europe does not consume 10 lbs. each person, and the remainder of the old world does not reach a consumption of 5 lbs. In this respect, the enterprise and industry of the people of the United States have not permitted

them to remain behind; so that despite of obstacles the most formidable, and the most vacillating legislation, we stand in the front rank of nations as to the consumption of iron. Our consumption is equal to that of Great Britain for each inhabitant; but we import about two-tenths of the quantity consumed. Such is the abundance of raw materials, such the enterprise of our people, such the tendency to employ iron, and so greatly are the facilities for transportation multiplying, that we might with certainty outstrip the world in its production. All that is needed to secure such a result is a steady home market. Pennsylvania now produces as much iron as Great Britain did in 1820; her product was doubled in ten years, under great disadvantages; and in ten years of favoring legislation, it might be doubled again. Pennsylvania now produces as much iron as France; more than Russia and Sweden united; and more than all Germany. Yet, how many States of the Union will, ere long, manufacture as much as Pennsylvania; for there are few in which the raw material do not abound. Our population is destined to increase in a very rapid ratio; under a wise policy, the production of iron would far more than keep pace, until we should be finally as much distinguished for the consumption of iron as we are now for the production of cotton.

The policy of purchasing only in the cheapest market sends not only the people of the United States, but of all the continent of Europe, and, in fact, of all the world, to Great Britain for iron; for there the cost of making is one-half less than here, and in still greater disproportion with most other nations. The difficulty is, that the manufacturers and merchants of that country are not governed by the cost of their production in selling their commodities, but by the extent and urgency of the demand. When there is a demand, the prices is at the highest; when there is not, the world is invited to a cheap market.

If it be objected to such a development of the manufacture of iron, that the cost of production is too great in the United States, and that we ought rather to import that which is purchased cheaper in other countries; the reply may be made that, Great Britain being the only country in which iron is sold at lower rates than here, our demand could only go to that market; that if sound economy requires us to obtain our supply of iron in Great Britain, the same motive would send all other nations to the same market. But our orders alone could not be filled without raising the price, as to preclude all possibility of our obtaining a full supply. If we should order from Great Britain in one year, additionally, half the quantity of iron we now manufacture, prices would go higher than they have been for a century, in England or America. The British iron market is cheap when you refrain from it, not when you press upon it. The cost of manufacturing iron is far from being the only, or even the chief controlling element of the price. The manufacturer and holder of iron in Great Britain are extremely sensitive to a demand for any increased quantity of iron, or to any increased urgency of demand, whether from abroad or for home consumption.

A million of tons of iron—which is the amount of our consumption when the industry of the country is suffering under no depressing causes—would have cost Great Britain, in 1843, at the prices then prevailing, (taking half the amount in pig, and half as bar iron,) £3,500,000 sterling. In 1846, the same quantity would have cost £9,000,000 sterling, at which prices it was more economical to manufacture than to import. These high prices gave an immense impulse to the production of this country, and showed how promptly capital and enterprise combined to overcome an emergency by which the country was threatened with a deficiency of the indispensable article of iron.

Had we even a stipulation, by treaty, on the part of the government of Great Britain, that we should always be furnished with iron in that market at the low rates now current, say a million of tons for \$20,000,000, how could we pay for it? We already import more than we can pay for in exports.

All the shrewdness and enterprise of our merchants are constantly at work to increase our exports; not only is every thing exported that will pay a profit, but every article that will pay a

freight. How absurd to suppose we could pay \$20,000,000 additional for iron. Any attempt to supply ourselves with iron from abroad would, if persevered in, reduce our consumption from 100 lbs. for each person to far less than half that quantity, besides abridging our imports of other articles, and wholly deranging our foreign commerce.

As manufacturers of iron, we freely admit that we enjoy in Pennsylvania, and, we may add, in all the United States, very manifold natural advantages. If we could now boast that exemption from injurious rivalry, enjoyed by the British manufacturers, during the rapid growth of their industry, we could safely promise even greater results than we have witnessed elsewhere. Look for a moment, at the circumstances under which the British manufacture of iron was developed.—There was no surplus of pig iron in any country of Europe, and the article was unknown in European foreign commerce. All that England ever imported was a few thousand tons from the colonies of Pennsylvania, Maryland, and Virginia; and this was finally cut off by our revolution. The English manufacturer of pig iron has no rival, and required no protection. The only competitors in bar iron were Russia and Sweden; their prices, from 1780 to 1849, ranged from £12 to £25 per ton. But as if this high price was not ample protection to British manufacturers, the government advanced the duties fifteen times, between 1780 and 1820, without one reduction, increasing them from £2 10s to £7 per ton, affording the double protection of high prices, and constantly increasing duties.

Between 1780 and 1825, Russian and Swedish bars could not be imported and sold in England for less than £20 or £100 per ton; this gave the English manufacturers entire possession of the home market for all purposes to which their iron was applicable, and yet their price was always below the foreign.

In contrast with this, the American maker of bar iron competes with rivals whose average home price is only £8 or \$40 per ton, and who, at present rates of iron in the British markets, and duties here can put their bars in our market at \$40, duty paid. It is true, they lose money by the operation, but they would lose more by selling at home, and thus further depressing the markets in which they must sell three times as much as they export. Thus they preserve their own and ruin the markets of their competitors. During the rise of this manufacture in Great Britain, pig iron was worth in their market over 100 shillings—generally 100 shillings. The American manufacturer encounters pig iron sold in Scotland for years together at from 35 to 45 shillings, and which can be put down in our markets, duty paid, at 60 to 70 shillings.

If we ask relief against such ruinous competition, we derive countenance from the fact, that British manufacturers constantly appealed to the government for protection under the favorable circumstances we have noted. We have seen with what success. The time was not long until, in 1825, the manufacture had attained ample growth and power, it could dispense with all aid, and defy competition. Great Britain had then risen to the rank of the largest consumer of iron in the world.

To be Continued.

English Cotton and Woollen Manufacture.

Below we give from authentic data the following statistics relative to the cotton and woollen manufacture of England:

The Cotton manufacture has its chief seat in Lancashire, and the neighboring shires of the north midland, and the material is imported through Liverpool, where is the market, and the goods are exported by Liverpool, London, and Hull. To show the full working of the cotton manufacture, the returns of 1847, 1848, and 1849, are not sufficient, as those were years of depression.

The import of cotton wool in 1845, which was its height, was 731,979,953 lbs., whereof 626,650,412 lbs from the United States, but 42,916,332 lbs were exported.

The worth of cotton manufacture exported from Great Britain in 1846 was £16,701,632; hosiery, lace, and small wares, £1,016,146; cotton, twist,

and yarn, £161,892,750 lbs., £7,882,048; altogether, £25,599,526, besides cotton mixed with other manufactures.

In 1835, the number of cotton factories in England was 1262, whereof in Lancashire, 715; Cheshire, 116; York West Riding, 126; and most of the others in Derby. The number of persons employed was 182,092, whereof in Lancashire, 122,415; Cheshire, 31,512; West Riding, 10,911; Derbyshire, 10,850. The chief cotton towns are Manchester, Stockport, Hyde, Duckenfield, Oldham, Bolton, and Glossop.

In 1839, the whole number of mills was 1686, and of persons employed, 218,136; four-fifths of the power being supplied by steam, equal to 40,590 horse power. In 1847 there were 1987 mills, and 277,028 persons employed. In 1841, the number of persons employed in cotton manufactures, as given by the census, was about 320,000, of whom more than half were females, and two-thirds above 20 years of age.

This is exclusive of the hosiery manufacture, in which cotton is chiefly used, and in which nearly 50,000 persons were employed in 1841, of whom three-fourths were males. Nottingham is the chief seat of this branch, with Derby, [silk,] and Leicester, [wool.]

Much cotton is worked up into lace and bobbinet. In 1841, about 35,000 were employed in this branch. The seats of these manufactures are in the three midland shires, already named, and in the west of England.

The Woollen manufacture is seated in the West Riding of Yorkshire, and in the west of England; Leeds, Halifax, Bradford, Rochdale, and Huddersfield, are its chief towns. Norwich for crapes, Kidderminster for carpets. The wool is got from home or abroad, through London or Hull, and the goods are shipped from London, Liverpool, or Hull.

In 1845, the import of wool was 76,813,855 lbs. Of this wool much is from Germany; but the quantity from our own settlements yearly becomes more. In 1847, the imports from Australia were 26,056,815 lbs.; from the Cape, 3,477,392 lbs.; and from the East Indies, 3,063,142 lbs., being more than half of the wool brought in that year, which was 62,592,598 lbs. The export of foreign wool in 1847 was 4,809,725 lbs.; and of English wool, 5,550,690 lbs., mostly to Belgium and France.—Little wool is sent abroad from Scotland, Wales, or Ireland.

The worth of woollens exported was, in 1847, £6,896,038 [United States, £2,277,732.] In 1815, it was £9,381,426; and in 1818, £8,140,767; and in 1849, £8,000,000. There has been a great increase in woollen or worsted stuffs, from 593,308 pieces, in 1815, to 2,492,217, in 1844; and of woollens mixed with cotton, from 926,264 yards, in 1815, to 32,612,854, in 1847. There has been a great falling off in baizes, flannels, kerseymeres, cloths, and duffels.

The export of woollen yarns, in 1847, was 10,065,231 lbs. [Germany and Holland, 6,959,720.] 1849, 12,000,000.

The import of Alpaca and Llama wool is increasing; in 1849 it was 600 tons; likewise of Mohair, or Goat's wool, which in 1844 was 1,290,771 lbs.

In 1839, the number of woollen mills in England was 1076, besides 161 in Wales; and of worsted mills, 418. The persons employed in woollen mills in England was 47,040; and in worsted mills, 61,632.

In 1841, the number of persons enumerated in the wool and worsted manufactures was 121,249, besides 35,000 unenumerated. This manufacture is important, because it employs so large a number of males above 20 years of age—no less than 86,000.

Railroad Law.

Interesting Railroad Case.—We copy from the Greenfield Gazette and Courier the following notice of a Justice trial, in which were involved the rights of Railroad Companies, their Conductors acting under their regulations, and of the passengers in their cars:—

George Burroughs, a Conductor on the Connecticut River Railroad, was arrested and examined before David Aiken, Esq., on Saturday, for assault and battery in putting Charles Day, of this town,

out of the cars, a few days since, just north of this town. It appeared that Mr. Day purchased a ticket for himself and lady from Greenfield to Vernon, and a few minutes after leaving the Greenfield depot, the Conductor, Mr. Burroughs, came to him and asked him if he had a ticket, and also to see it; and then demanded it. Mr. Day supposed Mr. Burroughs was not the conductor, and refused to give up the ticket. After asking Mr. Day for it three or four times, and Mr. Day as many times refusing, Mr. Burroughs stopped the train and put Mr. Day off, but not, as Mr. Day testified, until he had offered him the ticket on finding that he was really the conductor. The Corporation for Mr. Burroughs, contended that Mr. Burroughs was only following out the Corporation, in regard to the collection of tickets, and that if Mr. Day refused when called for, Mr. Burroughs had a right to put him off the train.

Justice Aiken decided that the rules of the Company were wholesome ones, and that according to the evidence, Mr. Burroughs had committed no assault on Mr. Day by ejecting him from the cars. Mr. Burroughs was discharged.

Cast Iron.

A series of experiments were made by George Rennie, Esq., F.R.S., &c., on the changes of ordinary temperature, particularly on the rise of the arches on Southwark Bridge, having three rows of arches in length, containing about 5,560 tons of iron, from which it appears that the rise of an arch, whose span is 246 feet, and versed sine 23 feet 1 inch, is about one-fortieth of an inch for each degree of Fahrenheit, making 14 inch for a difference of 50°. In Mr. Rennie's opinion, there is no more danger to the stability of iron bridges from the effects of expansion and contraction than to those of stone, for the abutments being firmly fixed, the arches must necessarily rise or fall.

Earth's Early Inhabitants.

It is strange that, in a thin bed of fine clay, occurring between two masses of sandstone, we should thus have convincing but unexpected evidence preserved concerning some of the earth's inhabitants at this early period. The ripple mark, the worm track, the scratchings of a small crab on the sand, and even the impression of the raindrop, distinct as to indicate the direction of the wind at the time of the shower; these, and the footprints of the bird and the reptile, are all stereotyped, and offer an evidence which no argument can gainsay, no prejudice resist, concerning the natural history of a very ancient period of the earth's history. But the waves that made that ripple mark have long ceased to wash those shores; for ages has the surface then exposed been concealed under great thickness of strata; the worm and the crab have left no solid fragment to speak to their form or structure; the bird has left no bone that has yet been discovered; the fragments of the reptile are small, imperfect, and extremely rare. Still enough is known to determine the fact, and that fact is the more interesting and valuable from the very circumstances under which it is presented.—*Ansted's Picturesque Sketches of Creation.*

New Mining Machinery.

During the past fortnight several gentlemen from Cornwall, and others connected with the mining interests, have visited the factory of Messrs. Donkin & Co., engineers, to witness a series of experiments on a new pump, designed for raising water from mines or other deep levels, by direct action, without the intervention of either main rods, buckets, plungers or valves. The machine used on the occasion for showing the action of the pump was a 1-horse power Bishop's improved disc engine, which possesses the extraordinary character of being applied either as a steam engine to drive machinery, or being driven by other machinery, to form a pump; it consists of a short cylinder [in this case 8 in. diameter], placed longitudinally, in which a disc with a projecting arm vibrates with a rolling motion. It was actuated by a steam engine of similar form; but water, wind, or horse power would do equally as well to show the same result. On the disc being set in motion, an immediate vacuum is formed at the induction port, to which the wildbore or suction pipe is securely fixed; the water now rushes up, and fills the space between the cylinder

and disc, which continues until the disc is opposite the delivery port, when the contents of the cylinder is forced out of the delivery port up the column, at the same instant the vacuum is forming on the opposite side, and a fresh supply is following that which is being delivered; thus, the only suspension from continual action is the instant of time the disc occupies in passing the ports, which, in consequence of the rapidity of motion, does not cause the least intermission of the passing current. The column here used was a 2-inch pipe, about 40 feet high; the water was ejected in a solid continuous stream, with the greatest ease, at a velocity of 2½ feet per second, and very much to the admiration of every one present. A small wooden model in sections was then shown the visitors, whereby all its working parts were explained; it is extremely simple, and does not appear in any way subject to derangement. A large pump on this system is in daily use draining a marsh in Yorkshire, throwing a continuous stream of 10 tons of water per minute; and one on a scale sufficiently large to raise 400 gallons per minute from a mine in Cornwall, 100 fathoms deep, is in progress; the assumed estimate of its duty is 110,000,000, or 3½ lbs. of coal per horse power.—*Mining Journal*.

History of the First Steamship that ever Crossed the Atlantic.

The American steamship *Savannah*, built by Croker & Fickett, at Corlear's Hook, in this city, is universally conceded the honor of being the first steam-propelled vessel that ever crossed the Atlantic ocean. From the memory of one of those who formed her crew, (Mr. A. Thomas, then fireman,) and believed to be, with one exception, the only survivor, we are enabled to give a succinct narrative of her voyage. According to his understanding of the facts, she was built by a company of gentlemen, with a view of selling her to the Emperor of Russia. This company was organized through the agency of Capt. Moses Rogers, afterwards her commander. The *Savannah* was a vessel of 390 tons, ship-rigged, and was furnished with a horizontal engine. This was placed between decks—boilers in the lower hold.

The *Savannah* sailed from New York "in the second year of the Presidency of James Monroe," to use the words of our informant, or in the year 1819. She first went to Savannah. From Savannah, she proceeded direct to Liverpool, where she arrived after a passage of 18 days, during seven days of which she was under steam.

When about entering St. George's channel, off the city of Cork, she was descried by the commander of the British fleet, then lying at that city. Seeing a huge mass of smoke ascending from the vessel, enveloping her rigging, and overshadowing the sky, he naturally inferred that a vessel was on fire, and in distress. And with commendable promptitude despatched two cutters to her relief. After passing near her a few times, taking a full survey, and firing a few guns across her stern, the steamer was boarded. Finally, being perfectly satisfied that all was right, the cutters bore away.

The news of her approach having been telegraphed to Liverpool, as she drew near the city, with her sails furled and the American colors flying, the pier-heads were thronged by many thousand persons, who greeted her with the most enthusiastic cheers. Before she came to anchor, the decks was so crowded that it was with difficulty the men could move from one part to another, in the performance of their duty. She was afterwards visited by many persons of distinction, and departed for Elsinore, on her way to St. Petersburg. She next touched at Copenhagen, where she remained two weeks. During her stay, Mr. Hughes, the American Consul, went out in her on a pleasure excursion fourteen miles, accompanied by the king, and other noted personages. From Copenhagen she went to Constadt and St. Petersburg. Not being able to get over the bar at the latter place, she lay opposite the city, six miles distant. Here, too, she was visited by the American Consul, Mr. Campbell, and the Emperor.

Here, as at other places, she was an object of much wonderment. She, however, was not sold, as had been expected, and sailed for home, putting into Elrington, on the coast of Norway, on the passage. From the latter place, she was 23 days

in reaching Savannah. On account of the high price of fuel, she carried no steam on the return passage, and the wheels were taken off. A similar course was adopted during a portion of the time occupied by the passage out from the United States. As it was nearly or quite impossible to carry sufficient fuel for the voyage, during pleasant weather, the wheels were removed, and canvas substituted. On nearing Liverpool, the more effectually to "astonish the natives," the wheels were restored. At the completion of the voyage, the *Savannah* was purchased by Capt. Nathaniel Holdrege, divested of her steam apparatus, and used as a packet between Savannah and New York. She subsequently went ashore on Long Island, and broke up.

Although Capt. Rodgers was offered \$100,000 for her by the King of Sweden, to be paid in hemp and iron, delivered in New York, Philadelphia and Boston, the offer was not accepted—the cash being wanted. It is said that \$50,000 or \$60,000 was sunk in this transaction.

Captain Rodgers, the commander of the *Savannah*, died a few years ago on the Pee Dee River, North Carolina. He is believed to be the first man that ran a steamboat either to Philadelphia or Baltimore. The mate was named Stephen Rodgers, and now resides at New London, Ct.

Appos to this subject, we quote from an old file of papers, the following paragraph, which appeared at the time of the arrival of the British steamship *Sirius*, in 1838:—

"The practicability of the undertaking (navigating the ocean with steam) was, in fact, already proved by American skill; the question now to be settled is, its economy, and its superiority to the usual mode of navigating; and this, we admit, will be due to British enterprise."

Heavy Masses of Copper.

We have been passing our office for a week past immense masses of native copper, of such weight as to require two teams to a wagon; and we take from Mr. McKnight's Shipping Books the weight of a few masses from the Cliff and Minesota mines.

The following are from the Cliff:—4,470; 4,600; 4,096; 4,000; 4,286; 4,200; 4,300; whole weight, 29,852.

Every piece, it will be noticed, weighs two tons or more and many of them are cut from masses weighing many tons.

The copper is too tenacious and compact to be broken in pieces by blasting and it has to be cut up with a long chisel, three-fourths of an inch in width, by chipping off piece after piece with a heavy hammer. By this slow and expensive process these large masses of native copper are cut up into pieces for shipment. An inventor of some machine for sawing or cutting this copper by steam power, would strike a vein of good fortune.

The Minesota mine is turning out masses of the same description and of the same great weights.

Here are four pieces lately sent down:—4,736; 4,050; 3,400; 2,465; whole weight, 14,641.

The schooner *Spartan*, Capt. Fuller, cleared at this port on the 10th ult. with 56 masses of copper, which weighed 57 1674-2000 tons, of which 13 weighed under 700 lbs. And the docks here, and at the mines are filled full of masses of the same enormous size. And all these constantly increasing shipments of this metal have to be carted across the portage, and shipped again, after being lifted on and off from carts and handled over four times, attended with great expense and delay, and all for want of a canal three-fourths of a mile.—*Lake Superior Journal*.

Wabash Canal.

We have taken some pains to ascertain the progress now being made in the construction of the Evansville division of the Wabash and Erie Canal. We had the pleasure about the first of June, of announcing that an important division of forty-two miles, between Terre Haute and Point Commerce, had been completed and the water let into it. We have now a continuous canal—the whole line is in fine navigable order—from Toledo to Point Commerce, Indiana, a distance of three hundred and fifty two miles. Point Commerce is one hundred and ten miles from Evansville, on the Ohio river, the southern terminus of the Wabash and

Erie Canal—the longest canal in the United States. The southern division from Point Commerce to Evansville, a distance of one hundred and ten miles—is in rapid process of construction.

A division of 17 miles extending to Newbury will be opened by the 1st November next.

Another division of 23 1-2 miles extending to Maysville on the road leading from Louisville to Vincennes will be opened by the fall.

We learn from the Chief Engineer, Jesse L. Williams, Esq., now having charge of the work—finished as well as unfinished portions of the canal—that he intends to pass loaded boats through the whole line from Toledo to Evansville, within two years from this date.—*Toledo Repub.*

A Runaway Locomotive.

On New Year's day, 1850, a catastrophe, which it is fearful to contemplate, was averted by the aid of the telegraph. A collision had occurred to an empty train at Gravesend; and the driver having leaped from his engine, the latter started alone for London. Notice was immediately given by telegraph to London and other stations; and while the line was kept clear, an engine and other arrangements were prepared as a buttress to receive the runaway. The superintendent of the railway also started down the line on an engine, and on passing the runaway he reversed his engine and had it transferred at the next crossing to the up-line, so as to be in the rear of the fugitive; he then started in the chase, and on overtaking the other he ran into it at full speed, and the driver of the engine took possession of the fugitive, and all danger was at an end. Twelve stations were passed in safety; it passed Woolwich at fifteen miles an hour, it was within a couple of miles of London when it was arrested. Had its approach been unknown, the mere money value of the damage it would have caused might have equalled the cost of the whole line of telegraph.

Steamboat Disasters.

The committee appointed by the Cleveland meeting to report on the number of steamboat disasters on the Northern Lakes have reported the following as the result of their investigations, viz:

Lives lost by 79 explosions.....	111
" " 11 fires.....	804
" " 41 collisions.....	62

Total.....977

Nearly all of these disasters have occurred within the last ten years. All this the committee think has been caused by carelessness and recklessness, and they recommend the passage by Congress of stringent regulations in the structure and running of boats, and the appointment of competent inspectors with adequate salaries, to see these regulations enforced.

English Railways.

Railway Traffic.—The gross traffic receipts on railways in the united kingdom during the first 24 weeks of the present year amounted to £5,291,235, being at the rate of £979 per mile. At the corresponding period of 1849, the receipts amounted to £4,664,032, being at the rate of £1020 per mile; of 1848, to £4,136,837, being at the rate of £1127 per mile; of 1847, to £3,654,196, at the rate of £1273 per mile; and at the same period of 1846, to £3,172,950, being at the rate of £1477 per mile. The aggregate length of the railways open over which the traffic was carried at the end of the 24 weeks in 1850, was 5560 miles; in 1849, 4711 miles; in 1848, 3804 miles; in 1847, 3031 miles; and at the end of the period mentioned, in 1846, 2232 miles. The increase in the receipts during the 24 weeks in the present year over those of the corresponding period in 1849, amounted to £627,203; the increase in the receipts during the same period in 1849 over the preceding year was £527,195; in 1848 over 1847, £482,641; and in 1847 over 1846, £481,245. In the mileage, the increase at the end of the 24 weeks in 1850 over the corresponding period of 1849, was 849 miles; in 1849, 907 miles; in 1848 773 miles; and in 1847 the increase of mileage over the end of that period in 1846, was 799 miles. The diminution in the receipts per mile for the 24 weeks, as compared with those of the preceding year, amounted in 1850 to £41; in 1849 to £107; in 1848 to £146; and in 1847 to £304.

making the total diminution of receipts per mile during four years, £498, or about 34 per cent. It appears from the above that a considerable improvement has taken place in the traffic receipts per mile during the present year, which is attributed, in a great degree, to the comparative falling off in the mileage opened, which, for the present year, shows an increase over the preceding one of only 18 per cent., while in 1847 it amounted to 35.8 per cent. of the mileage open in the preceding year.

Survey of the Cleveland, Norwalk and Toledo Railroad, from Wellington to Toledo.

The party of surveyors engaged in surveying the route of the Cleveland, Norwalk and Toledo railroad, arrived in our city yesterday, having completed the survey from Wellington to this place. We have examined their profile, and it shows an extraordinarily favorable route. The maximum grade on the whole line is 20 feet per mile. There are but six curves (and they very short ones) in the entire distance. Three of these are between Wellington and Bellevue and the Sandusky river, and the last on this side of that river, about a mile from Fremont. From that point to Toledo, the road, as surveyed, will be a perfectly straight line, a distance of 28 to 29 miles.

The Cleveland, Columbus and Cincinnati road is completed to Wellington, a distance of thirty-five miles, and two passenger trains are running between that point and Cleveland daily. Commencing at Wellington, the surveyed line west passes near Brighton and Clarkfield, through Norwalk, Monroeville, Bellevue, Hamer's Corners and Fremont, to Toledo, making the entire distance 78 miles. The Charleient, Black river, Vermillion, East and West Huron, Sandusky and Portage, seven in number, are the principal streams to be crossed. They are all passed within the maximum grade, and most of them with less than that grade. On one portion of the line, including Bellevue, there is a distance of 16 miles where no masonry will be required, except small drain culverts, and very few of them will be necessary. There is excellent and easy drainage all the way.

The survey was made under the direction of F. T. Harbach, Esq., Chief Engineer, by Wm. H. Newton Esq., of this city, and has been prosecuted with a degree of energy which reflects the highest credit upon those gentlemen, and the party engaged in making it. The inhabitants along the line have exhibited the most lively interest in the road—rendering the party all the "aid and comfort," and every attention in their power, and the expenses of the survey have been cheerfully and promptly raised. Every indication has been manifested by the people on the line, of a deep interest on their part in the rapid completion of the road; and there can be no doubt that the several counties are prepared to raise their proportion of the funds necessary for that purpose.

Gold Discovered in the Copper Region.

The editor of the Lake Superior Journal states: We were shown yesterday, by Capt. John Halloran, of this place, a piece of quartz rock, from Lake Superior, containing several dollars worth of pure native gold. The gold shows itself in particles, disseminated through the quartz, the largest of which, as near as we could judge from the appearance, weighs more than a dollar. He states that a friend in the mining country had discovered rocks of this description, of which this is a surface specimen, as its appearance clearly shows it to be; that there was no reason, object, or chance for deception in regard to it. He brought it down in order to have it examined, and we saw it thoroughly tested in several ways, yesterday, and there is no question as to its being genuine gold.

It is not, however, the first discovery of gold on the lake; geologists have detected it in several instances; and the lamented Dr. Houghton was confident that gold would be found in considerable quantities; and it has been supposed, from minutes made by him, and from remarks on the subject, that he knew more about its location than any one else, and even much more than he had ever made known.

We have no disposition to start a golden humbug story here at the north-west—California will

monopolize everything in that line—and we believe our copper and iron mines will be of more permanent and lasting wealth to this section, and to the whole country, than even a rich gold mine on Lake Superior. Still, we shall now expect to see this gold bearing rock tested and analyzed, and the country explored more fully, with a view to further discoveries in this precious metal; and we hope the sanguine expectations of the fortunate discoverer of this gold mine will be fully realized.

New Hampshire Railroad Bonds.—The Legislature of New Hampshire, at its last session, passed the following act:—

Sec. 1. Be it enacted by the Senate and House of Representatives in General Court convened, as follows: No Railroad Company in this State shall be exonerated from the payment of any bond or obligation payable on time, or any part thereof, issued by its directors, in pursuance of authority heretofore given by its stockholders, at a legal meeting of said company, on account of any discount made to the purchaser in disposing of the same.

Sec. 2. This act shall be binding on any Railroad Company—and such only that shall accept the same by a unanimous vote, at a meeting of the stockholders duly called for the purpose.

Sec. 3. This act shall be in force on and after its passage.

Indiana.

From a recent report of the President of this Road, Charles Rose, Esq., to the Directors, we copy the following account of the condition and prospect of this work. He says:—

"The grading of the balance of the road between this place and Indianapolis, was put under contract on the 28th of June, at an average of about two and a half per cent. below the engineer's estimate, and 26½ per cent., payable in the stock of the company; so that the grading and masonry of the whole line, between these points, is now under contract or completed. Considerable more than half of the work is now done, and the balance is progressing rapidly towards completion. All the heavy work will be completed the coming fall; and the whole line will be ready for the superstructure next spring. And if the iron can be obtained, so as to have it brought up the river early next spring, I see nothing to prevent the completion of the road to Indianapolis by the 1st of December, 1850.

The entire loss of the wheat crop last summer has made it very difficult to obtain a further subscription to our stock, or even to collect all that has fallen due on former subscriptions; but as the present crop has never been surpassed, I trust we shall be more successful the present season, and be enabled to meet all our engagements promptly, and pay off the small temporary loan made last season. I have sold \$37,700 of the Company's six per cent. bonds, payable in five years from the 1st of January, 1850. With this exception, we are entirely out of debt, and have a balance in the treasury of \$9,211 67, as will be more fully be seen by the Treasurer's report. And should the stockholders meet their payments promptly, and our stock subscription be increased, (as we have every reason to anticipate,) we shall have no difficulty in meeting all our engagements, without resorting to a further loan, until the road is ready for the iron.

The citizens of Illinois, seeing the progress we are making, begin to feel a deep interest in the extension of the road west to the Mississippi. A large amount of stock has been subscribed, and a company will be fully organized, under the general law of the State, the last of this month, with the intention of making a road from the State line opposite this place to St. Louis. Another company has a stock subscription of upwards of \$170,000, intending to make a road from this point to Alton, and expect to locate it in a short time. I understand the citizens of Springfield have it in contemplation to organize a company for the purpose of extending their western road to this place, so as to form a direct line from Quincy, by Springfield, and commencing here with the great Central or Atlantic and Mississippi road.

When we look at the grand project of uniting the East with the great and growing West, by this

central road to the Mississippi, and see the incalculable benefit it must be to the whole country, and the profitable investment it must prove to the stockholders, we ought to redouble our exertions to complete this part of the line as soon as possible, so that we may be able to step forward and aid our friends in the early extension of the lines connected with us.

Rhode Island.

Providence and Worcester Railroad Company.—The bonds of this company, which were issued three years ago, to procure funds for completing the road, matured yesterday, and were promptly met. The amount outstanding was \$424,000.—The funds raised to meet this payment were procured by a re-issue of the bonds of the company for \$400,000, equivalent to a renewal of a like amount of the old bonds. The residue of the amount, (\$24,000) was taken from the net earnings of the road on hand. The new bonds are payable as follows:—\$50,000 in one year; 50,000 in two years; \$300,000 in ten years; and bearing an interest of 6 per cent. per annum. They are all negotiated at par. It is the intention of the board, we learn, to pay off that portion of the bonds becoming due in 1851 and 1852, in amount \$100,000, by applying for that object a similar amount of the net earnings of the road during the years 1851 and 1852.—*Providence Journal*.

Georgia.

The business on the Western and Atlantic Railroad (Ga.) has increased very largely this year.—The passage receipts of last month were one hundred per cent. larger than last year, and the freight gains were very large. The aggregate receipts were \$12,541, against \$7,241 same month of last year. The receipts of the six months ending 30th June were:—

	1849.	1850.
Freight.....	\$48,680	\$66,119
Passengers.....	16,275	29,852
Total.....	\$64,955	\$95,971

Increase in 1850.....\$31,016

The receipts of the Central (Ga.) Railroad show likewise a large gain over July, 1849. The earnings are \$22,525 against \$33,160, an increase of \$10,634, or nearly 50 per cent.

Western and Atlantic Railroad.—The following table shows the earnings of this road for the past six months of the present year compared with the past:—

Months.	Freights.		Passengers.	
	1849.	1850.	1849.	1850.
Jan....	7,404 84	8,390 21	2,696 74	3,754 47
Feb....	7,833 53	9,133 93	2,472 98	4,336 14
March...	13,838 39	17,560 48	3,567 48	4,273 10
April....	9,892 14	14,546 66	2,559 22	5,245 20
May....	6,283 97	10,629 18	2,265 24	5,200 16
June....	4,427 56	5,897 38	2,714 28	6,644 08
	48,680 48	66,119 94	16,275 65	29,852 85

Forty-seven and a half per cent.; or a small fraction over forty-seven per cent. increase.

Central Railroad.—The profits of this Road for July over those of July, 1849, were \$10,634 93.

Illinois.

Alton and Terre Haute Railroad.—We understand that the Directors of the Alton and Sangamon railroad company met at Hillsboro on Tuesday last, and made choice of the following gentlemen as their officers, viz: Hon. Cyrus Edwards, of this county, President; John S. Hayward, Esq., of Hillsboro, Treasurer; Capt. O. Adams, of this city, Secretary. They likewise employed Wm. P. Crocker, Esq., to survey the route of the road, who expects to commence operations to day. This gentleman—who is well known for his excellent survey of the route of the Alton and Sangamon railroad, a few years since—has reconnoitered the route of the Alton and Terre Haute railroad as far as twenty-two miles east of Hillsboro, and expressed the opinion that it is entirely free from any serious obstacle, and even more eligible than the former route.—*Alton Telegraph*, 5th ult.

A DETAILED STATEMENT OF ALL THE CHARCOAL COLD BLAST FURNACES IN WESTERN PENNSYLVANIA IN 1850.

County.	Sold by Sheriff or failed, and date.	Furnace:		Name of works.	Situation, P.O.	Owners.	Kind of ore used.	Largest product.	Actual make 1849.	No. of persons employed.	No. horses, etc. employed.	No. of tuyeres.	Stack.		Kind of power used and No.	Kind of metal made and No.	Capacity.
		In blast.	Out of blast.										Feet high.	Feet bosh.			
Armstrong,	11 1849 S	1	1	1847 Rock,	Apollo,	A. Woodward,	H C	600	700	60	48	18	30	18	Steam	3	1100
		1	1	1846 Buffalo,	Worthington,	P. Graff & co.	C	300	300	40	20	28	32	28	S&W	3	1100
	1550 F	1	1	1842 Red Bank,	Red Bank,	Reynolds & Ritchie,	"	1900	1900	100	70	29	32	32	Steam	3	1900
		1	1	1847 Olney,	Kittanning,	McCre & Galbraith,	"	800	800	60	48	18	30	30	Water	3	1100
		1	1	1845 Mahoning,	"	J. A. Caldwell & co.	"	1300	1300	83	52	29			"	3	1400
		1	1	1830 Alleghany,	"	A. McNickle,	"	600	700	45	23	18			Steam	3	1100
	1845 F	1	1	1846 American,	"	Jamison & Ledlie,	"	700	700	57	38	28	6	6	"	3	1350
	1849 F	1	1	1845 Ore Hill,	"	W. & R. McCutcheon & co.	"	1610	1610	108	80	28			"	3	1610
	1849 S	1	1	1846 Phoenix,	Glade Run,	James E. Brown,	"	600	400	36	34	18			Water	3	1100
		1	1	1846 Pine Creek,	Kittanning,	G. B. McFarland,	"	1040	1040	75	50	18	30	30	"	3	1100
Butler,	6 1843 S	1	1	1846 Marion,	Harrisville,	Browns & Mosgrove,	"	1436	1436	65	50	28	4	32	Steam	3	1430
		1	1	1838 Slippery Rock,	Slippery Rock,	James Kerr,	"	700	700	40	28	18			Water	3	1100
		1	1	1840 Hickory,	"	J. McJunkin,	"	850	850	47	29	18			"	3	1100
		1	1	1843 Maple,	Maple Furnace,	Stewart & Sullivan,	"	650	650	50	26	18			"	3	1100
		1	1	1847 Kensington,	Lawrenceburg,	H. Graff,	"	1000	1000	80	60	19	31	31	Steam	3	1400
		1	1	1848 Winfield,	Butler,	A. W. Crawford & co.	"	900	600	80	50	29			"	3	1400
		1	1	1845 Mill Creek,	Johnstown,	W. L. Spear,	"	1400	1400	100	70	29	30	30	"	3	1400
		1	1	1842 Cambria,	"	J. Bell & co.	"	1050	840	90	38	18			Water	3	1100
		1	1	1846 Mount Vernon,	"	King & Schoenberger,	"	1300	820	90	45	28	30	30	Steam	3	1300
		1	1	1847 Ashland,	Summit,	Linon Galbraith & co.	"	1000	1000	90	45	18			"	3	1100
Cambria,	98 1845 F	1	1	1845 Helen,	Clarion,	Hugh McNeil,	"	800	800	40	18	30			Water	3	1100
		1	1	1838 Clarion,	"	W. S. Packer & co.	"	1500	1000	100	70	29	32	32	Steam	3	1500
		1	1	1845 Martha,	"	C. Meyers,	"	1400	600	70	45	19	32	32	Water	3	1400
		1	1	1844 Mary Ann,	Shippensburg,	J. Black & co.	"	1100	600	70	45	29	32	32	Steam	3	1400
		1	1	1832 Shippensburg,	"	Shipp & Black,	"	700	450	50	30	18	30	30	"	3	1100
		1	1	1844 Tippecanoe,	"	King & Maxwell,	"	1200	1200	70	50	18	6	6	"	3	1350
		1	1	1844 Prospect,	"	Alexander & McIlroy,	"	1000	800	65	46	18	32	32	S&W	3	1100
		1	1	1842 Elk,	Callensburg,	W. B. Feizer,	"	700	700	60	41	17	6	6	Water	3	1000
	1850 S	1	1	1844 St. Charles,	Shippensburg,	Patrick Kerr,	"	800	500	60	34	17	6	6	Water	3	1000
	1849 S	1	1	1844 Deer Creek,	Leatherwood,	James Hasson,	"	900	100	66	36	18	6	6	S&W	3	1400
Clarion,		1	1	1844 Black Fox,	Shippensburg,	Adams & Vernon,	"	950	950	66	40	18	6	6	Water	3	1100
		1	1	1841 Clinton,	Brady's Bend,	Moore & Seymour,	"	650	500	56	36	18			Steam	3	1350
		1	1	1845 Licking,	Clinton Furnace,	Sigworth & Feizer,	"	550	400	52	35	17	6	6	Water	3	1100
		1	1	1845 Monroe,	Licking,	C. Fulton,	"	900	700	72	38	18			"	3	1000
	1850 S	1	1	1845 Limestone,	Greenville,	J. & J. B. Lyons,	"	700	316	58	33	18			"	3	1100
		1	1	1838 Jefferson,	Jefferson Furnace,	S. F. Plummer,	"	1200	1200	83	58	29			W&S	3	1400
		1	1	1842 Buchanan,	Callensburg,	Plummer & Creary,	"	1200	830	85	61	29			Steam	3	1400
		1	1	1845 Pike,	Carlisle,	Lawson, Duff & Orr,	"	1000	830	77	53	18	6	6	"	3	1350
	1849 S	1	1	1846 Eagle,	Callensburg,	Reynolds & Cribbs,	"	850	850	58	47	18			"	3	1100
		1	1	1846 Catfish,	Brady's Bend,	Miller & Son,	"	1190	1120	75	48	19			"	3	1400
Erie,		1	1	1845 Sligo,	Clarion,	Lyons, Shorb & co.	"	1555	1215	75	40	18	6	6	"	3	1560
		1	1	1836 Madison,	Shippensburg,	Miller & Long,	"	1210	1050	92	73	19	35	35	S&W	3	1560
	1849 F	1	1	1835 Beaver,	Clarion,	Long, Carothers & Co.	"	1420	1420	105	84	29			Steam	3	1420
		1	1	1847 Mount Pleasant,	Stratonsville,	Brown, Phillips & co.	"	830	830	62	45	18	6	6	"	3	1350
	1849 S	1	1	1845 Hemlock,	Clinton,	Horner & Eaton,	"	986	986	69	43	18			S&W	3	1350
		1	1	1843 Franklin,	Reimersburg,	J. Thompson & co.	"	1025	912	67	50	18			Steam	3	1100
		1	1	1847 Richland,	Emington,	John Keating,	"	1000	1060	70	56	19			"	3	1400
		1	1	1842 Erie,	Erie,	Vincent, Himrod & co.	"	900	300	50	50	17	30	30	Water	3	900
	1847 F	1	1	1796 Fair Chance,	Unionsburg,	F. H. Oliphant & Son,	"	800	600	48	25	19	36	36	S&W	3	1400
	1849 F	1	1	1820 Cool Spring,*	"	McKean & others,	"	300	200	30	15	17	33	33	Water	3	900
Payette,	1849 F	1	1	1835 Wharton,	"	A. Stewart,	"	1000	400	60	42	18	33	33	S&W	3	1100
		1	1	1805 Spring Hill,	Spring Hill,	J. K. Duncan,	"	600	330	55	28	18	33	33	Water	3	1100
		1	1	1796 Union,	Connellsville,	S. Shoyer,	"	600	330	55	28	18	33	33	"	3	1100
	1849 S	1	1	1847 Buena Vista,	Armagh,	McClelland & co.	"	400		61	30	18	30	30	Water	3	1100

A DETAILED STATEMENT OF ALL THE CHARCOAL COLD BLAST FURNACES IN WESTERN PENNSYLVANIA.—(Continued.)

County	Sold by Sheriff, or failed, and date.	Furnaces		Name of Works.	Situation, P. O.	Owners.	Kind of ore used.	Largest product.	Actual make, 1849.	No. of persons employed.	No. horses, etc. employed.	No. of tuyeres.	Stack.		Kind of power used.	Kind of metal made and No.	Capacity.
		In blast.	Out of blast.										Feet bosh.	Feet high.			
Indiana,	1848 S		1847 Loop,	Smixburg,	Hampton & Smith,	C	Tons	200	50	25	99	38	38	38	Water	3	1400
	1		1844 Martha,	Newcastle,	Power & Sons,	"	600	200	75	30	28	36	36	36	"	1,2	1100
	3		1837 Springfield,	Leesburg,	P. Sennett & Co.	"	500	300	41	20	27	32	32	32	"	1,2	900
	1850 S		1845 Oregon,	Mercer,	Lyons Mix & Co.	"	300	300	50	25	28	637	637	637	Steam	3	1350
Somerset,	1849 S		1846 Iron City,	Johnstown,	W. W. Wallace,	"	600	600	75	40	28	634	634	634	Water	3	1350
	18		1847 Somerset,	Stoytown,	Huber & Myers,	"	900	300	80	50	18	630	630	630	"	3	1350
	1849 F		1844 Rock,	Franklin,	Kuster & Little,	"	300	300	43	15	16	21	21	21	"	3	700
	1850 S		1843 Bullion Run,	Phipps' Mills,	McKee & Harris,	"	760	250	58	38	18				"	3	1100
Venango,	1846 S		1830 Venango,	Hendersonville,	A. Phipps,	"	900	200	53	46	18				Steam	3	1100
			1847 President,	President Furnace,	Gen. C. Read,	"	509	509	50	25	18				Water	3	1100
			1835 Mill Creek,	Mill Creek,	E. E. Clapp & Co.	"	910	550	62	46	17	6	6	6	"	3	1000
			1832 Van Buren,	Franklin,	Charles Shippen,	"	920	700	57	50	17	6	6	6	"	3	1000
"	1850 S		1832 Clay,	"	James Eaton,	"	800	500	50	35	18				"	3	1100
	1850 S		1834 Slab,	"	Edmund Evans,	"	700	400	50	30	18	6	6	6	"	3	1350
	1848 S		1844 Victoria,	"	James Hughes,	"	700	200	46	33	18	6	6	6	"	3	1350
	1848 S		1844 North Bend,	"	Alexander Hays,	"	450	150	30	25	18	6	6	6	"	3	1350
"	1848 S		1844 Union,	"	Hoover & Rens,	"	600	150	42	31	18	6	6	6	"	3	1100
	1848 S		1844 Texas,	"	Guest, Williams & Co.	"	500	500	38	30	18	6	6	6	"	3	1350
	1847 S		1843 Liberty,	"	A. W. Porter,	"	900	200	60	50	18				Steam	3	1100
			1843 Reymilton,	Sugar Creek,	E. Reynolds & Co.	"	1000	450	60	60	18	30	30	30	Water	3	1100
"	1848 S		1839 Webster,†	Franklin,	Dempsey & Wick,	"	800	500	65	58	18	6	6	6	S&W	3	1350
			1836 Sandy,	Franklin,	Painter & Co.	"	653	653	53	32	18				Water	3	1100
			1838 Jane,	Clintonville,	W. Cross & Co.	"	785	480	57	38	18				"	3	1100
	1850 S		1835 Jackson,	Cass,	N. B. & D. P. Hatch,	"	730	310	60	36	18	6	6	6	"	3	1350
Westmoreland,			1815 Ross,	West Fairfield,	J. D. Mathiet & Co.	"	750	500	30	40	18				"	1,2	1100
	1849 S		1803 Washington,†	Laughintown,	J. Bell,	"	560	500	40	30	19	33	33	33	"	2,3	1400
	1848 S		1847 Ramsey,	Kiskiminitas,	Dr. Spear,	"	90	500	50	20	19	34	34	34	"	3	1400
			1846 Lockport,	Lockport,	W. McKierney,	"	400		50	25	19	33	33	33	"	3	1100
	34	49	35	84				72924	50968	5353	3520						104130

* Leased by F. H. Oliphant & Son. † Leased by S. Dempsey. ‡ Abandoned 1836; rebuilt 1848.

New York.

Ogdensburg Railroad.—The railroad was opened to Columbia Village on Wednesday, the 24th ult. The appearance of the cars was greeted at that place by a large concourse of people, who made the welkin ring with their shouts, as the iron horse came snorting in advance of the rattling train. Much credit is due to the directors and engineers on the road, for the vigor with which the work is pressed forward, and the skill with which it is constructed. On the 24th, a mile and a quarter of track was laid, the last 600 feet we are told was laid in fifteen minutes, and the directors confidently assert that they will have the track completed so as to run cars through the whole distance by the first day of October.—*Ogdensburg Sentinel*.

Buffalo and State-line Railroad.—The Fredonia Censor states that the whole line of the Buffalo and State-line is under contract—from Buffalo to La-grange, to Asa Wood & Co. of Buffalo; from the latter place to Fredonia, to Hays & Co. of Rochester; from this place to near the line of the town of Ripley, to Cook and McDonald, of St. Catharines, Canada, and from that point to the Pennsylvania, to Messrs. Leet & Ely. The contractors are to have the work ready for the superstructure by the 1st January next.

Virginia.

Manassas Gap Railroad.—The company was organized in Alexandria on the 30th ult. Alexandria was made the locality of the office for the first year. The following resolution was adopted:

Resolved, That the Manassas Gap railroad be located and constructed for some convenient point on the Alexandria and Gordonsville railroad, thro' the Thoroughfare Gap.

The officers are:

President—Edward C. Marshall.

Directors—J. W. Foster, Alfred Rector, C. H.

Hunton, Wm. H. Fowle, Wm. H. Irwin.

Chief Engineer—John McD. Goldsborough.

Clerk—Edward Green.

New Hampshire.

Ashuelot Railroad.—This road is nearly graded and ready for the rails. The bridges are so far advanced that the track layers can commence next week, and lay the rails without any delay, to the Connecticut river. The road will be open for travel in September.

Maine.

Androscoggin and Kennebec Railroad.—The report of the Directors of the Androscoggin and Kennebec Railroad have been published. The construction account, not yet quite complete, shows the cost of the road to Waterville, so far as now known, to have been \$1,621,878, or about \$30,000 per mile. The whole road was put in operation last December. For the six months ending with May, 1850, its expenses were \$29,925 26; and its receipts \$39,158 54. The largest monthly receipt was in March last, and the smallest in December. The Road has issued \$262,000 of preferred stock, on which holders are entitled to receive 5 per cent. semi-annually from the nett earnings of the Road after paying interest to the bond-holders, until the nett earnings shall be sufficient to pay an interest of six per cent. per annum on the stock, and on all the bonds issued for the first and second loans.—The first and second loans amount to \$300,000, and a third loan has been issued of \$100,000, payable in four years, at 6 per cent. interest. The existing liabilities of the Company are \$363,226 07, against \$135,031 79 of assets. To pay the interest on preferred stock and to bond-holders, and provide for the floating debt, are the first duties of the road; and hence it is obvious that "the stockholders must be content to forego any dividends for some two years to come."

AMERICAN RAILROAD JOURNAL.

Saturday, August 17, 1880.

Great Work on Bridge Building, etc., etc.

JUST published in medium folio, One Dollar, 75 cts. to subscribers.

Part I. of a "THEORETICAL AND PRACTICAL TREATISE ON THE CONSTRUCTION OF BRIDGES IN STONE, IRON AND WOOD," By George Duggan, Architect and Civil Engineer.

The present part contains beautifully executed plans, elevations, sections, and centering, of the Bridge of St. Maixence, France, by M. Perronet, the eminent Architect and Engineer, and plans, elevations, sections, and details of the oblique Timber Bridge, 700 ft. long, constructed for a double track across the River Tyne, on the line of the Newcastle and Carlisle railroad, by John Blackmore, C. E., with an introductory article on the relative merits of the various materials employed in the construction of Bridges, as regards economy, strength and durability, and critical remarks on the various forms of bridges designed and constructed by the most eminent architects and engineers in Europe and America.

"PART VI. of Specimens of the Stone, Iron and Wood Bridges, etc., etc., of the United States Railroads," By George Duggan, Architect and Civil Engineer, contains specimens of the plates and letter press intended for the APPENDIX, being the commencement of a complete Treatise on the Theory and Practice of Bridge Building. This will be one of the most valuable works on the subject ever presented to the attention of engineers in this country—condensing the most important information on this branch of architecture contained in the writings of the most eminent scientific men in the French, German, Italian, and English languages, in the course of the last and present century. It will be illustrated by numerous accurate representations of bridges of the greatest celebrity in modern times. Elaborate articles will be given on the strength, property, and uses of the different materials employed, and on the most approved methods of constructing Cofferdams, Foundations, Centering, etc., with descriptions and drawings of the various engines and Machines that were found most useful in constructing the works, and a selection of such specifications as may be of service to the practical bridge builder. The sixth number treats of the Application of Iron to Railroad Structures, and is illustrated by beautiful drawings of the Bridge across the Delaware at Saw Mill Rift on the Erie Railroad, and of the bridge over Fairfield street, on the Manchester and Birmingham Railroad. The great success of this work thus far is the best tribute to its scientific merit and its adaptation to the wants of the American engineer."—[New York Daily Tribune, June 28, 1880.]

Published by George Duggan, 300 Broadway, New York, to whom all communications should be addressed and subscriptions forwarded.

Parties remitting Mr. Duggan \$5. and the remainder \$4 when they have been supplied with the first six parts of the "Theoretical and Practical Treatise on Bridge Building, etc." shall receive it monthly as published. To those making Mr. Duggan a present remittance of \$9, the work will be forwarded post free to any part of the United States.

Massachusetts Railroads.

The stocks of the Massachusetts railroads, [with a few exceptions,] and those owned by the citizens of that State, in the roads of New Hampshire and Vermont, continue to fall, and it is apparently as difficult now as it was a year since, to foresee the point of their lowest depression. In the constant and regular depreciation of prices, all conjecture and opinion have been at fault. Those who have had the credit of possessing the most experience and knowledge in railroad matters, have been as wide of the mark as the merest novice in these affairs. The result has falsified all calculation, and people cease to speculate upon the future, and now quietly and patiently await its result.

The people of Massachusetts have expended about \$75,000,000 in railroads. Allowing that one-third only of this amount has been lost by depreciation of stock, here are 25,000,000 sunk by over-investment in railroads alone. This has been productive of great individual distress, and is exerting

a very injurious influence upon the business of that State, which does not participate in the present revival, which, after a long period of depression is now showing itself in many parts of the country, and which was anticipated in all. She has invested in unproductive property the means she formerly had to carry on her business, and it is to be feared that Boston in consequence will lose the relative position she has maintained with the leading Atlantic cities. What makes it still more unfortunate for her, is the fact, that commerce and manufactures, which, with the railroad interest, represent a greater part of the capital of Massachusetts, are at a low ebb, leaving her no means by which she can immediately recover her former prosperity.

That she will outgrow this state of things, we do not doubt. This result is as certain as the fact that she is superior to most other parts of the country in skill, industry, education and dogged perseverance. But she must first pay the penalty for some grievous mistakes, while other sections which have not committed them, by not pushing their enterprises to the same extent, and have their resources unimpaired, are profiting by her mistakes, and are pushing forward in their career, while she is recovering the ground she has lost.

One reason why these stocks have gone so low, is the abundance of them in market. They feel the same law of demand and supply to which merchandise is subject. Stocks are a drug now which would be sought after if they were secure. The buyer now has it all his own way. These stocks will gradually become absorbed, and they will then find their true value. This we believe above the present mark, in most cases. Some stocks, we think the Vermont Central for instance, will go much lower. We do not believe this to be worth \$20 per share. Here is a stock by which the Massachusetts people have been most egregiously humbugged. The efforts of a few men, whom accident gave some reputation in railroad matters, and who took this road under especial care, and by dint of puffing, and putting their reputation as railroad men into the case, and by claiming that this was a line superior in all respects to the Western, "the stock of which was once down to 40 cents on the dollar, and is now above par," enabled this stock to maintain for a long time a fictitious value in the market. How often have we seen these oracles come forward and assert that this stock was sure to pay, that it was one of the best in the market, and cautioning people not to dispose of it?—These men were for a long time credited, and under their advice people held on. The result is well known. It presents but an exaggerated history of many other roads.

In the construction of their railroads the Massachusetts people have proceeded upon the idea that any road between two points was sure to pay. So much for wisdom displayed in the selection of routes. Other matters equally important, such as the road was sure to pay, however managed, were assumed with equal facility. The proofs are to be found in the present condition of railroad property. The example of that State is becoming valuable in teaching, rather what should be avoided, than followed. It is negative rather than positive. It shows the danger of following self constituted oracles, and of pushing ahead too fast in great works where there are no lights in the past to guide.

With all their mistakes, we believe it may be truly said that the Massachusetts people have done

better than those of any other State would have done under similar circumstances. The results which we witness there was inevitable from the expenditure, without experience to direct, of such immense sums. It is the order of nature that truth can only be reached, by first exploding all error. An unsuccessful attempt may be valuable, in showing that it is not the right way. Massachusetts has done great service here; more than her share. If she does not complain, other people have no right to do so for her, who are now reaping the advantage of her superior enterprise and activity, in the lessons which her disasters are teaching.

Railroads vs. Politics.

The rapid progress that is now making in the physical sciences, including in this general term works of internal improvement and communication, and the attractions which they possess both for the educated and unlearned, are doing more to soften the asperities of political feeling and secure the quiet and continued union of the States, than all other influences combined. We are getting to be a very mercurial people, and politics thus far has been the theatre where our extra steam has been worked off. In religious matters we wisely allow every man to think for himself, and consequently enjoy uninterrupted calm, as far as religious sects or parties are concerned. These treat each other with the utmost decorum, and each has work enough to do in making converts out of those who, by habit, education birth or connection, are nominally attached to its particular sect. In the religious world everything is orderly, decorous, and quiet, the result of unrestrained exercise of opinion.

The arena of politics is the great theatre where our people are arrayed against each other. As is always the case in contests of any kind, personal feeling soon takes the place of the idea upon which parties first divided, and the contest becomes one for victory and not for principle. Such in the main is a true statement of the condition of things at Washington at the present time. This is aggravated by the class of men sent there, many of them men without education, more without those qualities which entitle them to esteem and respect; men who owe their place to superior cunning or party usage and machinery, who, conscious of being without merit to attract attention, challenge it by the extravagance of their speeches and conduct.—They become notorious that they may become known. A member of Congress fears that he shall never be heard of after his time of service is out. He therefore adopts the superlative, both in action and speech, as the only road left him to fame.—The ultra abolitionist of the north, and the ultra pro-slavery man of the south, both act upon the same principle. A change of local position would have been an entire change of principle and profession. The most rabid free soiler, if he had been planted in South Carolina, would, in giving himself up to the natural extravagance, and very like, to the vindictiveness of his nature, and to his love of notoriety, are outdone the most rampant slaveholder in Congress, while the latter if he had been brought up at the north, would have displayed the same extravagance in favor of what he would call freedom, as he now does in favor of slavery. Extremes meet. The principles of such men are mere matters of accident, and take their character from their associations. The objects which call them into action are merely the occasion not cause of their display. We pity the Negro, who should ever become under change of cir-

circumstances, the slave of some philanthropists we know.

These men, the extremes of parties, who are false because they are extravagant, would destroy the union if they had the power. Our great danger lies here. So long as politics continue to be the path to distinction, so long will it be crowded by such persons whose impudence and assurance will secure success in contests, from which men of real merit retire in disgust. To correct this great evil, other avenues to laudable ambition must be opened; the attention of our people must be employed by other pursuits which will withdraw them from political contests, and by substituting for these interests of a higher value, will lead them in the end to view political matters in their true light, and to find in other pursuits the theatre for the exercise of higher and nobler ambition, having for its object the good of all and not of a section—a good which can only be realized to the fullest extent by the continuance of our union, as our whole population are to be its recipients.

Such is the new field that railroads are opening before our citizens ambitious of distinction and fame. To the promotion of these works, many who have been most distinguished for political ability and success, in the south and west particularly, are now consecrating themselves. Here they find full scope for their activity, their enthusiasm, and their eloquence. Here success is measured by the amount of good done to others. In politics it must generally be purchased by the destruction of a rival. A man who by his own exertions secures the construction of a railroad, that would not have been built but for his efforts, is a benefactor of his race. In addition to the mere material good it accomplishes, in cheapening transportation, it becomes the most potent schoolmaster in the land. What a lesson does a locomotive teach! How poignantly does an uneducated farmer, who has never been beyond the smoke of his own chimney, feel his ignorance when he first sees this wonderful invention! He feels how little he knows compared with what others know. He feels how puerile have been all his ideas and objects compared with those of the great souls, the parents of these inventions. He at once repudiates his old teachers, and those ideas which have thus far constituted his life. He resolves thenceforward to call neither man nor tradition master; but to inquire and seek for himself. He is disenthralled from the bondage in which he has been held.—He will now believe only what he can see, and will hold his judgment in suspense till he can make a proper examination.

It is this freedom of opinion which is essential to the true liberty of the state. In passion mankind are all alike. In intellect they are infinitely varied. In this department of our nature no two men will agree. Each has his own theory adapted to his peculiar mental organization. One party refers the external appearance and formation of the earth to fire; another to the action of water. One says that all electricity is identical; another sees a manifestation of two kinds. No two will agree upon one point. This is practically illustrated in the great variety of religious sects before referred to, and the great freedom enjoyed is the true cause of order which prevails.

In all countries it is the action of the masses that is to be feared. Men act in masses in proportion as they are uneducated. They are subservient just in proportion as they are ignorant. A dema-

gogue may influence the passions of a whole community, and direct them at his will. This is why the priesthood of some countries exercise such an influence, and explains their opposition to education. The Pope knows that the locomotive would dethrone him in the end, and he will not allow them in his domains. He loses his power just in proportion as his people increase in knowledge. Despotism and education are the antipodes, the enemies of each other the world over. Every railroad therefore is the coadjutor of freedom. It educates the people. It develops a higher interest than politics. It generalizes our views. It attaches us equally to every part of our country. It destroys clanship. It detaches us from sectional and party cliques. It lessens the importance of political questions in our eyes. In fine, it takes away our old and gives us new ideas and pursuits which are identical in every part of our great domain.

Vermont and Canada Railroad.

Will some friend inform us who are "the company of rich capitalists" who have taken the stock of the Vermont and Canada railroad? It has been taken so often by said company that the public are desirous of knowing who constitute this formidable firm.

Michigan.

At the annual election in June, the following gentlemen were chosen directors of the Michigan Southern railroad company:

George Bliss, Springfield, Mass.; Charles Butler, John B. Jervis, Edwin C. Litchfield, New York city; Hugh White, Saratoga County; William L. Marcy, Albany; John Stryker, Rome; Elisha C. Litchfield, Detroit, Mich.; Charles Noble, Monroe, Mich.

This road is to be completed to Coldwater in September or October next. Beyond this point the road is under contract to Sturges, a distance of about 25 miles, to be completed, we believe, this fall. From Sturges, the distance to the Indiana State-line is about 25 miles. After reaching Indiana, the company propose to proceed under the charter of the Northern Indiana railroad company. This charter extends to Michigan city. Beyond this, we see it stated that the above company are acting under the western division of the Buffalo and Mississippi charter, is already at work and has twenty miles under contract, to be done by 1st December next.

The opening of the whole line to Chicago is a matter of great importance not only to the public, but to the roads which are to be connected with it.

Pennsylvania.

Ohio and Indiana Railroad.—Although we have already directed the attention of our readers to this new, and, to us, very interesting railroad project, yet its importance to this city calls for another, and more particular notice.

At the last session of the Legislature of Ohio, the Ohio and Indiana railroad company was chartered, to construct a railroad from the western terminus of the Ohio and Pennsylvania railroad, to Fort Wayne, in Indiana, a distance of about one hundred and forty-one miles. This road will form part of the great north western line, from Pittsburgh to Chicago. The company is organized, and Crawford county has subscribed one hundred thousand dollars to the stock. Another county on the line has voted to subscribe an equal amount.

Jesse R. Stranghan, Esq., has been chosen the Chief Engineer of the company, and he has already

located the road from Crestline to Bucyrus.—It is expected that sufficient means will shortly be provided to grade and bridge sixty miles of the line. The country is remarkably favorable for the construction of a good railroad, and the flourishing town of Fort Wayne is a most important point to reach.

Ohio.

Cleveland and Pittsburgh Railroad.—As each month rolls round, our surprise is greatly increased at the rapidity with which this work is progressing. The contractors, Messrs. Chamberlain & Co., are pushing every facility presented to complete the work, and there is not the least doubt but that the contracts will be filled within the time specified.—The several bridges in this vicinity, (which are heavy works) are progressing fast and will be completed at an early day. It is expected that the contractors will commence laying down the track at this point sometime during this month. The ties are mostly on the ground, and 73 tons of spike have already arrived. Two locomotives have been shipped from the Taunton works, Massachusetts, and will be here in a few days, to assist in putting on the superstructures. The June estimate just paid to the contractors amounts to \$46,383 63. In fact, but comparatively a few days more will pass before we shall hear the rumbling of the cars over the track of the Cleveland and Pittsburgh railroad, between Ravenna and Cleveland.—*Portage Whig.*

A Canal Propeller.

The Chicago Daily Advertiser says that a new species of canal craft made its appearance in that port on the 19th, named the "Chief Engineer of Illinois and Michigan Canal." It is built after the model of the largest sized canal boats—has an upper deck, and will accommodate 35 passengers, and is propelled by two engines, and her average speed in coming up the Illinois river was five miles per hour, having 100 tons of freight on board. The canal authorities, after a careful examination, gave it as their opinion that she caused less disturbance of the water than any packet or line boat. She is owned by Captain O. C. Lewis, of Chicago, and W. A. Dickerman & Co., of Liverpool, England.

Illinois.

Mississippi and Atlantic Railroad.—This company has recently been organized by the choice of the following gentlemen as officers:

President—Wm. S. Wait, of Bond.

Directors.

Justin Harian, of Clark.

W. B. Archer, "

J. V. Hedges, "

Lova Corey, "

J. Cutright, of Cumberland.

J. Ewart, "

J. F. Waschendorf, of Effingham.

P. Funkhouser, "

—Waterman, of Fayette.

R. Blackwell, "

Francis Gill, "

S. White, of Bond.

Benj. Johnson, "

W. McCain, of Madison.

S. H. Mudge, "

Curtis Blackman, "

Treasurer—E. Capps, of Fayette.

Secretary—H. P. H. Bromwell, of Clark.

Principal Engineer—W. H. Morrison.

The object of this company is to build a railroad from Terre Haute, Indiana, to the Mississippi river opposite St. Louis, Mo.

The amount of stock subscribed considerably exceed \$160,000. Ten per cent. on this amount has been paid in, and the other requisitions of the gen-

eral railway law complied with to project the organization and vest in the company all the valuable rights and privileges which the law confers.

Alabama.

Mobile and Girard Railroad.—This road is an interesting one to the people of Savannah, as it will be, through the Muscogee (Macon and Columbus) road, the great link to connect this port with Mobile and New Orleans. It derives interest to us from another cause too. It must effectually check the progress of our South Western railroad through Fort Gaines to Pensacola. It supplies the place of this extension, and reaches the Waters of the Gulf of Mexico at a point some sixty-five miles further west than a road would having its terminus on the east side of Pensacola harbor.

The eastern terminus is fixed at Girard, Ala., opposite Columbus, Ga.; that of the western will be at one point near the head of Mobile Bay.—The length of the road will be about 250 miles, varying with the western terminus, and will pass through the counties of Russell, Macon, Pike, Montgomery, Lowndes, Butler, Monroe, Conecuh, and Baldwin, moving generally upon a dry ridge, requiring few and short bridges and but little expense for drainage. Gradients will not exceed 42½ feet per mile. The change of course is effected by curves and radii not exceeding 1,910 feet. There will be several long tangents or straight lines upon the route, one probably of twenty miles in length in Baldwin county.

At Girard the elevation is 250 feet above tide water level. Within fifty miles of that place, at Chunnynuggee ridge in Macon county, the line reaches an attitude of six hundred feet. The elevation is maintained for 120 miles, and then gradually descends to the waters of Mobile Bay, following the ridge which divides the waters flowing into the Alabama and Tensas from those which have an outlet into the Gulf of Mexico near Pensacola. The line strikes Greenville, the county site of Butler county, and passes within thirty miles of Montgomery, about forty miles of Pensacola, and within twenty of Claiborne.

In addition to the above, we learn that nearly sufficient subscriptions have been obtained to complete the grading and superstructure of the whole line. A bill has passed the Senate, giving to the company the alternate sections of public lands through which the road runs. It is estimated that this will secure to the enterprise about \$1,200,000. Besides this, the President of the company has assurances that he will be able to get a cash subscription in New Orleans sufficient to iron the whole road.

New York.

Buffalo and Cohocton Valley Railroad.—The directors of this company met at Avon last week, with the design of effecting a permanent organization. The Buffalo directors were not present, owing to the fact that the notice of the meeting did not reach them in time, and it was thought advisable to organize only temporarily. This was done by electing Hon. John Magee, of this village, President, and E. Howell, Jr., Secretary. Subscription books have been prepared and are ready for distribution along the line. Let the people take hold of the matter, and the work will move on. We understand that the best feeling was manifested at the meeting, and all felt confident, with proper effort, of the success of the enterprise. The directors will probably meet again early next month to effect a permanent organization. In the meantime the work of getting subscriptions and releases of the right of way will proceed. A corps of engineers are now upon the line between Batavia and Buffa-

lo, making an accurate survey with reference to the permanent location of that portion of the road.—*Schenectady Co. Courier.*

Sale of Ogdensburgh Railroad Stock.

The sale of the remaining bonds of the Ogdensburgh railway company took place at New York on Thursday, and was effected on the following terms:

269,000 at.....	90	
40,000 at.....	90	5-100
40,000 at.....	90	10-100
25,000 at.....	90	30-100
38,000 at.....	90½	
42,000 at.....	90½	
10,000 at.....	90½	
25,000 at.....	91	
6,000 at.....	91½	
4,000 at.....	92	
1,000 at.....	93	

500,000

These were the accepted bids out of a total amt. of \$746,000 offered. The bids were on New York and Boston account, chiefly for the latter, with a portion on northern account.

The bonds of this company amount to \$1,500,000, \$750,000 of which have been taken by individual stockholders, at par; \$250,000 were paid for railway iron, cars, etc., also at par; and the balance has been disposed of as stated above.

The company are now placed in funds to pay off the entire floating debt, and to complete the road with ease and despatch. The road is in use at the present moment for a distance of forty-five miles, but the entire length from Rouse's Point to Ogdensburgh will be completed and in running order by the first of October next. This road promises to be a very remunerating one, from the amount of freight that will offer. For the distance now finished all the force of the company is fully and constantly in use for freight.

Great American Engineering

AND MECHANICAL WORK, just published in medium folio One Dollar, 75 cts. to Subscribers. Part VII of "Specimens of the Stone, Iron & Wood Bridges, Viaducts, Tunnels, Culverts, &c., &c., of the United States Railroads." By George Duggan, Architect and Civil Engineer.

The present part contains beautifully executed plans, elevations, sections and details of the elegant timber Bridge, (Burr's Patent,) 150 feet span, across Salmon River, Malone, on the line of the Northern-Ogdensburgh-railroad, and isometrical views of Bridges 30, 40, 60, 82 and 88 feet span on the line of the Utica and Syracuse railroad, with specifications, form of contract, &c., &c., for the Connecticut River railroad.

"It is a work that was a great desideratum, and must prove of great benefit to the engineering profession generally, and especially to the tyro in practical engineering and mechanical knowledge; in truth it strikes us, that it would require years of labor and patient toil on the part of a young engineer to prepare the drawings, and collect the information that will be embodied in this work, and can now be secured for the trifling sum of \$9"—*Scientific Amer.* March 16, 1850.

In connection with this subject (Iron Railroad Structures) we take occasion to call attention again to Mr. Duggan's valuable and expensive publication, exhibiting drawings, with full descriptions of the various stone, iron and wooden bridges, viaducts, tunnels, culverts, etc., of all the Railroads in the United States. Mr. Duggan is an accomplished Architect and Civil Engineer, who came from Ireland to this country to exercise his profession; and finding railroad construction here, in many respects, different from that he had been accustomed to in Europe, he applied himself to the study of our system; and the fruits of his researches and investigations embodied in this work, are well calculated to meet the exigencies of engineers, and to assist draughtsmen, bridge builders, mechanics and students.—*[N. Y. Journal of Commerce, Feb. 14, 1850.]*

Published by

GEORGE DUGGAN,
300 Broadway, New York.

To whom all communications should be addressed, and subscriptions forwarded.

MINING AGENCY.

Capt. O. H. Matthews,

Civil and Mining Engineer, F. G. S., London, etc.
HAVING completed his three years engagement on Lake Superior, is open to negotiate for another appointment as Mining Agent, or Superintendent of Mines. Also, to give his opinion and advice upon Mineral Lands, to Buyers and Sellers of Stock, or to be consulted on any section in this important branch of national industry.

The most implicit confidence may be relied on, and immediate attention given to all communications (pre paid). Address Capt. O. H. Matthews, Toronto, July 27th, 1850. 3m

Gloucester Iron Works, GLOUCESTER, NEW JERSEY,

NEARLY OPPOSITE PHILADELPHIA.

THE subscribers having made extensive alterations in their works, are now prepared to receive orders for all kinds of Stationary and Marine Engines, Boilers, Locomotives, Sugar Mills, and every description of Mill Work.

Also—Orders for Iron and Brass Castings executed with despatch.

Having secured the valuable services of Mr. David Matthews as Superintendent (who has been for five years foreman in the Iron Works of John Watchman, now the Vulcan Works, Baltimore, and for 12 years Superintendent of the Mohawk and Hudson and the Utica and Schenectady Railroads, New York,) they feel confident that all orders entrusted to them will be faithfully executed.

Having an extensive Wharf in front of their works, it will afford a safe harbor for all classes of steam vessels that may require repairs during the winter.

C. M. & J. C. SITER.

Gloucester, July 24, 1850. 1m.

Ray's Patent India Rubber Car Springs.

Savannah, Ga., May 22, 1850.

FOWLER M. RAY, Esq.,

Dear Sir: I have no hesitation in saying, after having used on our road your springs and Fuller's, that I consider yours decidedly the best in every particular, and in this opinion I am sustained by all our officers. Fuller's spring has a tendency to split, and also to chafe or abrade by the constant friction on the cast iron plates or disc: and in my opinion is not near so elastic as yours.

Your springs, which have been in use on our road for 12 or 15 months past, and in constant use under both passenger and freight cars, are to all appearances as elastic, sound and good, as when first put in use.

We are now building eighty-five new cars, of which for fifty-sets the springs have been ordered of you.

GEORGE A. ADAMS,

Master Carpenter,

Central Railroad and Banking Co. of Georgia.

Connecticut River Railroad Office, }
Northampton, May 4, 1850. }

R. CRANE, Esq.,

Dear Sir: It is now about two years since I first tried the experiment of using a set of Ray's India-rubber Springs upon one of our merchandise cars, and although the car has been in constant service since that time, I do not on examination find the slightest difference either in the thickness or elasticity of the material.

The same result has followed wherever we have applied them, either for wheel or draw springs on Engines, Tenders or Cars. At present we use no other; either in replacing old springs or building new cars—and I am perfectly satisfied that for economy, durability, safety, and ease of motion, that Ray's India-rubber is the best article for Springs which has been presented to the public.

Yours respectfully, J. HUNT,
Supt. Connecticut River Railroad.

EDWARD CRANE, Esq.,

Dear Sir: Having applied to cars of the Boston and Worcester Railroad Corporation, Ray's Vulcanized Rubber Springs (where they have been in use for some two years last past), I have had occasion to observe their operation, and am free to say in answer to your inquiries, that they retain their elasticity perfectly during all changes of atmospheric temperature: and are in my opinion a most valuable acquisition to Railroad Cars—are not liable to derangement, as is the case with steel springs; while at the same time it costs less to apply them. Respectfully yours,

D. N. PICKERING,

Supt. Motive Power, Boats & Wor. Railroad,
Boston, April 15th, 1850.

Faggotted Car and Engine Axles

FORGED by RANSTEAD, DEARBORN & Co., Boston, Mass.
These Axles enjoy the highest reputation for excellence, and are all warranted.

Ogden & Martin's ROSENDALE CEMENT.

WE are prepared to enter into arrangements for supplying our Cement for public works or other purposes. We warrant the cement equal in every respect to any manufactured in this country. It attains a great degree of hardness, sets immediately under water, and is a superior article for masonry coming in contact with water, or requiring great strength.

For sale in tight barrels, well papered, at their office by
OGDEN & MARTIN, 104 Wall st.
February 16, 1850.

The above cement is used in most of the fortifications building by government.

Railroad and Mathematical Instruments.

KUNS & BASELER, Mathematical Instrument makers, manufacture and keep for sale all kinds of mathematical instruments; also drawing instruments, scales and balances for the use of chemists, professional gentlemen, jewellers, etc., etc., of the most perfect description, at the lowest price, at 81 Nassau street, New York.

Ibbotson, Brothers & Co's CELEBRATED CAST STEEL

AND
Best Cast Steel Royal Improved Files, well known as better adapted for Engineers' and Machinists' purposes than any now in use in the United States.

Every description of Square, Octagon, Flat and Round Cast Steel, Sheet, Shovel and Railway Spring Steel, etc., and Steel to order for any purposes—manufactured at their works in Sheffield—and universally known by the old stamp "Globe."

HENRY J. IBBOTSON, Agent.,
218 Pearl st., New York.

Railroad Iron.

OF ANY PATTERN AND WEIGHT,
Of a Favorite Brand,
And deliverable in Bond, or Duty paid, at any Port of the U. S., contracted for on favorable terms, by
CHARLES ILLIUS,
20 Beaver St., New York.

Pig and other Iron also contracted for. Sole Agent for "Baxter's Machine and Burning Oil"—particularly adapted for "Railroads" and other Machinery—Preferred to Sperrin by the many now using it, and 25 per cent. cheaper.

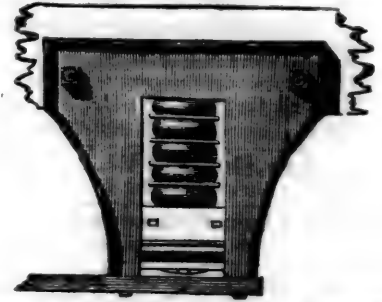
Coal.

CUMBERLAND SEMI-BITUMINOUS COAL
superior quality for Locomotives, for sale by
H. B. TEBBETTS,
No. 40 Wall St., New York.

May 12, 1849.

Im19

FULLER'S PATENT INDIA RUBBER SPRING.



THESE SPRINGS ARE THE CHEAPEST,
the lightest and most durable of any yet known. They are easily applied to new or old cars, and there is small possibility of any accident occurring to them.

Other parties through Mr. Ray set up claims to an India Rubber Spring which, though the same in principle, is very inferior in its working and durability. Actions are in progress for an Infringement on Fuller's Patent against parties using that Spring.

The superiority of Fuller's Spring over that claimed by Mr. Ray is fully established and has frequently been testified to. The following are from gentlemen who have had much experience with both Springs.

"It will afford me pleasure to recommend your springs to the companies in this region, in preference to Ray's which I am confident are inferior in mechanical arrangement to yours."
JOHN M'RAE,
Engineer S. Carolina R. R., Charleston.

"I do not hesitate to allow you to say that I concur in Mr. M'RAE's opinion that Ray's springs are inferior in mechanical arrangement to Fuller's. I repeatedly expressed that opinion long before Mr. M'RAE had seen your springs (as I believe) and entertain it still."
WM. PARKER,
Gen'l Supt. of Baltimore and Ohio R. R.

Office of Sup't Norwich & Worcester R.R. Co. }
December 26, 1849. }

"I most fully concur in the opinion of Jno. McRae, Engineer of S. Carolina Railroad, that 'Rays Springs are inferior to Fuller's Springs,' and shall with pleasure recommend them to all Railroad Companies for adoption. I have used both springs on this road and have no hesitation in saying that I should in all cases prefer Fuller's Spring."

SAM'L H. P. LEE, JR.,
Sup't and Engineer.

Office B. & P. R. R. Co. }
Boston, 20th December, 1849. }

"This company have cars fitted up with both Ray's and Fuller's 'Metallic India Rubber Springs,' and do not hesitate to say that Fuller's arrangement is very much superior to Ray's."

W. RAYMOND LEE, Supt.

The following result has been obtained by experiment upon one railroad.

A set of Trucks fitted
with Steel Springs cost \$190-77 and weigh 2355 lbs.
The same with Fuller's
Springs, 131-71 " 1911 lbs.

Difference, \$59-06 " 444 lbs.

Not only is there an advantage in the cost, but owing to the great reduction in weight, the car can be made lighter throughout, and so an enormous saving in weight may be effected in a Train.

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JOHN THORNLEY, 110 Chestnut St., Philad.
The **BOSTON BELTING CO., Milk st., Boston.**
January 2, 1850.

American Cast Steel.

THE ADIRONDAC STEEL MANUFACTURING CO. is now producing, from American iron, at their works at Jersey City, N.J., Cast Steel of extraordinary quality, and is prepared to supply orders for the same at prices below that of the imported article of like quality. Consumers will find it to their interest to give this a trial. Orders for all sizes of hammered cast steel, directed as above, will meet with prompt attention.

May 28, 1849.



To Merchants, Railroad Companies, Machinists and Boiler Makers.

THE subscribers beg leave to call attention to their very large stock of Iron and Steel—of American, English, Swede and Norway make—of all the different kinds in use. Also, Railroad Iron, Ship, Boat and Railroad Spikes. They are also Agents for the Best Pennsylvania Locomotive Boiler and Tank Iron, each sheet of which will be stamped and warranted, at lowest mill prices. Our prices for all kinds of iron will be found very low, either for cash or approved credit.

BRINK & DUBIN, Philadelphia.

CUT NAILS OF BEST QUALITY, BAR IRON
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BUFFALO, N. Y.BY.....**FISK & SPERRY,**
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DUNLAP'S HOTEL,On the European Plan,
NO. 135 FULTON STREET,
Between Broadway and Nassau St.,
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American Hotel,Pratt street, opposite the Railroad Depot,
BALTIMORE.HENRY M. SMITH.....Proprietor.
Late of the Exchange & St. Charles Hotels, Pittsburg.**Washington Hotel,**BY JOHN GILMAN,
\$1 Per Day.
No. 206 Pratt street, (near the Depot,)
BALTIMORE.**Barnum's City Hotel,**MONUMENT SQUARE, BALTIMORE.
This Extensive Establishment, erected expressly
for a Hotel, with every regard to comfort and conven-
ience, is situated in the centre and most fashionable
part of the city, and but a few minutes' walk from the
Railroad Depots and Steamboat Landings.
The House has lately undergone a thorough repair,
embracing many valuable improvements, and will ac-
commodate 250 Guests. BARNUM & CO.**JONES' HOTEL,**NO. 152 CHESTNUT STREET,
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[Ontanagon Postoffice, Lake Superior.**Cumberland Steam Coal,**FROM THE
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For the Purchase and Sale of Railroad Iron (new and
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John Barston, Esq., Providence.

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February 9, 1850.

6m*

**United States Railroad Guide
and Steamboat Journal.**CONTAINING OFFICIAL TIME ADVERTISEMENTS,
Tables of Stations, Distances, Fares, Time, etc.,
with much miscellaneous matter for the travelling pub-
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Published at 43 Ann street, New York.**STEEL AND FILES.****R. S. Stenton,**

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Manufacturers of Cast, Shear, German and Blister**STEEL**

Of all descriptions. Warranted Good

FILES.Manufacturers of Machinists' Warranted Best Cast
Steel Files, expressly for working upon Iron and Steel,
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NO. 51 EXCHANGE PLACE,
BALTIMORE.Agents for Avalon Railroad Iron and Nail Works.
Maryland Mining Company's Cumberland Coal 'CED'
—'Potomac' and other good brands of Pig Iron.**Cop Waste.**CLEAN COP WASTE, suitable for cleaning Rail-
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KENNEDY & GELSTON,

51 Pine St., New York.
October 27, 1849, 3m

Railroad Car Manufacturer's Furnishing Store.

F. S. & S. A. MARTINE,

IMPORTERS AND MANUFACTURERS OF

RAILROAD CAR & CARRIAGE LININGS,

PLUSHES, CURTAIN MATERIALS, ETC.,

113 WILLIAM ST., NEAR JOHN.

3-4 and 6-4 Damasks, Union and Worsteds; Moireens, Rattinetta, Cloths, Silk and Cotton Velvets, English Bunting.

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AGENTS for the sale of Charcoal and Anthracite Pig Iron, Hammered Railroad Car and Locomotive Axles, Force Pumps of the most approved construction for Railroad Water Stations and Hydraulic Rams, etc., etc.

July, 27, 1849.

James Herron, Civil Engineer,

OF THE UNITED STATES NAVY YARD,

PENSACOLA, FLORIDA.,

PATENTEE OF THE

HERRON RAILWAY TRACK.

Models of this Track, on the most improved plans, may be seen at the Engineer's office of the New York and Erie Railroad.

To Railroad Companies.

—WROUGHT IRON WHEELS—

SAFETY AND ECONOMY.

NORRIS' LOCOMOTIVE WORKS, SCHENECTADY, NEW YORK,

Are Manufacturing Wrought Iron Driving, Truck, Tender, and Car Wheels—made from the best American Iron. Address E. S. NORRIS.
May 16, 1849.

George O. Robertson, BROKER IN SCOTCH AND AMERICAN PIG IRON;

Bar Iron, Lead, Spelter, Tin, Copper, etc.,

No. 4 Liberty Place, MAIDEN LANE,

(Near Broadway.)

NEW YORK

Manufacture of Patent Wire ROPE AND CABLES,

For Inclined Planes, Suspension Bridges, Standing Rigging, Mines, Cranes, Derrick, Tilters, &c., by

JOHN A. ROEBLING, Civil Engineer,

TRENTON, N. J.

Doremus & Harris, ANALYTICAL & CONSULTING CHEMISTS,

179 BROADWAY, NEW YORK.

SCHOOL OF CHEMISTRY.

To Engineers and Surveyors.

E. BROWN AND SON Mathematical Instrument makers No. 27 Fulton Slip, New York, make and keep for sale, Theodolites, Levelling inst., Levelling rods, Surveyors Compasses, and Chains, Cases of Mathematical drawing insts. various qualities, together with a general assortment of Ivory Scales and small insts. generally used by Engineers.

Ranstead, Dearborn & Co.,

MANUFACTURERS OF

LOCOMOTIVE CRANKS AND CAR AXLES,

ALSO

WROUGHT IRON SHAFTING,

And All Kinds of Hammered Shapes.

Forge at Commercial Point, Dorchester,

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BOSTON.

Henry J. Ibbotson,

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I also, Agent for the Manufacture of Telegraph Wire.

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Cumberland, (Md.,) Coals for Steaming, etc.

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Samuel D. Willmott,
MERCHANT, AND MANUFACTURER OF
CAST STEEL WARRANTED SAWS,
—AND FILES—
IMPORTER OF THE
GENUINE WICKESRLY GRINDSTONES
NO. 8 LIBERTY STREET,
NEW YORK.

IRON.

Railroad Iron.

3,000 TONS C. L. MAKE 63½ lbs. per yard, now landing and to arrive.

Also contracts made for future delivery of above superior make English Iron.

300 Tons Banks Best Iron, Round, Square and Flat.

200 " English Bar " " " " "

10 " 9-16 Square Iron for Railroad Spikes.

For sale in lots to suit purchasers by

DAVID W. WETMORE.

New York, March 26, 1850. 3m

Railroad Iron.

THE Undersigned, Agents for Manufacturers, are prepared to contract to deliver Rails of superior quality, and of any size or pattern, to any ports of discharge in the United States.

COLLINS, VOSE & CO.,

74 South St.

New York, June 1, 1850.

Railroad Iron.

1,500 Tons weighing 53 lbs. per lineal yard.

500 " " 57 " " "

500 " " 56 " " "

500 " " 60 & 61 lbs. "

Also 2½ flat rails. All the above being of approved patterns. For sale by

DAVIS, BROOKS, & CO.,

68 Broad street.

N.B.—Rails imported on commission, or at a fixed price.

Iron.

Pig Iron, Anthracite and Charcoal; Boiler and Flue Iron, Spring and Blistered Steel, Nail Rods, Best Refined Bar Iron, Railroad Iron, Car Axles, Nails, Stove Castings, Cast Iron Pipes of all sizes, Railway Chairs of approved patterns for sale by

COLEMAN, KELTON & CAMPBELL,

109 N. Water St., Philadelphia.

IRONDALE PIG METAL, MANUFACTURED

and for sale by the Bloomsburg Railroad Iron Co.

LINDLEY FISHER, Treasurer.

75 N. Water St., Philadelphia.

Railroad Iron.

2000 Tons, weighing 53 pounds per lineal yard, of the most approved pattern of T rails, in store and to arrive, for sale by

COLLINS, VOSE & CO.

74 South St.

New York, June 1, 1850.

Railroad Iron.

1675 Tons, weighing about 61 lbs. per yard, 90 tons, weighing about 52 lbs. per yard, and 825 tons, weighing about 53½ lbs. per yard, of the latest and most approved patterns of T rail, for sale by

BOORMAN, JOHNSTON & CO.,

119 Greenwich street.

New York, Feb. 25, 1850.

N.B.—B. J. & Co are also prepared to take contracts for English rails, delivered in any of the Atlantic ports of the United States.

Railroad Iron.

THE UNDERSIGNED, HAVING made arrangements abroad, are prepared to contract for the delivery of Foreign rails, of approved brands upon the most favorable terms.

They will also make contracts for American rails, made at their Trenton works, from Andover Iron, in whole or in part, as may be agreed upon.

They are prepared to furnish Telegraph, Spring and Market Wire; Braziers and Wire Rods; Rivets and Merchant Bars to order, all made exclusively from Andover Iron. The attention of parties who require iron of the very best quality for special purposes, is respectfully invited.

COOPER & HEWITT,

17 Burling Slip, New York.

February 15, 1850.

Glendon Refined Iron.

Round Iron, Band Iron, Hoop Iron,
Square " Flat " Scroll "

Axles, Locomotive Tyres,
Manufactured at the Glendon Mills, East Boston, for
sale by GEORGE GARDNER & CO.,

5 Liberty Square, Boston, Mass.

Sept. 16, 1849. 3m37

PATENT HAMMERED RAILROAD, SHIP & BOAT SPIKES.—The Albany Iron Works have always on hand, of their own manufacture, a large assortment of Railroad, Ship and Boat Spikes from 2 to 12 inches in length, and of any form of head. From the excellence of the material always used in their manufacture, and their very general use for railroads and other purposes in this country, the manufacturers have no hesitation in warranting them fully equal to the best spikes in market, both as to quality and appearance. All orders addressed to the subscribers at the works will be promptly executed.

JOHN F. WINSLOW, Agent.

Albany Iron and Nail Works, Troy, N. Y.

The above Spikes may be had at face prices, at Erastus Corning & Co Albany, Merrill & Co., New York; E. Pratt & Br. Iler, Baltimore, Md.

LAP—WELDED WROUGHT IRON TUBES

FOR

TUBULAR BOILERS,

FROM ONE AND A QUARTER TO SEVEN INCHES IN DIAMETER.

THE ONLY Tubes of the same quality and manufacture as those so extensively used in England, Scotland, France and Germany, for Locomotive, Marine and other Steam Engine Boilers.

THOMAS PROSSER & SON, Patentees,

28 Platt street, New York.

Railroad Iron.

THE UNDERSIGNED ARE PREPARED TO contract for the delivery of English Railroad Iron of favorite brands, during the Spring. They also receive orders for the importation of Pig, Bar, Sheet, etc. Iron.

THOMAS B. SANDS & CO.,

73 New street,

New York.

February 3, 1849.

Iron Store.

THE Subscribers, having the selling agency of the following named Rolling Mills, viz: Norristown, Rough and Ready, Kensington, Triadelphia, Pottsgrove and Thorndale, can supply Railroad Companies, Merchants and others, at the wholesale mill prices for bars of all sizes, sheets cut to order as large as 58 in. diameter; Railroad Iron, domestic and foreign; Locomotive tire welded to given size; Chains and Spikes; Iron for shafting, locomotive and general machinery purposes; Cast, Shear, Blister and Spring Steel; Boiler rivets; Copper; Pig iron, etc., etc.

MORRIS, JONES & CO.,

Iron Merchants,

Schuylkill 7th and Market Sts., Philadelphia.

August 16, 1849. 1y33

Railroad Iron.

THE MOUNT SAVAGE IRON WORKS, Alleghany county, Maryland, having recently passed into the hands of new proprietors, are now prepared, with increased facilities, to execute orders for any of the various patterns of Railroad Iron. Communications addressed to either of the subscribers will have prompt attention. J. F. WINSLOW, President

Troy, N. Y.

ERASTUS CORNING, Albany

WARREN DELANO, Jr., N. Y.

JOHN M. FORBES, Boston.

ENOCH PRATT, Baltimore, Md.

November 6, 1848.

Railroad Iron.

THE SUBSCRIBERS ARE PREPARED TO take orders for Railroad Iron to be made at their Phoenix Iron Works, situated on the Schuylkill River, near this city, and at their Safe Harbor Iron Works, situated in Lancaster County, on the Susquehanna river; which two establishments are now turning out upwards of 1800 tons of finished rails per month.

Companies desirous of contracting will be promptly supplied with rails of any required pattern, and of the very best quality.

REEVES, BUCK & CO.

45 North Water St. Philadelphia,

March 16, 1849.

Monument Foundry.

A. & W. DENMEAD & SON,
Corner of North and Monument Sts.,—Baltimore,
HAVING THEIR
IRON FOUNDRY AND MACHINE SHOP
In complete operation, are prepared to execute
faithfully and promptly, orders for
Locomotive or Stationary Steam Engines,
Woolen, Cotton, Flour, Rice, Sugar Grist, or Saw
Mills,
Slide, Hand or Chuck Lathes,
Machinery for cutting all kinds of Gearing.
Hydraulic, Tobacco and other Presses,
Car and Locomotive patent Ring Wheels, war-
ranted,
Bridge and Mill Castings of every description,
Gas and Water Pipes of all sizes, warranted,
Railroad Wheels with best fagotted axle, fur-
nished and fitted up for use, complete
Being provided with Heavy Lathes for Bor-
ing and Turning Screws, Cylinders, etc., we can
furnish them of any pitch, length or pattern.
Old Machinery Renewed or Repaired—and
Estimates for Work in any part of the United States
furnished at short notice.
June 8, 1849.

Iron Wire.

REFINED IRON WIRE OF ALL KINDS,
Card, Reed, Cotton-flyer, Annealed, Broom,
Buckle, and Spring Wire. Also all kinds of Round,
Flat or Oval Wire, best adapted to various machine
purposes, annealed and tempered, straightened and
cut any length, manufactured and sold by
ICHABOD WASHBURN.
Worcester, Mass., May 25, 1849.

**Wheel, Forge and Foundry
Iron.**

LOCUST GROVE Wheel Iron of great strength
and superior chilling property.
Balt. Charcoal Forge Iron, from Patuxent, Curtis
Creek and Gunpowder furnaces.
Elkridge Foundry Iron, of superior strength and
softness. Anthracite and Charcoal Iron from Penn-
sylvania and Virginia. Gas and Water Pipes, Lamp
Posts from Elkridge furnace.
LEMMON & GLENN,
6m9 62 Buchanan's Wharf, Baltimore.

**S. S. Keyser & Co.,
IRON WAREHOUSE,**
Corner of South and Pratt Streets,
BALTIMORE, MD.

Selling Agents for the Rough and Ready Bar Iron
and Elk Boiler and Flue Iron Rolling Mills, Sarah
and Taylor Furnaces, and Wrightsville Hollow Ware
Foundry, and Dealers in Bar and Sheet Iron, and
Cast, Sheer, German, Blister, Spring and Electro-
steel, etc., etc.

Smith & Tyson,

GENERAL COMMISSION MERCHANTS,
No. 25 South Charles St., Baltimore, Md.

AGENTS for the Celebrated Columbia Pig Iron,
suitable for Car Wheels and Chilled Rolls.
Columbia refined Charcoal Blooms; Refined Char-
coal Junlatia Billet Iron for Wire; Refined Iron for
Bridging, of great strength; Cut Nails, Spikes, and
Brads; Railroad Spikes and Wrought Chairs. 22tf

Stickney & Beatty,

**DEALERS IN IRON AND IRON
MANUFACTURERS.**

AGENTS for the Balt. City Rolling Mill, from
which establishment they are prepared to furnish
Ellicott's round, square, and flat bar iron, puddled
and charcoal boiler plates and billet iron—also agents
for the sale of the Laurel and Maryland (Balt.) charcoal
forge pig iron, Balt. hard iron for chilling wheels, an-
ti-rust nails, Cast-iron foundry iron, boiler blooms
from the Caledonian works, Wm. Jessop & Son's cast
steel, Coleman's blister steel and nail rods, hoop, band,
sheet, oval and common English iron.
Nos. 18 and 20 South Charles st., Baltimore.

Railroad Iron.

CONTRACTS made by the subscribers, agents for
the manufacturers, for the delivery of Railway
Iron, at any port in the United States, at fixed prices,
and of quality tried and approved for many years, on
the oldest railways in this country.

RAYMOND & FULLERTON, 45 Cliff st.

Iron.

THE SUBSCRIBERS having resumed the agency
of the New-Jersey Iron Company, are prepared
to execute orders for the different kinds and sizes of
Iron usually made at the works of the company, and
offer for sale on advantageous terms.—

150 tons No. 1 Boonton Foundry Pig Iron.
100 " No. 2 do. do.
300 " Nos. 2 & 3 Forge do. do.
100 " No. 2 Glendon do. do.
140 " Nos. 2 & 3 Lehigh Crane do do.
100 " No. 1 Pompton Charcoal do.
100 " New-Jersey Blooms
50 " New-Jersey Fagotted Iron, for shafts
Best Bars, $\frac{1}{2}$ to 4 inch by $\frac{1}{2}$ to 1 inch thick.
Do do Rounds and Squares, $\frac{1}{2}$ to 3 inch.
Rounds and Squares, 3-16 to 1 inch.
Half Rounds, $\frac{1}{2}$ to 1 in. Ovals & Half Ovals $\frac{1}{2}$ to $\frac{1}{4}$ in.
Bands, $\frac{1}{2}$ to 4 inch. Hoops, $\frac{1}{2}$ to 2 inch.
Trunk Hoops, $\frac{1}{2}$ to $\frac{1}{4}$ in. Horse Shoe & Nut Iron.
Nail Plates. Railroad Spikes.

**DUDLEY B. FULLER & Co., 139 Greenwich-
st. and 85 Broad-st.**

**WILLIAM JESSOP & SONS'
CELEBRATED CAST-STEEL**

The subscribers have on hand, and are constantly re-
ceiving from their manufactory,

PARK WORKS, SHEFFIELD,

Double Refined Cast Steel—square, flat and octagon.
Best warranted Cast Steel—square, flat and octagon.
Best double and single Shear Steel—warranted.
Machinery Steel—round.
Best and 2d gy. Sheet Steel—for saws and other pur-
poses.

German Steel—flat and square, "W. I. & S." "Eagle"
and "Goat" stamps.
Genuine "Sykes," L. Blister Steel.
Best English Blister Steel, etc., etc., etc.

All of which are offered for sale on the most favora-
ble terms by **WM. JESSOP & SONS,**
91 John street, New York.

Also by their Agents—

Curtis & Hand, 47 Commerce street, Philadelphia.
Alex'r Fullerton & Co., 119 Milk street, Boston.
Stickney & Beatty, South Charles street, Baltimore.
May 6, 1849.

**JOHNSON, CAMMELL & Co's
Celebrated Cast Steel,**

**AND
ENGINEERING AND MACHINE FILES,**
which for quality and adaptation to mechanical uses,
have been proved superior to any in the United States.
Every description of square, octagon, flat and round
cast steel, sheet, shovel and railway spring steel, best
double and single shear steel, German steel, flat and
square, goat stamps, etc. Saw and file steel, and steel
to order for any purposes, manufactured at their Cy-
clops Steel Works Sheffield.

JOHNSON, CAMMELL & CO.,
100 William St., New York.

November 23 1849.

Railroad Iron.

THE Undersigned, Agents for Manufacturers, are
prepared to contract for the delivery of English,
Welsh and Scotch Rails, of any pattern and weight,
also for every description of English, Welsh, Scotch,
and Swedish Iron, Railway Chairs and Spikes, Riv-
ets, Bolts, Nuts, Washers, Chain Cables, Anchors,
Tin Plates, German Spelter, Iron Castings, and every
description of Machinery.

WILLIAM BIRD & CO.,
Iron and Tin Plate Merchants;
44 Wall st., New York.
And at 5 Martin's Lane, London,
and 140 Buchanan st., Glasgow.

July 27th, 1850.

**To the Proprietors of Rolling
Mills and Iron Works.**

**THE Undersigned—Proprietors of Townsend's Fur-
nace and Machine Shop, Albany—are extensive-
ly engaged in the manufacture of Machinery and fix-
tures for Iron, and Copper Rolling Mills, and Iron
Works. Having paid particular attention to the ma-
nufacture of *Rolls* (Rollers), both *chilled* and *dry-sand*,
they feel confident that they can execute orders for
such castings in a satisfactory manner. And to give
assurance of this, they beg leave to refer to the fol-
lowing named persons, proprietors and managers of some
of the most extensive rolling mills in the country, viz:
Jno. F. Winslow, J. Tuckerman, H. Burden, W. Burr,
J. & J. Rogers, Salsus & Co., J. B. Bailey, L. G. B.
Cannon, Hawkins & Atwater, etc., etc.**

F. & T. TOWNSEND.

Albany, August 18, 1849,

Railroad Iron.

B. O. Railway Tires, Railway Wheels,
Scotch Pig Iron, Tin Plates and Banca Tin,
Muntz Patent Metal Sheathing,
Baltimore Copper.

Contracts for Rails made on behalf of the manufac-
turers, for delivery at any ports in the United States,
at fixed prices.

Bowling Tires and Tire Bars and Scotch Pigs im-
ported to order.

Muntz's Ship-sheathing, and a general stock of Tin
Plates and Banca Tin in store, and for sale by
RAYMOND & FULLERTON, 45 Cliff st.

Bowling Iron. Stamped B.O.

Railway Tire Bars Rivet Iron
Locomotive and other Axles Locomotive Frame do
Boiler Plates Bars,
and every other description of this superior Iron.

The subscribers, agents for the sale of Bowling Iron,
are prepared to execute orders for importation, espe-
cially for railway and machinery uses, with despatch
from the manufacturers.

RAYMOND & FULLERTON, 45 Cliff st.

**Lovegrove's Patent Cast Iron
Water and Gas Pipes.**

THE Subscriber, the Inventor and Patentee of the
Centrifugal mode of giving form to metallic sub-
stances while in a molten state, is preparing to make
Cast Iron Water and Gas Pipes, of any dimensions,
at prices much lower than they can be made in the old
manner, and the pipes warranted to stand a pressure
of three hundred pounds to the square inch, and to be
soft enough to drill. Steam Engines and all kinds of
machinery. Cast Iron Doors and Frames, and Mill
Castings of every description, made to order.

THOMAS LOVEGROVE,
Machinist and Founder,
West Falls Avenue, below Pratt st., Baltimore.

Rosendale Cement.

**THE NEWARK AND ROSENDALE LIME
AND CEMENT CO.** are now manufacturing at
their works in NEWARK, N. J., and Ulster county,
N. Y., a very superior article of *Hydraulic Cement*—
also Lime Calcine Plaster, etc. Contractors and deal-
ers will find it to their advantage to call or make ap-
plication before purchasing elsewhere. All communi-
cations addressed to the subscriber, at Newark, N. J.,
will be punctually attended to.

ly*15 **HENRY WILDE, Secretary.**

Railroad Instruments.

**THEODOLITES, TRANSIT COMPASSES,
and Levels,** with Fraunhoffer's Munich Glasses,
Surveyor's Compasses, Chains, Drawing Instru-
ments, Barometers, etc., all of the best quality and
workmanship, for sale at unusually low prices, by
E. & G. W. BLUNT,

No. 179 Water St., cor. Burling Slip.
New York, May 19, 1849.

**American Railway Guide,
AND POCKET COMPANION FOR THE
UNITED STATES;**

CONTAINING Correct Tables, showing the time
for starting of trains from all stations, distances,
fares, etc., on all the Railway lines in the U. States;
also many of the principal Steamboat and Stage routes
—accompanied by a complete **RAILWAY MAP.** Price,
single copies 12 $\frac{1}{2}$ cts., or \$1 per annum. Published on
the first of every month, corrected from returns fur-
nished by the Railway Superintendents throughout
the Union.

This book has been compiled somewhat on the plan
of Bradshaw's Guide, with such improvements in size,
form and arrangement as have seemed desirable; and
the publisher confidently hopes it will not be found li-
able to the objections of incompleteness and incorrect-
ness, which have been made, and justly too, against
various other similar works heretofore issued.

The subscriber having had the management of the
NEW YORK PATHFINDER almost from its com-
mencement, has enjoyed superior facilities in obtain-
ing information relating to the thoroughfares of travel,
and is therefore well qualified to prosecute with suc-
cess the arduous undertaking of furnishing a complete
and correct national guide book.

STRINGER & TOWNSEND, General Agents,
222 Broadway; and sold also by Booksellers and Peri-
odical Dealers generally throughout the country; also
on all the Railways and Steamboats.

CURRAN DINSMORE, Publisher.

N. Y. Pathfinder Office,
138 Fulton St., New York City.

FARMERS! ATTENTION!!

John Mayher & Co's
NEW AGRICULTURAL WAREHOUSE
AND SEED STORE,

197 WATER STREET, NEW YORK.

Where they have for Sale, the largest and most complete assortment of Farming Implements, ever offered for sale in this city—all of which they will sell 10 per cent. Cheaper than the same kind of Goods can be bought at any other house in the city. Our Goods are all Warranted to give satisfaction.

FARMERS wanting to purchase, will please call and examine our Stock before buying elsewhere.

Among our assortment may be found the Celebrated Highest Premium Eagle Ploughs! together with all the most approved Ploughs now in use.

Also,—Horse Powers, Threshing Machines, Fan Mills, Corn Shellers, Straw Cutters, Corn Mills, Seed Sowers, Churns, Ox Yokes, Ox Scrapers, Hay Rakes, Horse Rakes, Patent Chain Pump (that never freezes nor rusts), and other Pumps; in fact we have everything for Farming Purposes—together with Guano, Bone Dust and other Fertilizers.

JOHN MAYHER & CO.,
197 Water st., N. Y.

February 9, 1850.

N.B.—J. M. & Co. also continue their Old Stand, at 195 Front street, near Fulton Market.

RAILROAD CAR AND COACH TRIMMINGS.

Doremus & Nixon,
IMPORTERS AND FURNISHERS

HAVE FOR SALE

Plain Garnet Plush. Fig. Garnet Plush (Butterfly pat.
"Crimson " "Crimson " (Elegant.
"Scarlet " " " (Gen. Taylor.

BROCADELLES.

Crimson Silk Brocadelles. Gold and Maroon do.
Gold and Blue " " Brown "
Silk and Wool " of every color.

MOQUETTES.

Of elegant designs and colors.

GERMAN CLOTH FOR CAR LININGS.

The most beautiful goods ever shown in this country, and the subscribers are the sole agents for the sale of them.

Oil cloths Enamelled with Gold. These goods can be
" " Silver. furnished in any
Do. Silver ground velvet printed. dimensions req'd.

CURLED HAIR

Of every description and quality.

JNO. W. A. STRICKLAND, Agent.
New York, 1850. 1y16

FOWLER M. RAY'S Patent India-rubber Railroad CAR SPRING.

New York and Erie Railroad Shops.
Piermont, March 25, 1850.

This will certify that from practical experience in the use of Fowler M. Ray's India rubber Car Springs, I believe them to be far superior to any others now in use.

I have never known them to be affected by any change of temperature, as other Rubber Springs have been affected on this road.

I am at the present time repairing a Passenger Car that Mr. Ray and myself mounted with his springs about two years and eight months since.

The springs are at the present time as perfect, to all appearances, as when first applied to the car.

Respectfully yours,

HORACE B. GARDNER,
Foreman of the Car Shops.

Supt. Office N.Y. & H. R.R.,
New York, March 8, 1850.

This is to certify that we have used the Rubber Springs manufactured by Mr. F. M. Ray for the past twenty months, "both for Passenger and Freight Car Springs and Bumpers, and of different sizes," and have in every case given entire satisfaction, and I consider them the best spring now in use.

M. SLOAT, Supt.

Boston, March 5, 1850.

In answer to your enquiry about India-rubber Springs, I have to say that we have used them to a considerable extent on both freight and passenger cars, and also on several of our tenders; and I am very well satisfied that they answer all the purposes for which they are intended. I believe the India-rubber will soon supersede all other springs for cars and tenders. Yours truly,

S. M. FELTON,
Supt. Fitchburg Railroad.

Office New Jersey Railroad Co.,
Jersey City, March 8, 1850.

FOWLER M. RAY, Esq.,

Dear Sir: In answer to your enquiries respecting the operation of the Vulcanised Rubber Springs, purchased by our company from you some two years since, I reply that they are superior to any spring in use, (that I have either seen or heard of).

The improved form of your spring, consisting of a solid piece of vulcanised rubber with bands on the outside, is far superior to your first form, consisting of disks of rubber with metallic plates interposed.

The last named form was tried, if you recollect, at a much earlier period; and then was replaced by your last form.

I have no hesitation in saying that your springs have given entire satisfaction, and most cheerfully recommend them to railroad companies throughout the country for the following reasons:

1st. The cost is 30 per cent. less.
2d. Saving of weight on each car of 8 wheels from 700 to 800 lbs.

3d. Less care and attention is required, as they are not liable to get out of repair.

4th. A great saving is secured in the wear and tear of the cars and rails from their great elasticity.

5th. The freedom from noise.

6th. There is greater safety in case of accident, as they cannot be broken.

7th. The comfort of passengers is enhanced sufficiently to pay the expense, waiving all the other reasons that I have given.

Should this fail to satisfy any person enquiring, you are at liberty to refer to me, No. 150 Washington St., Jersey City. Yours respectfully,

T. L. SMITH, Supt.

New York, March 11, 1850.

I have used the Patent India-rubber Spring purchased of Mr. Ray, upon the cars of the New York and New Haven Railroad, and have found them efficient and economical; and when applied to the axles and draw springs, believe them to be quite equal to any in use. I have found a combination of these springs with a steel spring under the transom beam a very satisfactory arrangement, and am now using this plan in all new cars.

Yours respectfully,

ROBERT SCHUYLER.

February 25, 1850.

From practical observation of the use of the India-rubber Car Springs, manufactured and sold by your company, we are entirely satisfied in their application, and do not hesitate to recommend them as elastic, durable, requiring no repairs for years, and retaining their consistency during all extremes of weather. We have applied them for the past two years, and consider them superior for all railroad purposes.

Yours truly,

OSGOOD BRADLEY, Car Builder, Worcester.
T. & C. WASON, do. Springfield.
DEAN, PACKARD & MILLS, do. do.
DAVENPORT & BRIDGES, do. Cambridgeport.

Office of the New Jersey Railroad Co.,
Jersey City, March 7, 1850.

This is to certify that we have had Mr. F. M. Ray's India-rubber Springs in constant use under our cars, and as Bumper Springs for upwards of two years, and they have in every way given perfect satisfaction.

The present form of spring we deem far superior to the form of Disk, having used both forms, although we have none of those made in Disks at present in use.

We take pleasure in recommending these springs to all railroad companies.

J. P. JACKSON, Vice Prest.
New Jersey Railroad and Trans. Co.

Roxbury, February 23, 1850.

In compliance with your request, I take great pleasure in stating the result of my experience in the use of "Ray's Patented Vulcanised India-rubber Car and Engine Springs." We have used them nearly two years, and never had one fail in any way. The cold weather does not affect them, as it has other rubber springs we have used.

With sixteen years' experience as superintendent of machinery on the Boston and Providence railroad, I take pleasure in saying that your springs are the best we ever used, or I ever saw used elsewhere. We have 20 cars rigged with them, of which I can say that the springs are as good now as when first applied. I put 24 lbs. of the rubber under the forward end of one of our heaviest engines, taking off 250 lbs. of steel springs—it has been in use 18 months, and is in as good condition now as when first put under the engine.

Very respectfully yours,

GEO. S. GRIGGS,
Supt. of Machinery, Boston and Prov. R.R.

Fall River, February 2, 1850.

In answer to yours of the 20th ult. I would say that this company has for some 10 or 12 months past been using "Ray's India-rubber Springs." We have applied them to both passenger and freight cars with uniform success. They have invariably preserved their elasticity and consistency through all the extremes of weather; and we are now applying them whenever the steel spring fails. I am well satisfied that they are particularly adapted for railroad purposes.

Very respectfully yours,

GEO. HAVEN,
Supt. Fall River Railroad.

Jersey City, March 9, 1850.

This is to certify that the present form of Mr. F. M. Ray's India-rubber Car Spring I consider far superior to the form of Disk, having used both forms.

I take pleasure in recommending these springs to all railroad companies. DAVID H. BAKER,
Foreman of Car Shop of N.J. R.R. & Trans. Co.

Harlem R.R. Depot,
New York, March 7, 1850.

This is to certify that we have used Mr. F. M. Ray's India-rubber Springs for over eighteen months, and find them to be easy and durable, and recommend them to railroad companies as being superior to anything we have tried.

J. M. SMART,

Foreman at 42d St. Depot.

Old Colony Railroad Office,
Boston, March 6, 1850.

EDWARD CRANE, Esq.,

President New England Car Co.,

Dear Sir: In compliance with your request I would state that the Old Colony Railroad Comp'y have had in use upon their road, India-rubber Springs furnished by your company, for more than eighteen months past, during which time they have been extensively used under Passenger and Freight Cars, Locomotive Tenders, and for Drawer and Buffing Springs, with the most perfect success. The elasticity and consistency of the Rubber has never been unfavorably affected by either extremes of heat or cold—and from the experience which we have had in the use of Rubber Springs, I think them well adapted for railroad purposes—and therefore we have for some months past used Rubber almost exclusively, in all places where springs are required.

Respectfully yours, etc.,

JAS. H. MOORE,
Supt. O. C. Road.

Troy, February 27, 1850.

We have been using your India-rubber Car Springs for nearly two years—and we take pleasure in saying that in our opinion the rubber has to a certain extent already, and may eventually entirely supersede all other Springs for Railroad Car purposes. We now use it entirely for Draw Springs and Bumpers, considering it better and lighter than steel.

During our two years' experience in the use of it, we have not known any to lose their elasticity, or fail in any way; and we cheerfully recommend the rubber for railroad car springs. Very respectfully,

EATON, GILBERT & CO.

Passenger Car Linings.

THE Advertiser continues to make to order the Enamelled Car Linings which have been so highly approved the last three years, and are now exclusively used by all the Northern Railroads. No pains are spared to get out new styles, and adapt them to the tastes of every consumer.

Orders addressed to CHARLES STODDER, No. 75 Kilby street, Boston, will have prompt attention. March 23, 1850. 2m

India-rubber for Railroad Cos.

RUBBER SPRINGS—Bearing and Buffer—Fowler's Patent—Hose from 1 to 12 inches diameter. Suction Hose. Steam Packing—from 1-16 to 2 in. thick. Rubber and Gutta Percha Bands. These articles are all warranted to give satisfaction, made under Tyler & Helm's patent, issued January, 1849.—No lead used in the composition. Will stand much higher heat than that called "Goodyear's," and is in all respects better than any in use. Proprietors of railroads do not be overcharged by pretenders.

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New York, May 21, 1849.

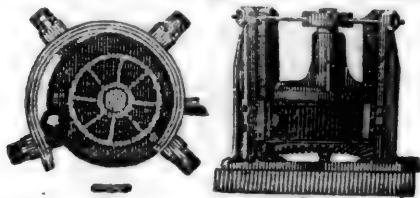
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March 6, 1850.

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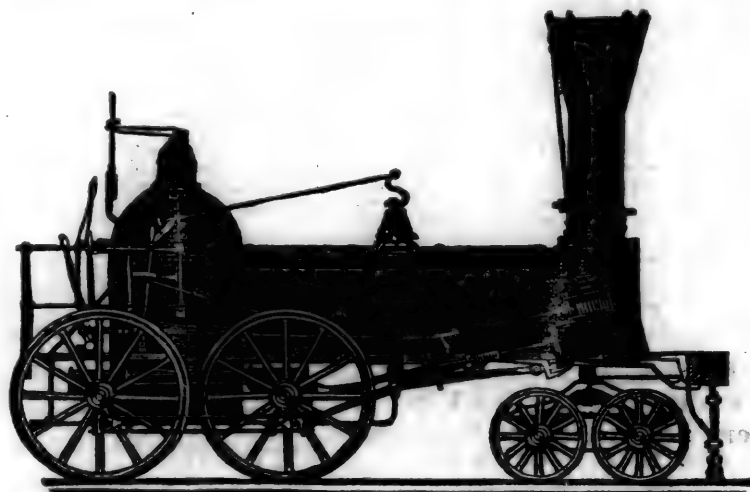
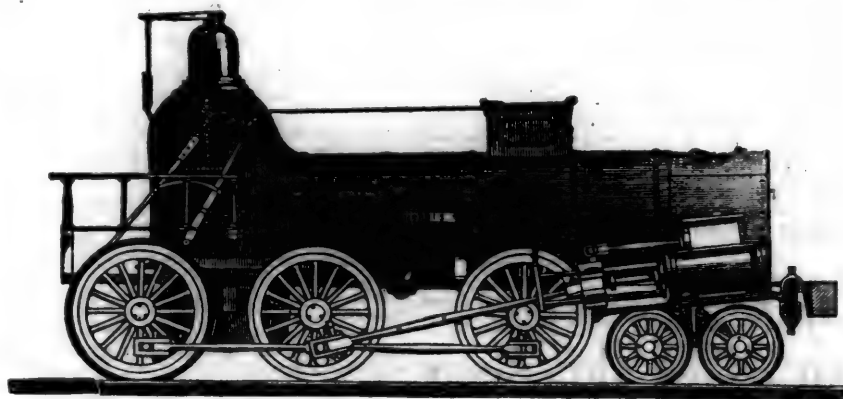
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November 3, 1849.

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AMERICAN RAILROAD JOURNAL.

STEAM NAVIGATION, COMMERCE, MINING, MANUFACTURES.

HENRY V. POOR, Editor.

ESTABLISHED 1831.

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American Railroad Journal.

PUBLISHED BY J. H. SCHULTZ & CO., 136 NASSAU ST.

Saturday, August 24, 1850.

American Iron Manufacture.

MEMORIAL.

To the Senate and House of Representatives of the United States of America, in Congress assembled:
Continued from page 515.

If this business has been overdone in Great Britain the evil consequences have fallen upon the manufacturers. The public has enjoyed an immense advantage in the abundance of a material so important in every department of industry as iron. The fluctuations in price which have ensued from this large production have been of late years so great as to cast in the shade all other commercial changes of price. The range of these fluctuations in pig iron during the last ten years is from £1 18s to £5 12s 6d, and in bar iron £4 10s to £13, or about 200 per cent.

In one extremity of this fluctuation, British iron becomes too high to import under a revenue duty; in the other too low to admit of home production.

In the one extreme we cannot afford to use it; in the other, it paralyses our efforts to manufacture for ourselves.

The legislation asked by American manufacturers deserves not the odium so frequently heaped upon it. We know that we can furnish to the consumers of this country a million of tons of iron cheaper and better than it can be had abroad. We ask for defence against those commercial fluctuations which occur in Great Britain, from causes wholly originating there, and which, while they thrust down the prices of iron there far below the cost of making, throw large and irregular quantities into our ports, disturbing the regular course of industry here; breaking down our markets and carrying ruin, at each such invasion, into many establishments. If we ask aid against such irregularities, it is no more than we should be obliged to do, if the manufacture in the United States, were as greatly developed as in Great Britain, and enjoying, in all respects, equal advantages. If that were the case, each of the equally powerful competitors, would seek to relieve their home markets in seasons of depressions, by thrusting the rejected surplus upon his rival; and each would seize the opportunity of high prices in the other to make large exports, until both markets, unable to maintain any high prices to compensate for unfavorable periods, would sink into hopeless depression, and the business perish or be greatly impaired. Against such consequences both would appeal to their respective governments for protection, not for monopoly; for that security against ruinous fluctuations, and that regularly in sales, indispensable to the success of industry. Competitors at home can observe their mutual progress, and take their measures of defence in time, but that competition which comes from abroad, cannot be watched, nor preparation made for its sudden inroads. If the British manufacturer is prevented from flooding our markets at less than the average upon which his business thrives, a mere revenue duty will be ample protection against the great advantages he enjoys, of employing labor at less than half the cost paid in the United States.

Among those most deeply interested in the vigor and prosperity of our iron manufactures are the farmers who furnish food, and the planters and manufacturers who furnish clothing, for our operatives in iron. We cannot here fully unfold the chain of mutual interests which binds all branches of industry together, nor exhibit its strength, and the importance of preserving it unbroken. We ask attention to only a few prominent facts. When the ports of Great Britain were opened to our agricultural products, it was fondly hoped that our farmers would find there an unlimited market for wheat and maize. At the present moment, however, these are very little higher in Liverpool than in Philadelphia, and the pressure of any increased export would sink prices there below ours. At the present rates of iron and flour in Liverpool, the

flour made from an acre of good wheat will about exchange for a ton of pig iron, and pay for its transportation to this country. If we take the product of the acre at four barrels, worth now in our market \$18 or \$20, it will exchange here for a ton of pig iron of far superior quality.

But farmers who feed the manufacturers of iron in the United States do much better than exchanging the product of an acre for a ton of pig iron.—A furnace yielding 4,000 tons of pig iron gives employment to two hundred laborers, each of whom consumes annually fifty dollars worth of food. Of this but one-tenth is expended for bread; the remainder is consumed in the shape of mutton, veal, pork, beef, poultry, potatoes, turnips, beets and other products of garden, field and orchard; the production of which in great variety is an accompaniment of all good husbandry and profitable farming. To import 4,000 tons of pig iron requires the product of 4,000 acres of wheat. But in our home markets the product of 500 acres will exchange for 4,000 tons of pig iron. An acre of potatoes, the cultivation of which does not exceed that of Indian corn, will exchange for eight tons of pig iron in the markets of Philadelphia. The farmer who, with 100 acres of wheat, prefers the foreign market, will receive for his crop 100 tons of pig iron, at present rates worth \$2,000, whilst he who has a hundred acres of potatoes can exchange his crop at home for 800 tons of iron, worth \$16,000.

Wheat sent to a distant market, which fluctuates according to the supply and demand, must be sold without reference to the cost of production, and without control of the producer for what it will bring in competition with all the world. What the farmer sells at home is at his own price, and is sold or held according to his discretion. Well cultivated lands dependant on a foreign market may be worth from \$5 to \$20 per acre; those that have the full advantage of a home market are worth from \$50 to \$200. If the production of iron in Pennsylvania were continued in full activity for ten years, it would double the value of her own lands and make a vast contribution to the value of other lands and property beyond her boundaries.

What is applicable to the propriety of sending wheat to a distant market to be exchanged for iron, is just as true applied to the expediency of sending raw cotton to England, to be exchanged for manufactured cotton, or any other foreign goods. The cotton plantations can feed the operatives necessary to manufacture all their cotton; and such a policy would triple the value of every cotton plantation in the country. To produce this additional quantity of food would probably require no more laborers than are now employed in growing cotton. It would only require that division of labor which is as important to the success of the planter and farmer as to that of any other producer.

To manufacture 800,000 tons of iron, the present product of the United States, gives support to upwards of 250,000 persons, to whom at least twenty

millions in wages must be paid. Of this sum \$4,000,000 will be expended in coarse cotton fabrics for clothing and furniture, \$3,000,000 for woollens, and \$3,000,000 for other items of clothing and domestic comfort. The \$20,000,000 earned by the operatives in iron will thus be diffused over the whole country, giving vigor and activity to numberless branches of industry. The South will furnish cotton, sugar and rice; the Middle States bread, potatoes and meat, and the Northern States the products of the loom; whilst thousands of tailors, hatters, shoemakers and other tradesmen, find constant employment in ministering to the necessities of the makers of iron, consuming themselves an additional quantity of food and clothing by a demand distributed in like manner.

It is said the domestic cost of manufacturing iron is too high to be sustained by any sound legislation, or to warrant any large consumption. We reply that our whole supply cannot be imported as cheaply as we manufacture it; for the reason, that the cost is not the only controlling element of price, and that our large demands, if made upon the British market, would quickly enhance prices far beyond the domestic rates. We must, therefore, manufacture at home at least three-fourths of our consumption; and, to do this, our manufactures must be maintained in full vigor by remunerating prices and a steady market. Iron costs twice as much to manufacture here as in Great Britain; because employers here pay double, for wages for labor. The laborers of the United States can be fully employed at the high wages which prevail here, and we are not prepared to say that these wages are more than a just compensation for labor. It is certain that in most countries where less rates are paid a large mass of the population is in a state of destitution, and sunk to the lowest grade of human existence. In this country, where physical well-being is so easily attainable, should we not feed, clothe and lodge our laborers in comfort, and keep them out of the poor house? The wages now paid are only sufficient for this, and to enable the prudent to make some savings for sickness, reverses and old age. We are not, therefore, in favor of any system which contemplates a reduction of wages, and a consequent degradation of our working men. We believe that the consumption of every country is regulated by the wages of the laborer: if he is liberally paid he will consume freely. The mass of the consumers in a country must be laborers; and, when these are able to exact a fair compensation for their toil, all prices must soon be adjusted upon the same scale. The manufacturer will demand for his product a price proportioned to the cost of labor; the farmer must do the same, and so on through the whole circle of industry. The laborer himself contributes to sustain these prices by a consumption proportioned to his income. All persons concerned in this adjustment being in a condition to ask and obtain justice, the whole system of consumption will be regulated by the rights of all and the means of all. In this state of things the largest possible consumption can take place; because it will be the result of a fair exchange. The stimulus to exertion and increased production will be complete, because every product of industry can be exchanged, at a fair rate, for other products. If no disturbing cause intervenes, the production and consumption need have no other limit than the physical ability of the producing parties and their mutual wants.

In full activity of business in the United States our consumption of iron has reached 100 lbs. for each person. If no disturbing cause had interfered, we should now be consuming 200 lbs. Our farmers could amply feed the laborers needful to such an increased production, and our machinists and mechanics could soon, under the operation of such a system, work up and prepare it for consumption. Every branch of industry would have all the rest for customers; and if all measured their values by the same scale, all would be rewarded according to their industry. It is well known that low prices of iron are no boon to those who buy to work up and sell, and that the seasons of highest prices are often periods of largest consumption. In 1847, pig iron ranged above 30 dollars per ton in this country, yet at these high prices the whole stock of that year, estimated at 750,000 tons, was consumed; and all the old stocks and remnants were swept off, and it was

perfectly apparent, to those well acquainted with the state of the market, that there was an actual deficiency of supply to the extent of very nearly, if not quite, 100,000 tons. In 1849, with pig iron at 20 dollars and bar iron at 50 dollars, the consumption of the country has probably fallen off one-third and the production one-half. With this diminished production domestic stocks are now accumulating rapidly. Of the amount imported this year a very large proportion yet remains in the market. The quantity of iron now on hand in this country is estimated at 300,000 tons; and of this one-half is British. The manufacturers of castings, of machinery and hardware, now find that the consumption of their articles is checked, and that the low price of their raw material is not only no benefit, but a positive evil, and they are ready, equally with the makers of iron, to ask for a remedy. A similar result will be found by comparing all the periods of high and low prices.

To be continued.

Nicaragua Route.

Below we give a portion of a letter from Mr. Squier, United States Charge d'Affairs to Central America, describing the River San Juan, which it has been proposed to make a part of a line of water communication across the Isthmus. It will be seen that Mr. Squier's opinion is entirely adverse to the practicability of this route for large vessels. If he is correct, and he gives us the result of his own experience, it puts an end to the magnificent expectations entertained in favor of this route.

The progress that is now making in our knowledge of the Isthmus shows how little has formerly been known of that region. A year since and we had the most glowing accounts of the entire feasibility of a railroad across the continent at Panama. A survey had been made, showing a good line and easy grades. Estimates of its cost, with all the minuteness usual at the commencement of a similar work, were presented to the public. A year has elapsed, and nothing or next to nothing has been accomplished. This is to be undoubtedly attributed to the difficulties of the undertaking, rather than to any want of means or disposition to push the work. We are yet in the infancy of our knowledge of that portion of the country, and caution dictates that our people should proceed slowly if they would safely in the opening of a canal or railroad through it.

The river San Juan, concerning which so much has been written, is certainly a magnificent stream. But its capabilities have been greatly exaggerated. It is the only outlet of the two lakes above mentioned, flowing from the southeastern extremity of Lake Nicaragua, nearly due east to the Atlantic. Its length has been variously estimated at from 79 to 104 miles. The first estimate is certainly too little. Mr. Bailly calculated it at 90 miles, and he is probably not far from correct. The body of water which flows through this stream is at all times considerable, but it varies greatly in amount with the seasons of the year. It is greatest during what is termed the "rainy season" in the interior, that is to say from May to November, at which period the body of water is nearly doubled. To this circumstance, in a great degree, may be ascribed the wide difference in the statements of the depth and capacity of the river made by different individuals.

The banks of the San Juan, from the Fort of San Carlos, at the outlet of the lake, to the *Rapides del Toro*, a distance of twenty miles, are generally low, and covered with palms, canes, and a species of high coarse grass, called *gamalote*. The river here sometimes overflows its shores; which, for a considerable distance back, seem to be flat and swampy. From the port of San Juan upwards, half way to the point of the divergence of the Colorado, a distance of eighteen miles, the banks of the river present a corresponding appearance. At the mouth of the San Carlos, there are hills two thousand feet high; and the river is much contracted. The entrance from the passage between them from the

west somewhat resembles the opening of the highlands of the Hudson from the north.

The banks of the river are in some places rocky, elsewhere they are far from being as crumbing as those of the Ohio and the Mississippi, and the other rivers of the western States of the Union. This is perhaps due, to some extent, to the roots of trees and plants which penetrate and bind the earth in all directions. The bed of the river may be regarded as essentially permanent. It, nevertheless, abounds in islands; of which there are hundreds. Some of them are low, and covered with *gamalote*, or with canes; but most are as high as the banks of the river, and wooded in like manner.

The width of the river varies from 100 to 400 yards, and its depth 6 to 20 feet. I should estimate the average volume of water at about that of the Hudson above tide water. The bottom seems generally to be gravel. There are four considerable rapids, where the bed is rocky and the water shallow. These will be noticed hereafter in detail.—The current, from the mouth of the river to the *Del Toro*, is strong. With the water at a medium stage, in a light bongo, and with a stout crew of ten men, I was six days in passing from San Juan to San Carlos. The men labored hard, at the oars and setting poles, from daylight until dark each day. We passed other bungeos which had left three days before us; and our trip was regarded as one of extraordinary rapidity for the season.—From these facts some idea may be formed of the strength of the current. Bulow calculates the fall of the stream at twenty inches per mile, except at the various rapids, where it is more.

The water of the lake opposite the fort, and fronting the opening of the San Juan, is comparatively shallow, not exceeding eight or ten feet in depth, with a mud bottom for the distance of a mile and upward from the shore.

The opening of the San Juan is probably three hundred yards and upwards broad, which width the stream maintains with great uniformity to the Rio Savalos, a distance of twenty miles. For this extent, the current is slight, according to Baron Bulow not exceeding *one and a half miles the hour*. The channel is wide, and the depth of the water from three to four fathoms. The banks are low, and the back country flat and swampy. Some sluggish streams come in from both north and south but they are almost hidden by the overhanging trees.

At the Rio Savalos commences the *Rapides del Toro*, which are about three fourths of a mile long. The water, of course, varies in depth with the different seasons of the year. At the time of my passage, it was certainly, for the most of its extent, less than a fathom. The banks upon both sides are firm and high, and the palm gives place to other and larger trees. Bulow gives the current at 180 to 200 yards per minute, but I esteem it something more.

From this point to the *Rapides Castillo* is six miles. The intervening banks are high, and the land well adapted for settlement. At the *Rapides* considerable ridges come down the river on both sides. The rapids here are short but swift, better deserving the name of falls than rapids. Barges cannot generally ascend loaded. When they have heavy cargoes, part of the same has to be removed and carried past the falls. The boats are then tracked or pushed up against the current by main force. My barge was upwards of two hours in getting as many hundred yards. These rapids, without artificial modification, would present an obstacle to all kinds of navigation. It might be made practicable with some trouble, for small steamers, light draughts, such as are used upon some of the small western rivers.

Three or four miles below the *Rapides del Castillo* are the *Rapides los Valos* and *Mico*, which may, however, be regarded as one; the current here is 200 or 300 yards per minute, the bottom rough and rocky, and navigation in barges difficult. The water does not appear to be more than from four to six feet deep, for any considerable distance. The banks correspond with those above the castle.

To the *Rapids of the Machuca* (the present limit of the English claim) the last, longest and worst, the river is deep and free from obstructions.

"These rapids," says Bulow, who is disposed to represent the capabilities of the river in the most

favorable light, "are worst of all; the water is more broken from running over a rocky bed; stones and rocks project above the surface for a distance of 600 yards, and great attention is necessary in passing the channel."

From this point to the San Carlos, the river is very fine, the banks high and studded with beautiful trees; the current is regular, but the depth of water variable. Bulow states the depth at from two to six fathoms. The San Carlos is a large stream, and may be ascended by bungoes to the distance of 15 or 20 miles.

From the River San Carlos to the Serapiqui, the banks are good, though not so elevated as they are higher up the stream; the current is strong but even, and the depth from 10 to 20 feet in the channel.

To the divergence of the Colorado river is a distance of 13 miles, the banks preserving their elevation to the divergence of the Juanillo, from which point they become very low; the current is regular, and the depth, according to Bulow, from 10 to 30 feet. The Colorado withdraws a large body of water from the river, which, however, continues to preserve nearly its original width to the port of San Juan. The channel for the remaining distance is studded with low islands covered generally with gamalote; the depth is very variable, ranging from four or five to ten or twelve feet, the bottom gravelly. In the dry season, bungoes pass with their loads with difficulty.

I have no hesitation in asserting that the San Juan can never be made navigable for ships of any considerable size. Small steamers, with some slight improvement in the channel, might be run without much difficulty, and this is all that can be hoped for from this stream.

In case it should be determined to open communications for ships across the continent at this point it would be necessary to cut a canal at the base of the hills parallel to the stream, which might be made to yield, at the necessary intervals, the requisite supply of water. It is probable that the river might be used, from the lake to Del Toro, though even this is not certain. I am convinced that the ground rises not very far back from the river on the north, and that stone and all the materials necessary for the construction of a canal might be obtained without much difficulty very nearly on the spot desired. These are things, however, that can only be determined from actual survey. A canal upon the southern bank, for reasons sufficiently obvious from what has been presented above, is impracticable.

Life of James Watt.

BY THE EDITOR OF THE MINING JOURNAL.

James Watt, the subject of our notice, was born at Greenock, in Scotland, in the year 1736, where he was educated at the grammar school, and at the age of sixteen apprenticed to a mathematical instrument maker, within two years after which he came to London, but subsequently returned to his native place. At the age of twenty-one we find him resident in the University of Glasgow, he having been appointed philosophical instrument maker to the College, where he remained for seven years, until the year 1764, when he established himself as an engineer, and was one of those consulted in the construction of the Caledonian Canal. It was about this period that his mind appears to have been more especially directed to the application and power of steam, arising from his having been engaged in repairing a model of a steam engine constructed on the principles of Savery, by Newcomen and Cawley, a patent for which had been taken out at so distant a period as 1705. The model belonged to the class of natural philosophy in the College, and Watt tried various experiments for its efficient repair. After having devoted nearly four years to these and subsequent investigations, we find that in 1768 he completed his first engine, which differed from that of the model by the condensation of the steam taking place in a second vessel, so that the descent as well as ascent of the piston was produced by the force of the steam, and not by atmospheric pressure, as in the engine of Newcomen. It was not, however, until 1769 that he secured his first patent, having been materially assisted, in a pecuniary point of view, by Dr. Roebuck in accomplishing his object, and effecting

those several improvements to which he was prompted in the course of his experiments. It being found that the steam, in coming in contact with cold water, caused a loss of two-thirds of the fuel by condensation, Watt introduced a wooden pipe or tube instead of iron, considering the wood as a worse conductor of heat. This, however, had not the desired effect, as the wood was found to present less resistance to the sudden changes of temperature. With a view of counteracting the obstacles which thus presented themselves, he determined on passing the steam through an iron tube without cooling the walls or outer surface, and which may indeed be said to constitute the invention of the condenser. A small air pump was also applied, which was worked by the piston, so as to get rid of the water in the condenser—this being Watt's first great improvement. His second was that of enclosing the metal tubes in wood, so as to retain the heat, and admitting the steam above and below the piston, as it required to be depressed or raised, calculating with a degree of nicety the fuel necessary for producing a certain quantum or power of steam, and the volume or quantity of cold water required to condense it. At this time, however, it is to be regretted that Watt possessed not sufficient means for extending the utility of his discoveries. About seven years afterwards, Dr. Roebuck, who had become reduced in circumstances, disposed of his interest to Mr. Matthew Boulton, of Birmingham.

Watt having thus become associated with Boulton, active steps were taken for the construction of a steam engine at their manufactory at Birmingham, which all connected with the mining interest were invited to visit, and which at the time excited much interest. Cornwall, which has made such great advances in the application of steam, and in the economy of working, whether as regards the saving of fuel or the greater power applied (and of which some comparative tables, with statistical details, will be found in our present volume), was the first duly to appreciate the advantages attendant on the improvements which had been so ably and successfully introduced.

We need hardly say, that as its advantages became more apparent, it gradually superseded the engine of Newcomen, which had been previously employed. The terms upon which the engine was supplied afford a good illustration of the superior mind and general liberality displayed by Watt and his partner. These were, that one-third only of the saving of fuel over that used by the old engine should be the price of the new one, thus at once demonstrating the confidence they entertained in the success of the latter, and which has been since that period so fully verified.

A very ingenious method was resorted to for ascertaining with precision the difference in the consumption of fuel, and as an instance of which it may be observed, that in one year alone, at the Chasewater mine, a saving of no less than £7,000 was effected in the space of twelve months in the working of three engines, which, assuming them to be of similar power, would be equal to the saving of fuel of one, or £2,333, which was the amount paid to the firm of Boulton and Watt as their proportion, being one-third of the advantages attendant on the saving.

This liberality did not, however, meet with a good return, for a combination was formed to resist payment of the dues, and which succeeded in invalidating Watt's patent. Nevertheless, Boulton and Watt succeeded in establishing a great business, and obtaining profitable results. On the whole it may be said there were advantages attendant upon the liberal policy observed by Watt and Boulton, but which is rarely followed in the present day. Too frequently have we found the expectations of the projector foiled, and the benefits which might attend the adoption of his invention or improvement completely marred, simply from the circumstance of exorbitant terms being required. Neither is it rare to find instances of want of liberality evinced on the part of those who have so much to expect from a connection formed with the capitalist, without whose aid it must in all probability lie dormant, unprofitable, and eventually be sacrificed.

An extension of Watt's patent was obtained in 1800, up to which period the engine had only been

employed to raise water; and having applied himself to the consideration of the best mode whereby it might be applied to the working of mills and other objects of a like nature, he invented that which is generally termed the sun and planet motion, whereby the object was attained.

If we name these as his chief works, it is not that his industry was limited to them. Indeed his inductions and discoveries embraced a wide field of knowledge which few men exceeded; and his share in discovering the composition of water gives him a place in the annals of natural philosophy, as his numerous other labors do in those of mechanical science. He was a student to the last days of a long life, and there was no branch of literature or science in which he was not proficient.

He was a Fellow of the Royal Societies of London and Edinburgh, and the Institute of Paris also elected him one of their eight foreign associates.—James Watt died on the 25th August, 1819, aged 84 years.

Few Englishmen have ever received greater testimonies of the esteem of their fellow countrymen, and few have so well deserved them for the lasting and practical nature of the services they have performed, and from which, in his case, our latest posterity will benefit. The chisel of the sculptor, and the pen of the writer, have both at home and abroad been applied to celebrate his services and record his fame, and there has been a generous emulation in the expression of public gratitude.

An *elogue* has been published by M. Arago, translations of which have been written by Mr. Muirhead and Mr. Hyde Clarke, and a paraphrase by Dr. Lardner. These give all the details of Watt's life and works.

An Essay on Pen and Pocket Cutlery.

Embracing a Detailed Description of the Mechanical, Chemical, and Manual Operations Performed on Certain Raw Materials, to Convert them into the Means, Implements, and Materials, for Manufacturing Pen and Pocket Knives.

BY A. L. HOLLEY.

Continued from page 514.

CHAPTER X.—HOW TO SELECT AND USE A POCKET KNIFE.

Having prescribed pen and pocket knives, and given a detailed account of the manner in which they and their materials are made, we next naturally look for some means of ascertaining what kinds and varieties are the best "stuff," and best adapted to certain purposes. Every one who purchases a pocket knife, if the assortment is large, can usually select just such an article, apparently, as he wishes. The farmers can find their stout jacks, and the ladies their more delicate pens—the horticulturist can obtain his budding, grafting and pruning knives, and the book keeper his pen and erasing blades; but no one knows certainly before a trial, whether his instrument will cut or not. It is the bounden duty of every one who carries a knife, to carry a good one, not only for his own sake, but for that of right and justice—for those who make and traffic in cast iron blades and pewter knives, should not and will not be patronized by a whittling and intelligent people. All that American cutlers wish, is, to convince the people that a good knife is better than a poor one. This is self-evident—but some persons are so blinded, as to really believe that it is better to agonize over and wear out a dozen soft and miserable blades, for which they have paid 12 cents apiece, and not finally accomplish their object, than to pay a dollar for a good knife, which will outlast the dozen, and do twelve times the execution. Hence, the Sheffielders take advantage of this defect of the Americans, and export great quantities of *trash* "which the more you whet, the more it will not grow sharp." These are the great stimulating blocks in the way of the farther progress of the science of 'Whittleol-

ogy," against which we wish to warn our readers. To those who use jack knives exclusively, the advice is given in three words, viz: *use American Cutlery*. No such trash, is made in America, as the best English steel is used in the cheapest and coarsest knives. There is no way of certainly ascertaining whether *jack* knives are good or not, except by feeling of the edge and using them, (though the former is often very uncertain,) without it is, to notice the manufactured stamp on the tang. It is usually much more easy to judge in regard to the merits of fine knives, by their general appearance and finish, though this is not always the case.—Before purchasing a fine knife, (without it is of American manufacture, in which case it is of course supposed to be perfect,) it is necessary to open the blades, feel of their edges, notice if they "walk and talk," (see chap. 7,) and keep the springs exactly even with the scales, when open or shut;—to hold up the instrument to the light, and form your inferences, if you can see through very distinctly between the springs and the scales; to look at the matching, and to notice if there are small creases (which indicates stiffness) running across the blade from the back to the edge, as a *fine* knife that is sold for a good article is usually well put together. Beware of double covering, or two pieces of yellowish pearl matched in the centre, on the same side of the knife, and of "slitted springs," or a half split spring, and no slip in a three blade knife, for these are unmistakable indications of *poor work* and *poor blades*. Some persons cherish the very erroneous idea, that blades are good if they dry quickly, when breathed on. Nothing is more absurd, for moisture will evaporate from the surface of highly polished silver or brass, as quickly as from steel, and even were this not the case, what effect could certain degrees of hardness in any body have on a superficial coating of moisture?—Many inexperienced whittlers, as soon as they have purchased a new knife, go and grind the polish entirely off from the blades, and often ruin their edge and shape, which barbarous process they term 'sharpening up.' It is not best to grind a *new* knife, but if it is dull, (as *new* American knives never are) a fine and substantial edge may be put on, by honing it, not by laying its face directly on the stone, but by slightly elevating the back, and moving the knife evenly across the hone. This will render the edge more obtuse and less liable to break, and quite as sharp, without removing the finish.—It is best to avoid *whittling* with *pen blades*, as much as possible, for if slender, and good, they will prove that they are of excellent material, by breaking. It is often necessary to oil the joints, or they will wear away, open hard, and at length, cease to be affected by the spring.

Ohio.

The Cleveland and Erie Railroad, from Cleveland to the Pennsylvania State-line, has been let to Harbach, Stone & Wilt, well-known contractors. It is to be a first class road in all respects, and is to be completed by the 1st of December, 1851, in season for the winter travel. If the other lines between Dunkirk and the Ohio State-line are finished as soon, New York will then be connected by railroad with Cincinnati. We fear that line from Erie to the Ohio State-line will not be in readiness by that time. The charter we understand is held by some of the Erie and Pennsylvania people, who are opposed to the road, and will not allow any proceedings under it.

A large number of the richest and most respect-

able citizens of Cincinnati have petitioned the Common Council of that city to loan the credit of the city for eight hundred thousand dollars to the Ohio and Mississippi railroad. The list is headed by Nicholas Longworth, the richest man in Cincinnati.

Commerce of Philadelphia.

Value of American Merchandise Exported from the port of Philadelphia to Foreign countries during the years ending June 30th, 1849 and 1850.

	Domestic.	Specie.	Total.
July 1 to Sept. 30, '48.	\$1,000,785	8,000	1,008,785
Oct. 1 to Dec. 31, '48.	1,445,636	200	1,445,836
Jan. 1 to Mar. 31, '49.	1,016,266	35,313	1,051,579
Apr. 1 to June 30, '49.	1,344,672	....	1,344,672
Yr. end. June 30, '49.	\$4,807,359	43,513	4,850,872
July 1 to Sept. 30, '49.	\$879,770	....	879,770
Oct. 1 to Dec. 31, '49.	1,094,732	70,000	1,164,732
Jan. 1 to Mar. 31, '50.	889,063	40,002	929,065
Apr. 1 to June 30, '50.	1,078,587	....	1,078,587

Yr. end. June 30, '50. \$3,942,152 110,002 4,052,154

	Domestic.	For.	Specie.
To June 30, 1847....	\$8,263,311	239,453	41,627
" " 1848....	5,428,009	251,653	52,671
" " 1849....	4,807,359	350,467	186,585
" " 1850....	3,942,152	297,889	260,671

Total 4 years.....\$23,440,831 1,139,462 541,564

Total Domestic, Foreign and Specie.

To June 30, 1847.....	\$8,544,391
" " 1848.....	5,732,333
" " 1849.....	5,344,421
" " 1850.....	4,500,712

Total.....\$24,121,857

Value of Foreign Merchandise Exported for the years ending June 30th, 1849 and 1850.

	Foreign Mdse.	Specie.	Total.
July 1 to Sept. 30, 1848.	\$55,705	\$40,112	\$95,817
Oct. 1 to Dec. 30, 1848.	49,961	21,651	71,612
Jan. 1 to Mar. 31, 1849.	113,529	74,614	188,143
Apr. 1 to June 30, 1849.	131,272	6,705	137,977

Totals.....\$350,467 \$143,082 \$493,549

July 1 to Sept. 30, 1849.	\$31,668	\$3,800	\$35,468
Oct. 1 to Dec. 31, 1849.	51,752	101,117	152,969
Jan. 1 to Mar. 31, 1850.	51,807	42,096	93,903
Apr. 1 to June 30, 1850.	163,563	3,656	166,218

Totals.....\$297,889 \$150,669 \$448,558

	Domestic.	Specie.	Total.
July 1 to Sept. 30, 1848.	\$3,781,170	\$3,781,170	\$7,562,340
Oct. 1 to Dec. 31, 1848.	1,988,898	1,988,898	3,977,796
Jan. 1 to Mar. 31, 1849.	2,832,673	2,832,673	5,665,346
Apr. 1 to June 30, 1849.	2,444,862	2,444,862	4,889,724
Yr. end. June 30, 1849.	\$10,644,803	\$10,644,803	\$21,289,606
July 1 to Sept. 30, 1849.	\$3,781,170	\$3,781,170	\$7,562,340
Oct. 1 to Dec. 31, 1849.	1,988,898	1,988,898	3,977,796
Jan. 1 to Mar. 31, 1850.	2,832,673	2,832,673	5,665,346
Apr. 1 to June 30, 1850.	2,444,862	2,444,862	4,889,724
Yr. end. June 30, 1850.	\$10,644,803	\$10,644,803	\$21,289,606

	Domestic.	Specie.	Total.
July 1 to Sept. 30, 1848.	\$3,111,788	\$3,111,788	\$6,223,576
Oct. 1 to Dec. 31, 1848.	1,717,517	1,717,517	3,435,034
Jan. 1 to Mar. 31, 1849.	2,552,524	2,552,524	5,105,048
Apr. 1 to June 30, 1849.	2,137,392	2,137,392	4,274,784
Yr. end. June 30, '49.	\$9,519,221	\$9,519,221	\$19,038,442
July 1 to Sept. 30, 1849.	\$3,104,982	\$3,104,982	\$6,209,964
Oct. 1 to Dec. 31, 1849.	1,339,722	1,339,722	2,679,444
Jan. 1 to Mar. 31, 1850.	3,511,672	3,511,672	7,023,344
Apr. 1 to June 30, 1850.	2,456,900	2,456,900	4,913,800
Yr. end. June 30, '50.	\$10,413,276	\$10,413,276	\$20,826,552
To June 30, 1847.	\$8,544,391	\$8,544,391	\$17,088,782
" " 1848.	5,732,333	5,732,333	11,464,666
" " 1849.	5,344,421	5,344,421	10,688,842
" " 1850.	4,500,712	4,500,712	9,001,424
Total 4 years.....	\$33,522,857	\$33,522,857	\$67,045,714

* Assumed.

The Governor of Mississippi, replying to a gentleman of Georgia relative to the continuous railway through Alabama and Mississippi to Vicksburg, states that the legislature, during its last session, passed an act reviving and amending the act to incorporate the Southern Railroad company, which "authorises the Governor, so soon as that company shall be organized, and shall have completed twenty miles of the road from its present terminus, (Brandon), to convey and surrender absolutely to such company the portion of the road now completed, and all the property of the State connected therewith, as well as all interest in the Two Per Cent Fund accrued and accruing, upon the company's guaranteeing the continuation of the railway to the Alabama line within six years." "The property of the State connected with the Southern railroad consists of about sixty able bodied and valuable slaves, horses, teams, wagons, carts, grading implements, and all necessary tools, &c., for 100 laborers; of a locomotive, passenger and freight cars, and balance of the Two Per Cent. Fund now on hand; the whole, including the cost of the section of the railway now completed, estimated at more than \$300,000 in value." The distance of the road to be completed, as ascertained by actual surveys, is but 98 miles, and the best calculations of the cost do not exceed \$12,000 per mile. A bill has passed the Senate of the United States, giving the State of Mississippi the right of way through the lands owned by the United States on the proposed line of their railroad, with 2000 feet of land, the length thereof, also the right to take necessary materials of earth, stone and timber from the public lands adjacent to said railroad for the construction thereof, and the United States grants for the purpose of aiding in the making the said railroad, every alternate section designed by even numbers for six sections in width on each side of said road. A convention of citizens of Georgia, Alabama and Mississippi, and others who may be interested in the great chain of railroads from Portland, Me., to Vicksburg, Miss. is to be held at Livingston, Ala., on the 1st of October next, and books for subscription to the stock of the road are to be opened on the 7th of October, at various points on the proposed route.

Nashville Suspension Bridge.

We have been politely furnished by the enterprising Architect, Capt. Fields, with dimensions of the superb structure now nearly completed across the Cumberland at this place, and which for beauty and workmanship, and substantial material, will compare favorably with anything of the kind we doubt not, in the United States.

Extreme length.....	672 feet.
Distance between the towers.....	538 feet.
Height on the Nashville side above low water.....	109 feet.
Height above the water at the last great rise.....	62 feet.

[Nashville Banner.]

Canada.

We learn with much pleasure that Mr. Campbell, whose abilities and enterprise as an engineer and railroad contractor are so well known and appreciated in the adjoining States, has concluded an arrangement with the Champlain and St. Lawrence railroad company for building the extension of their line to Rouse's Point, where it will connect with the several roads to Boston and New York, as well as with the Ogdensburg road, and that it will be positively opened for business, according to the terms of contract, in the month of June next.

Travellers will then be able to reach Boston in fourteen, New York in eighteen, and Prescott, in Canada West, in seven hours.—*Montreal Gazette*.

Railroads.—The Committee of the Hamilton City Council have recommended that body to issue debentures to the amount of £100,000 for the construction of the Great Western railroad.

A bill, authorising the issue of £100,000 in debentures, for the Toronto, Simcoe, and Lake Huron railroad, is now before the Toronto City Council.

We observe that there is a project afoot to con-

nect Plattsburgh with the projected Lake St. Louis line, and ultimately to continue that railroad to Whitehall.—*Hamilton Spectator*.

Steam Power of France.

According to a late statistical report, made to the government, the number of locomotive engines constructed in France, and employed by the country in 1842, equalled the number imported from abroad; in 1843 there were two more French than foreign engines; in 1844, the surplus was 44; in 1845, 76; and in 1846, beyond which year the report did not go, this excess was 161. In 1846, there were 294 steamboats, belonging to private individuals and companies navigating the rivers and seas. The numbers and force of the engines in use on land, and acting as locomotives in the steamers, were, in 1846, as follows, viz.: 4,395 engines at work on land, equalling 163,402 horse power; 461 locomotives, of 60 horse power each, upon the average amounting to 27,600 horse power; 338 engines used in steamships and boats, amounting to 208,513 horse power. These together give a force of 299,515 horse power. Comparing the strength of man to horse power, it will be found that the steam engines employed in France, in 1846, were substitutes for 2,097,625 men.

We see it stated that Mr Edwards, the Engineer of the Troy and Boston railroad, and Mr. Felton, the Superintendent of the Fitchburg road, have been sent to Europe by the Troy and Boston road to obtain information in regard to the new invention of the power drill by which it is stated 22 feet of solid rock may be got through per day.

We presume their mission has reference to the proposed tunnel on the line of the road between the Connecticut river and Troy. We find, notwithstanding the formidable character of this work, that a great many persons believe it to be practicable, and that there is strong probability that it will be commenced. It is to be three miles long, and to run 1500 feet below the top of the mountain. This great depth precludes the working by shafts, which can only be carried on at each end.

Massachusetts.

Manchester and Lawrence Railroad.—The report of the directors of this road shows the entire cost up to June 1st, 1850, to be \$749,424 06. The road was opened to public travel Nov. 13, 1849, but the freight trains did not commence until January 1st, 1850.

The gross amount of income to June 1st, is.....\$37,213 38
Whole amount of expenditure..... 24,104 19

Net earnings.....\$13,109 19
Estimated earnings, for June, 1850..... 3,500 00

3 per cent dividend on \$471,576 31, am.
of stock paid in.....\$14,147 29
Paid Boston and Maine road for the
use of same from State-line to Law-
rence..... 1,855 00

.....\$15,992 29
Leaving to go to depreciation account. \$615 90

Baltimore and Ohio Railroad.

The revenue of the Baltimore and Ohio railroad for July was as follows:

	Passengers.	Freight.
Main Stem.....	\$32,543 53	\$61,691 81
Washington Branch....	24,407 45	3,821 64
	\$56,950 98	\$64,513 45

Making an aggregate of \$94,235 35 on the Main Stem, and \$27,229 09 on the Washington Branch—the total being \$121,464 44. The above shows an increase over the corresponding month of last year of \$12,052 94 on the Main Stem, and \$9,346

45 on the Washington Branch—making an aggregate increase on both roads of \$21,399 39. Of the freight, 14,160 tons were coal.

Progress of the Railroad from Toledo to Chicago.

This road is making rapid progress westward.—We are permitted to state, on the authority of a gentleman connected with the board of directors, that the Great Western railroad will be completed from Toledo to Sturges Prairie, one hundred and sixteen miles, and the cars running over that distance this fall, and to Coldwater in all of September. Iron has been procured and is on the way here, for the whole distance. This will be welcome news to our citizens and to the whole west. Now, if the road between this and Fremont was completed we should secure the great bulk of the travel which usually passes the south shore of Lake Erie and Lake Michigan. We very much regret, that this road is not in readiness. That road should have been commenced this spring, and it could easily have been put in readiness. No time should now be lost in putting it under contract.—*Toledo Republican*.

Indiana.

Indianapolis and Bellefontaine Railroad.—At the annual meeting of the stockholders of this company, held at Anderson, Madison county, on the 3d instant, the following gentlemen were elected directors for the ensuing year, viz:

Jeremiah Smith, William M. Way and David Heaston of Randolph county, David Kilgore, S. P. Anthony and James Truitt of Delaware county, M. G. Walker, Allen Makepeace and Wm. Sparks of Madison county, Thomas R. Noel of Hamilton county, Oliver H. Smith and Alfred Harrison of Marion county, Wm. A. Rifner of Henry county, George King of Johnson county, and R. H. Winslow of New York.

The following persons were elected officers, viz: O. H. Smith, President; James G. Jordan, Secretary; Austin W. Morris, Treasurer; and Thos. A. Morris, Engineer.

In relation to the progress of the road the President in his report states that—"Within the year our stocks have been gradually increasing, and we have done much in procuring means and materials, and in the construction of the work; yet much remains to be done. Our liabilities of every kind have been promptly met, and our credit has been maintained unimpaired. We have purchased the heavy T rail, chairs, and spikes, for thirty-four miles of our road, extending from Indianapolis to Anderson, by the negotiation of our ten year bonds at fair rates. We are now ballasting the grade and laying the iron on the first general section from Indianapolis to Pendleton, twenty-six miles, at the rate of two miles per week, carrying forward the gravel, lumber and iron by steam power, and the balance of the iron to lay the eight miles, from Pendleton to Anderson, we expect to receive early the coming fall, and to lay it down before the season closes.

The Union steam track at Indianapolis has been completed and works finely. With this track the four railroads located to that city are connected by switches to their respective depots, and other roads, that may be hereafter located there, may connect in like manner, and the whole transportation from road to road will be done by steam, as the business shall require.

We have made arrangements by which the Madison company will do the business of our road with

their locomotives and cars, as far as Anderson, for a limited time, upon terms highly beneficial to both companies: we receiving the net profits of the road, and they receiving a fair compensation for running it, besides the benefits arising from the increased business that will be thrown upon the Madison road, while our means will be left free after the road to Anderson shall be completed, to push the work forward to the State line.

Our whole road is finally located, and, except a few sections, opened to the Ohio line, and we have every confidence that it will be in operation to Pendleton by the 1st of October, ready to receive the northern business, and if the iron arrives in time, as we expect, we can complete it to Anderson this season. We contemplate completing the grade to Muncie this season, and having the cars there the next, and at the State line by the autumn thereafter. This we can, and must do, if our subscribers will give us their promised aid, and the counties through which the road runs will do their duty."

Ship Timber from Wisconsin.

Large quantities of ship timber, consisting of oak knees, plank, etc., now lie in our ship yards and are being worked up into elegant ships after having performed a journey of eight to ten hundred miles, from the forests of Michigan and Wisconsin. Within a few days past, Wm. H. Webb has received fifteen hundred ship knees from Michigan via Buffalo and the canal, and another large lot is on the way from Wisconsin, for Messrs. Perrine, Patterson & Stack. Enoch Hunt, of Ohio city, is the mover in this enterprise, and is reaping the reward of his sagacity. A railroad having been built from Monroe, Michigan, at the western extremity of Lake Erie, into the interior of that State, he distributes through the adjacent country circulars describing the size and quality of the sticks desired, and they are soon forthcoming, and commence their long journey towards the rising sun. The woodmen engaged in the business of preparing this timber, are just beginning to know what is wanted of them, and the timber produced is of an excellent quality.—*Jour. of Commerce*.

Emigration from Great Britain.

We copy the following table from the London Chronicle of the number of emigrants who have left the United Kingdom during the past ten years, and the several places of their destination.

	North American colonies.	United States.	Australian colonies & New Zealand.	All other places.	Total.
1839	12,658	33,536	15,786	227	62,207
1840	32,293	40,642	15,850	1,958	90,743
1841	38,164	45,017	32,625	2,786	118,592
1842	38,123	63,852	8,534	1,835	128,344
1843	23,518	28,335	3,478	1,881	57,212
1844	22,924	43,660	2,229	1,873	70,686
1845	31,803	58,538	830	2,330	93,501
1846	43,439	82,239	2,347	1,826	129,851
1847	109,680	142,154	4,949	1,487	258,270
1848	31,065	188,233	23,904	4,887	248,089
1849	41,367	219,450	32,091	6,590	299,493

Total 441,034 945,656 142,623 27,680 1,556,993

A large part of the Europeans who land in the Provinces find their way into the United States.

The London "Builder" says of the Iron dome of the International Exhibition Hall: "The construction of this dome, 200 feet in diameter, tho' of light sheet iron, will be no joke. We may remind the reader that it will be double the size of our St. Paul's dome, which is about 112 feet in diameter. The dome of St. Peter's at Rome, is 139 feet in diameter, and that of the Pantheon 142 feet. This central hall will be a polygon of sixteen sides—four of which will open into gardens reserved around it. Its main walls will be of brick, and 60 feet high.

STATEMENT,
Showing the number and condition of each sort of Iron Works, and the capital invested in Land and Buildings in each County in Eastern Pennsylvania, in the year 1850.

County.	Anthracite Blast Furnaces.					Charcoal Blast Furnaces.				Cold Blast.				Bloomeries.		Forges.		Rolling Mills.		Total.								
	S* F	Un- fin'd	In.	Out.	Invest- ment.	S F	In.	Out.	Invest- ment.	S F	In.	Out.	Invest- ment.	S F	No.	Inv't- ment.	S F	No.	Invest- ment.	S F	No.	Invest- ment.						
Adams,						4	4	4	8	283,000		4	1	1	4,000					1		4,000						
Blair,						1	1	2	2	25,000	1	1	1	1	275,000	2	14	314,000	1	50,000	6	27	922,000					
Bedford,						2	4	4	4	201,000	1	6	2	8	10,000	2	3	18,000	4	6	4	6	53,000					
Berks,		1	1	1	65,000	2	4	4	4	201,000	1	6	2	8	325,000	5	23	310,000	5	310,000	8	41	1,231,000					
Bucks,		1	1	2	120,000															2		120,000						
Bradford,																												
Carbon,	1		1	1	2	15,000		1	1	2	80,000					4	11,700	2	12,800		1	10	119,500					
Cumberland,							2	1	1	2	215,000	5	5	5	159,000	3	4	75,000	1	75,000	10	12	524,000					
Columbia,	5		5	6	11	745,000	2	2	2	4	51,000	1	1	1	3,500	1	1	5,000	1	3	303,000	10	20	1,107,500				
Chester,			1	2	3	300,000						2	2	2	200,000	1	6	106,000	2	14	642,200	3	25	1,248,200				
Centre,							1	1	1	2	180,000	5	4	4	8	308,000	2	5	63,000	2	5	114,000	10	20	665,000			
Clearfield,									1	1	84,000										1		84,000					
Clinton,							1	1	2	3	195,000	2	2	2	2	10,000		1	15,000		1	6	220,000					
Dauphin,	1			2	3	103,000	1	1	1	2	100,000	2	2	2	2	40,000		2	19,000	1	1	20,000	5	9	282,000			
Delaware,																				1	1	16,000		1	16,000			
Franklin,							1	2	2	101,000	3	1	5	6	112,000	3	8	61,500	1	1	32,000	8	17	306,500				
Huntingdon,							6	6	3	9	345,000	4	3	3	6	230,000	5	11	256,000	1	2	65,000	16	28	896,000			
Juniata,																												
Lehigh,			5	1	7	410,000			1	1	60,000	1	1	1	1	8,000					1	9	478,000					
Lycoming,							1		1	1	25,000		1	1	2	50,000		2	28,000	2		47,500	1	8	150,500			
Luzerne,			2	2	4	270,000		1	1	1	20,000							1	12,000	1	2	400,000	1	8	702,000			
Lebanon,			1	1	1	3	195,000					2	1	3	420,000			3	70,000			9		685,000				
Lancaster,	3		1	5	3	305,000		3	2	5	335,000		1	1	2	95,000	2	12	223,000	2		315,000	5	30	1,273,000			
Mifflin,							3		4	4	95,000			1	1	10,000	2	2	60,000			5	7	165,000				
Monroe,															15,000						1		15,000					
Montgomery,	1		2	3	5	273,000							1	1	23,000	1	2	20,000	4		4	187,000	2	12	503,000			
Northumberland,	1		1	1	2	120,000						1	1	1	20,000		1	6,000			2	4	146,000					
Northampton,	1		1	2	1	260,000									2,000	1	1		1		35,000	2	6	297,000				
Potter,																												
Perry,							2		3	3	90,000	1		2	2	30,000	1	1	60,000	1		1	185,000	4	7	365,000		
Pike,																		3	45,000	2	8	307,000	2	11	352,000			
Philadelphia,																												
Susquehanna,																												
Sullivan,																												
Schuylkill,	1		1	1	2	40,000				2	53,500			1	1	14,000	4	6	127,000	1	1	20,000	6	12	254,500			
Tioga,							1	1	1	1	20,000									1		5,000	1	2	25,000			
Union,							2	1	2	3	31,000						1	1	6,000			3	4	37,000				
Wayne,																												
Wyoming,																												
York,							2		5	5	278,000						1	3	90,000			3	8	368,000				
	14	5	29	23	57	3,221,000	32	31	36	67	2,867,500	27	27	33	60	2,356,500	1	6	28,700	36	118	2,012,300	12	56	3,128,700	120	364	13,614,700

* Sold by Sheriff, or failed, since 1840.

† On two of these furnaces the work has been suspended over a year. On two others the work will be completed, but they will not be blown in.—The remaining furnace will be completed and blown in, as it is to take the place of another one worn out.

It is with infinite regret that we contemplate the present position of the two largest mining interests in the United Kingdom—the coal and iron trades. We fear that a vast amount of capital invested in these great branches of our national industry is at this moment unproductive of any profit. The causes which have led to this melancholy result are various, but that most apparent is the stimulus which was given to the demand by the mania for railways in 1845 and 1846. The productive power which now exists is gigantic, and, as it appears to us, most unwisely is this power wielded. A sort of war of extermination is being waged; all are trying to raise or make the most, and sell the cheapest. The weakest must, before long, go to the wall, for it is clear that vast quantities of coal are now raised, and much iron is made and sold at less than the cost. The probable loss of a part of the American market, is a matter which will aggravate the difficulties of the iron trade, and the sorry plight of all the railway companies, great and small, of this country and of France also, does not tend to raise better hopes. The prudent course, under such circumstances, is perfectly manifest, and that is, to gradually diminish the get of coal and make of iron. This is the course which an individual would take, and which the whole trade might readily adopt with one consent, not in accordance with any agreements or regulations, but as a general rule of conduct from one end of the kingdom to the other. The supply is clearly greater than the demand, prices are ruinously low, and they must fall lower if the quantities are not decreased. A united effort will rapidly bring about an improve-

ment, but a continuance of the present system of conduct will cause a wide-spread scene of ruin.—*London Mining Journal.*

Accident on the Erie Railroad.

We copy the following from the note of the President relative to the late accident upon this road. He says:

"This iron bridge, the giving way of which caused this accident, was the only one of the kind on the road, and when put up was supposed to be perfectly safe, and to possess many advantages over wooden structures in its greater strength, durability and exemption from fire.

It was not an experiment; but had been used before on several other roads, and had proved satisfactory. It was supposed to be perfectly safe up to the moment of giving way—but the fact of its giving way without any previous warning decides the question in the minds of the directors as to the entire disuse of iron bridges for the future. The one just destroyed has been replaced with a substantial wooden structure. There are two more small iron bridges remaining on the road, and those of different make and pattern, and supposed to be perfectly safe, but they will be removed as soon as possible, and their places supplied with wooden bridges; until their removal they will be secured beyond the reach of accident by wooden supporters. Without expressing any opinion as to the comparative safety of iron or wooden bridges, the directors have decided to use no more iron bridges.

In order to secure the safety of their bridges and

of lives of passengers, the company have always had a careful superintendent of bridges, of great experience, whose duty it is to give constant attention to the safety and security of those important structures; and had the bridge in question been constructed of wood, the indications of giving way would have been timely detected."

Query for Scientific Men.

In what manner does a diamond act upon glass, so as to cut it? That it does not penetrate its substance is obvious to any one who will attend to its operations; for it only divides the exceedingly attenuated pellicle on the surface, and penetrates no deeper. The best cut of a diamond is when it makes the least noise in passing a line, and it cuts in the same manner the thickest as well as the thinnest plates of glass. The *Encyclopedia Americana* says: "It is very remarkable that only the point of a natural crystal can be used. When cut or split, the diamonds scratch, but the glass will not break along the scratch, as it does when the natural crystal is used." Again, the crack is often found to follow the diamond after it has passed several inches. That it does not cut it by dividing the pellicles is clear, because a piece of quartz will do the same by passing in the same line repeatedly, yet will not break true. Then how does the diamond act?

Maine.

York and Cumberland Railroad.—Director for the ensuing year: F. O. J. Smith, Levi Morrell, and George Warren of Westbrook, John A. Poor, Abner Shaw and N. L. Woodbury of Portland, Josiah Pearce of Gorham, Benjamin J. Herrick of Alfred, Timothy Farrar and J. T. Paine of Boston, John A. Burleigh of Great Falls, Benjamin Barnes of Dover, Rufus McIntire of Parsonfield. The directors were instructed to commence operations on the western terminus of the line as early as practicable.

This road is now in operation to Morrill's Corner, Westbrook.

Illinois.

Alton and Sangamon Railroad.—In order to satisfy, as far as is in our power, the public inquiry, in relation to the progress of the Alton and Sangamon railroad, we take this occasion to state, that all the timber for the depot and engine house has been procured, and is now being sawed—that 3,500 tons of iron for the use of the said road has been purchased, and is to leave Leeds by the 1st of October next, and be delivered at New Orleans by the 1st of January following—that the ties have been contracted for and already partly delivered here—and that the contracts for the construction of the locomotives and cars to be used on the road are believed to have been closed by this time. According to the terms of the contract, active operations on the road were to have been commenced on the first of this month; but we learn from a telegraphic dispatch, that the principal sub-contractor has been detained at Springfield, Ohio, by sickness. He was, however, convalescent at the last accounts; and is probably now on his way to this city.—*Alton Telegraph.*

New Hampshire.

Cocheco Railroad.—We understand, says the Dover Enquirer, that the Cocheco railroad, from Farmington to Alton Bay, is to be immediately located under the direction of Thomas S. Williams, Esq. Marshall Conant, Esq., has been engaged to make the necessary surveys, etc. The amount necessary to complete the road to Alton Bay, and pay off the floating debt of the company, is about \$200,000—of this amount \$70,000 has already been obtained.

Peterboro and Shirley Railroad.—This road will be completed to the town of Mason in September, so as to be in operation at the time of the celebration of the settlement of New Ipswich.

Worcester and Nashua Railroad.—This road is steadily and quietly working its way into public confidence and favor. The earnings of the road for the month of July show a handsome gain upon the same month last year.

Earnings in July, 1850.....	\$13,883 40
“ “ 1849.....	10,466 32
Increase.....	\$3,417 08

The earnings from January 1st to August 1st, seven months, have exceeded in the sum of \$16,401 71, the earnings in the corresponding seven months of 1849; which is a gain of 27 per cent., and in a dull year for business. The debts of the company having been disposed of, a dividend on the stock will undoubtedly be paid in January next.

New York.

Ogdensburg Railroad.—The superintendent of the Ogdensburg railroad, in anticipation of its being opened on the first of October next, from Ogdensburg to Lake Champlain, has given notice

that the following articles, in quantities of not less than ten tons each will be carried as thro' freight, at \$3 per ton of 2,000 lbs. during the present year, and that no charge will be made for wharfage at either end of the road this season, viz: iron, (pig, bloom and bar) nails, spikes, molasses, sugars, coffee, teas, liquors, salt, salt fish, mineral coal, copper, copper and iron ores, pot and pearl ashes, salted beef and pork, hams, lard, tallow, flour, meal and grain (in sacks, casks, or barrels) lime, plaster, potatoes and other roots (in sacks or casks, at risk of weather by owners,) wool at \$4 per ton of 2,000 lbs. Flour in quantities of 500 bbls. and upwards will be carried as through freight, at 25 cents per bbl. Seasoned pine boards will be carried as thro' freight at \$2 50 per 1000 feet board measure, to be loaded and unloaded by the owner.

English Iron Trade.

The trade remains in a critical position. During the whole quarter the generality of our works have not had more than half employment, and that without profit; and while it is abundantly evident that great difficulty would be encountered before a reduced scale of wages could be established, there is no probability that prices of iron will rule higher. An important subject has lately occupied the attention of some of the leading merchants connected with this trade, viz: the heavy duties that are levied by foreign states upon British iron, and a proposal has been made to form an association for the purpose of obtaining a remission or alleviation of such imposts, but the appeal seems to have as yet excited little attention in Staffordshire. The duties upon iron in the German Customs League, France, Austria, Spain, etc., are very heavy, and form a serious obstacle to the extensive transactions we might otherwise have with those countries. The tariff of the Zollverein is also at this time on the eve of being revised, and the German manufacturers, like those of the United States, are very clamorous for higher protective duties. How far they may succeed remains to be seen; but the present depressed state of the trade, and the almost entire destruction of our own home market, make it a matter of peculiar interest to the iron master at the present moment.—*Birmingham Gazette.*

The usual meeting preliminary to the ensuing quarterly assemblages of the iron masters of South Staffordshire and East Worcestershire, was held at Mr. Bolton's the New Inn, Handsworth, on the 27th ult., and was numerously and influentially attended. The present state and future prospects of the trade were discussed, and ultimately it was unanimously resolved that the prices adopted at the last quarterly meeting in March should be maintained.—They may be stated as follows: bars £6 per ton; nail rods £6; hoops £6 10s.; sheet £7 10s.; pigs from £2 15s. to £3 7s. 6d., at the works. From the discussion which occurred at this meeting it may be gathered, that although the iron manufacture of the district is greatly depressed, it is not suffering to the extent which some persons have described. The Welch trade is better; but little can be said in favor of the Scotch iron manufacture.—*English Railway Times, July 6th.*

To the Editor of the American Railroad Journal.

MARION, O., Aug. 12th, 1850.

Dear Sir—I have read with much pleasure an article signed “St. Louis,” published in the Journal of August 3d. The object of the writer “is to claim your aid, (in conjunction with the press generally of the Western States,) in procuring from the government a fair examination of the country between our western boundary [alluding to Missouri] and the Pacific, and a survey of the route and passes which are eligible for a road or railroad.”

That is precisely what the people want from government, and at present, they want nothing more. It is not necessary, or expedient, that Congress should commit the government in behalf of any particular plan for building the railroad, at least in the present stage of the proceedings. Nei-

ther Mr. Whitney's, nor the Boston Plan, nor any other special mode of actually doing the work, should be decided upon now; but, in justice to the immense interests concerned, Congress in behalf of the whole nation, should, at this session, make provision for extensive and thorough surveys, and at the earliest practicable period, establish the main route across the territories.

The convention of distinguished citizens from fourteen States, assembled in the city of Philadelphia in April last, unanimously adopted the resolution “That this committee recommends to the American people, in all parts of our common country, to urge upon Congress, by numerous petitions, to make an early and an ample appropriation, for surveys for the most feasible routes for the construction of a direct railroad to California and Oregon, from the valley of the Mississippi.”

Congress need not waste time in discussing the mode of building the road, but if in obedience to the known will of the country, a bill should be passed making the requisite appropriations, every body would be satisfied, and the surveys could forthwith be commenced.

By establishing the best route, by the opening of a good common road along that route, and by offering the strongest inducements for actual settlers to take up the lands along that line, the country would soon be settled: and the first proper preliminary steps would thus be taken. Every thing else would follow, naturally, and easily:—the erection of government posts at suitable points, the construction of a line of telegraph, and finally the railroad itself.

Quite as soon as the railroad proper can be commenced, we shall have continuous lines of railway stretching from Boston, New York, Philadelphia and Baltimore, to the western boundary of Missouri—more than one-third of the entire distance across the continent. Not a day should be lost in urging forward its extension to the Pacific, for it cannot, with the united energies of our whole people, be finished one day before the commercial interests of our country will demand it.

Our government, since the glorious proclamation of liberty first sounded through our wide spread land, has never undertaken a more magnificent scheme, or one better calculated to promote the good of the whole country.

It is not a sectional, or a party measure; for, as was suggested in the Philadelphia Convention, the grand trunk line to be built under the auspices of the general government, may strike some point west of Missouri, from whence three grand lines may be constructed to Memphis, to St. Louis and to Chicago, thus bringing the south, the middle and the north, in direct communication with our noble possessions on the Pacific, by the grandest thoroughfare in the world.

When this railroad is completed, instead of occupying four or five months on a tedious and dangerous sea voyage round Cape Horn, or six or eight weeks by way of the “deadly Isthmus of Panama,” we may pass from New York to San Francisco in five days, at much less cost, and free from the risks attending either of the routes now followed by thousands upon thousands. The travel and freight business which this great continental railroad will command must in the nature of things be enormous, affording a splendid revenue, whilst extending at the same time such vast facilities to our country and to the world at large.

In every aspect in which it can be viewed, this gigantic railway is worthy of our government, and

worthy of the age in which we happily live. It should be the labor and pleasing duty of every true statesman, and of every lover of his kind, to encourage and hasten on its completion.

It will be a monument, to which all Ohio now and in its accomplishment, will hereafter proudly point, as the greatest and best public work which any country has ever produced.

Yours, truly,
PACIFIC.

AMERICAN RAILROAD JOURNAL.

Saturday, August 24, 1850.

Shall Congress Aid the Construction of Railroads by Grants of Lands?

Every person in the United States who has anything to buy or sell, is benefitted by the Erie Canal. It is the great channel by which western produce reaches the manufacturer; and as cheap production is based upon cheap food, the price of the manufactured article he purchases is just in proportion to the cheapness with which the manufacturer can obtain the food for his labor. If this great avenue should be closed, the prices of every kind of domestic fabrics would permanently advance. So important is this great work to all the interests of the country, that there are many States which have received a greater advantage from it in the diminished expense of transportation, than the whole cost of it.

The Erie Canal may be properly put as a striking illustration of the benefits derived from every work of a similar kind. They differ from this only in the degree of good they confer. Every part of the country therefore is interested in the success of every line of railroad that is built or in progress. Where therefore a proposed road, from its extent or connections, becomes national in its influence and benefits, it may properly become a recipient of government aid, and its encouragement is justified on the ground of a wise economy alone; on the ground that the whole country will be benefitted by it to a greater extent than the amount of aid granted.

However beneficial a proposed work may promise to be, we should oppose any direct aid to it in money. We do not believe it to be good policy for the general government to connect itself with the public improvements of the States. But it can effectually aid lines of great public utility by grants of lands which are of little value to itself, but which may be very valuable in the hands of those engaged in the construction of railroads.—This aid must of course be limited to lines running through, or in the vicinity of these lands, and the grants may be justified on the ground that the government is the gainer from the increased value of the lands it retains. It is also the duty of the government to foster and promote the settlement of the country. This duty has been repeatedly recognised by extensive grants of lands having this object alone in view.

Those asking aid, therefore, have abundant precedents in their favor. They ask nothing that has not been previously granted to others. The aid they seek is to benefit the whole country to a vastly greater extent than its amount. In addition to these reasons, there seems to be every probability that unless some such useful disposition is made of our public domain, it will be entirely frittered away upon useless and undeserving objects—that it will become the subject of political intrigue and corruption, and will not only be lost to government,

but be productive of actual evil in its distribution. By timely action it may now be made the source of the most beneficent results to the whole country, not only in the advancement of its material interests, but in promoting a spirit of harmony and good will, based upon the more intimate connections it can be made to secure.

Some of the lines which we desire to see aided, are the Mobile and Lake Michigan, the Pacific railroad, from St. Louis to the west line of Missouri, the Rock Island and Council Bluff railroad, the Alabama and Tennessee, and the Memphis and Charleston railroad. There are others of less importance which should receive similar encouragement. Bills granting aid to all of the above lines we believe have passed the Senate, and we hope soon to chronicle their passage through the House of Representatives.

Central Railroad Route between the North and the South.

There now bids fair to be constructed within a very few years, a direct and continuous line of railroads, connecting all the leading northern Atlantic cities with New Orleans. This line will diverge from the present travelled route at Washington or Alexandria, striking from thence to Lynchburgh, Va.; thence by the Virginia and Tennessee railroad to the Tennessee line; thence by the East Tennessee and Virginia railroad, and the East Tennessee and Georgia railroad, through Knoxville and Chattanooga, to the northern terminus of the Alabama and Tennessee railroad; thence by the last named road to Selma on the Alabama river, thence by the river and gulf, by steamboat, to New Orleans. A road will, without doubt, ultimately be constructed from Selma direct to New Orleans; but the line indicated above is the one which for the present will be followed. A glance at a map of the United States will show the directness of this route. It is one to which the natural configuration of the country will allow no rival, unless it pursues the same path.

Almost the whole extent of this great line of railroad is now in progress. The first southern link in this great chain from Selma to the bend of the Tennessee river at Gunter's Landing, the probable northern terminus of the Alabama and Tennessee railroad, a distance of about 200 miles, is now in progress. The route of this road traverses one of the most fertile as well as the richest portions of Alabama. The people on its line possess sufficient means for its construction. Its management is in able and efficient hands. Those interested in it are fully aroused to its importance, and are ready to contribute to it most liberally, and we see no reason why it will not be constructed with all the despatch practicable in a work of such magnitude.—From Gunter's Landing to Chattanooga, the line for a portion of the distance will be supplied by the Nashville and Chattanooga railroad, which follows down the Tennessee river into Alabama, before crossing. The remainder of the distance between Chattanooga and Gunter's Landing is, we believe, unprovided for. It may perhaps be supplied in part by the Memphis and Charleston railroad.

From Chattanooga a branch will be required to the East Tennessee and Georgia railroad, to save the circuit by way of Dalton. This can be easily constructed, and we presume will be built by that company as soon as it shall be wanted to make the line complete. The East Tennessee and Georgia railroad is in a state of great forwardness. Iron for eighty miles of the road has already been pur-

chased, and the whole line to Knoxville will be completed at an early day.

The construction of the line from Knoxville to the Virginia State-line has just commenced. The engineer of this road, Lloyd Tilghman, Esq., expresses the utmost confidence in the ability of the inhabitants on the route, with such aid as may be reasonably expected from abroad, to build it. Following the valleys, made by the Tennessee river and its branches, it is of easy construction. From the enthusiasm manifested in its favor, it bids fair to command the entire ability of those interested in it. We believe that we may set down this road as certain to be constructed within a reasonable time.

From the Virginia State-line the Virginia and Tennessee railroad will take up and extend this great chain to Lynchburgh. A large section of this road is under contract. The State subscribes three-fifths of its stock, and the balance can be readily furnished by private subscriptions, if the people on its route will do but half their duty. The Orange and Alexandria railroad will supply the greater part of the distance between Lynchburgh and the Potomac. That portion of the line from the southern terminus of the last named road and Lynchburgh is, we believe, unprovided for. The Orange and Alexandria is under contract, with sufficient means to secure its early completion.

Such is a statement of the condition of the various works which are to make up this great line.—In directness it will be unrivalled. In natural attractions we do not know of a line of equal extent in any part of the country which can compare with it. It will run between parallel ridges of the Allegheny Mountains for more than 500 miles. The country it will traverse is not excelled in natural resources by any portion of the Union. The construction of this great line in a comparatively short time is now rendered certain, and when completed, it must ever constitute one of the most conspicuous and important lines of intercommunication in the country.

Western Credits.

It is certainly very gratifying to witness the increased favor with which western securities and western enterprises are now regarded by capitalists, compared with the limited credit they enjoyed a year or two since. One extreme is sure to follow another, and there may be some danger that the facility with which western securities can be negotiated in this market, added to the growing disposition on the part of eastern men to engage in these enterprises, on their own account, will lead to a too rapid expansion of these works. Only such a portion of our capital can be permanently invested without embarrassment to business. The danger of over-investment is strikingly illustrated by the present condition of Massachusetts. The same drafts that the New England railroads made upon the money capital of Boston, the roads of other portions of the country are now making upon New York. While therefore we would encourage the construction of public works, the proper way to do this most effectually is to secure to them healthy growth.

Railroads create wealth just in proportion as they reduce the cost of transportation. So far they replace immediately the capital invested in them.—Their value in this way may be more accurately measured than by the dividends they pay. Subject to this test the importance of railroads to the west becomes the more striking. In many parts of the Mississippi Valley the cost of sending agricul-

tural products to a market, is greater than the cost of production. A railroad then becomes a greater item in the production of wealth than a fertile soil. In the increased price obtained for the staples of a country, a railroad may pay for itself in a very short time; consequently, its cost is not felt as a burden after this is accomplished. There are very few railroads in the west that will not in this way pay for themselves in a very few years, to say nothing of their dividends or increased value they give to real estate. Dividends may be, and often are, very uncertain evidences of what a railroad is doing for a country. They may be derived by taxing transportation and travel more than these can bear, and consequently may impoverish instead of enriching a country.

In the Mississippi valley all the vast surplus of its products are exported to distant markets. Agriculture being the sole pursuit, all that is consumed, that the soil does not produce, is imported. The amount of transportation to the individual is therefore much greater there than in the eastern States, where the great variety of pursuits enables every man to supply his wants from the products of his neighbors. In New England, for this reason, all the roads through the agricultural sections have proved failures as far as regards investments. The New England farmer has but little to export. The west furnishes a great part of his breadstuffs. His only surplus which he has to send to market is stock and wool, and these are very limited in amount; consequently we find that roads cease to pay as soon as they are extended beyond the manufacturing districts. These facts were entirely overlooked by the projectors of these works; and as all the northern roads are built at very high cost, the disastrous condition of things which we now witness was unavoidable. The western railroads are built at about one fourth the cost of the eastern roads. With the same amount of business they would be good property, while the latter would be nearly worthless.

The western roads not only cost much less than the eastern, but for a long time to come they will be much better managed. Their construction requires the concurrence and favor of the whole community. At the present time a person who should attempt to benefit himself by thwarting or embarrassing a work of this kind would not be tolerated. The only Bulls and Bears there, are such as harmlessly roam over her wide prairies. The *manufactured article* has not yet crossed the Alleghanies.—The same amount of pay commands a much greater amount of service in the west than in the east. The lands necessary for a railroad are usually a gratuity. So, to a great extent, are the services of directors and officers. The necessity that is felt for the roads is accompanied with the conviction that the whole strength of the community is required to build it. This conviction of itself secures the most rigid accountability, and the most economical expenditure of means.

Improvement in Iron Manufacture.

We have been favored with the following extract from a letter from a reliable source, relative to an improvement in the manufacture of iron, which we understand has been introduced with great success into a furnace in Scotland:

"We learn that a leading iron manufacturer in this neighborhood has lately fitted up a furnace for the manufacture of pig iron upon the principle of conducting the coal gas that escapes from the mouth of the furnace and bringing it by flues underneath.

This furnace turned out 245 tons in one week under this new process, against 180 per week, the greatest yield ever made in the old way. The amount of coal consumed per ton was only 2,600 lbs. against 4,200 lbs. per ton by the old process."

Notice to Contractors.

COVINGTON & LEXINGTON RAILROAD.
Sealed Proposals will be received at the office of the Covington and Lexington Railroad Company, in the city of Covington, until the 10th day of September next, for grading twenty miles of the Covington and Lexington Railroad, commencing at Covington and extending up the valley of the Licking river. The proposals will include all the excavations, embankments, and masonry for culverts—also the masonry for bridges.

Plans and specifications of the work to be done, and the terms of payment, may be seen at the office of the company, at any time between the first and tenth of September.

SYLVESTER WELCH,
Engineer Covington and Lexington R. R.
Covington and Lexington Railroad Office,
July 21st, 1850. }

Iron Bridges.

The cause of the giving way of the iron bridge on the Erie railroad is believed to be the pressure of the ends of the bridge by expansion from extreme heat, against the abutments. This threw the bridge out of a true line, and of course diminished its strength. Such is the opinion of persons well qualified to judge in these matters.

We wish this company had made this the occasion to examine into the subject of the comparative safety of iron and wooden bridges instead of condemning the former, without offering any reason for their decision. Wooden bridges rely upon iron for the greater part of their strength. The proper question to be settled is this, whether it is safer to use iron in connection with wood, than without it. The wire bridge is probably the safest in use. In the truss it may be safer to use iron in combination with wood. Here is a case for the *Savans* to settle.

The Panama Railroad.

Mr. G. E. Sellers, of this city, has been appointed Mechanical Engineer of this road, to reside in New York, and an excellent appointment it is.—The company are now prosecuting their work vigorously. It is contemplated to complete the work to Georgona by June, 1851, and the whole in two years. The road will be first laid to Chagres on piles, to be filled with the excavations on the line. The rail is to be made of wood found along the line, is so hard that it is difficult to work it by common tools, and will, of course, be broader than the iron rail. A large portion of the locomotives, cars &c. will be constructed in this city. The pile driving machinery is to be forwarded from Utica, N. York.—*Cin. Gaz.*

Rhode Island.

The Woonsocket Union Railroad bill, which lately passed the General Assembly of Rhode Island, charts a road from Woonsocket to the State line at Killingly, there to connect with the road already chartered by the State of Connecticut from Willimantic to that place. These sections of road are designed to form a part of the "Air Line" to this city in conjunction with the Norfolk County road now open to Blackstone. A glance at the map will show that the completion of these two roads will form the most direct and expeditious railroad route to New York. The whole distance to be built over, in order to make the chain continuous, is about forty miles.

Railroad by the Sault Ste. Marie.

The railroad across the Portage is progressing finely, all the heaviest part of the work in grading being already done. They will commence immediately laying down the timber for the track, and, by the first of October, it is expected the cars will be running.—*Lake Superior Jour.*

Maine.

The receipts on the Atlantic and St. Lawrence railroad for the month of July, 1850, were

From passengers.....	\$9,352 46
freight.....	5,479 35

Total.....\$14,831 81

The Great Eastern Railroad.

We see by the Provincial papers that the people of the Lower British Provinces respond with zeal to the views expressed and measures recommended by their delegates in the great convention recently held at Portland. This work will command their entire energies and resources, and these we believe to be equal to the task before them. We have no doubt but that government aid will supply what will be lacking of private subscription to complete the work.

Although the Provincials claim that the road through their portion of the country would pay as an investment, they do not base their reasons for its construction on this ground alone. They are going to construct it as a means of making available their resources, which are now lying dormant, and which require the stimulus of a railroad to bring them into use and notice. Unless they can construct this work, all their interests will continue retrograde as they have done for years past. They look upon the money to be expended in making a railroad as an investment for making other kinds of property valuable. The aggregate increase of the value of the whole is to compensate for any loss incurred in the construction of the road.

We think that a field is here opened for some of our Yankee contractors, and we soon expect to hear from some of them in this new quarter.

Mining Agency.

We take pleasure in calling particular attention to the Advertisement of Captain O. H. Matthews, mining agent, now at Toronto, Canada. Mr. M. has been most favorably known for several years, in connection with mining operations on Lake Superior, as well as for his scientific attainments and practical knowledge in this business. Parties or companies wishing to engage in mining, or desiring information in regard to mineral localities, will find it to their advantage to apply to this gentleman.

For the American Railroad Journal.

Railroads in New York.


In your paper of a recent date you alluded to the extension of railroads in the streets of cities. This is an important matter and one that should be early considered in New York. The locomotive engine is the safest power to move property and persons on rails in a street that can be used. It is never capricious in its movement—it proceeds upon the same line. It may be regulated to any rate of speed required. It will move the largest number of persons, or amount of property with the least occupancy of the street of any power whatever.

For a large train filled with persons, or loaded with property, it actually occupies the street not much more than a single omnibus or a large loaded dray. The principal objection made to the use of this power is that horses will be frightened by

it. A ready answer is that horses very soon become used to it, and where the locomotive is in common use in the streets horses are no more frightened at them than they are at canal boats or steam boats. They very soon become accustomed to them.

The locomotive will move passengers in cars upon rails in a crowded city more safely to themselves and to all others using the streets than they can be moved by animal power in any way whatever.

The practice that obtains in some cities of drawing out cars single when loaded, by horses, and after enough are so drawn out through the streets, to form a train of them for the locomotive is really a childish way of doing the business. It occupies the streets more and is more hazardous than if the whole are formed into a train at the terminus and drawn out at a proper speed by the locomotive.—Time is saved, and the railroad is thus made far more efficient and more comfortable to passengers. Every consideration that adds to the efficiency and comfort of the railway is an importance to the city. The railroad to be right should be so laid and managed as to do its whole business by the locomotive without steamboat or horse connection. Streets in cities must be used for this great improvement. It is a legitimate public use of them, for in no other way can so great a transit of persons and property be made. The sooner the great lines are operated by locomotives to and from the centre of the city, the quicker shall we derive the important advantages that the railways will surely produce. W.



EMERSON'S


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CORRESPONDING
VENTILATORS,

For Ships, Steamers, etc.,

Manufactured by

CHILSON, ALLEN, WALKER & CO.,
351 Broadway, New York.



Notice to Contractors.

SEALED PROPOSALS will be received at the office of the James River and Kanawha Company in Richmond, until the 1st day of October next, for the construction of the Piers and Abutments of the Bridges across James River at New Canton, Hardwickville and Bent Creek. This work will be paid for in cash. Besides the usual reservation of 20 per cent. on the monthly estimates, the contractor or contractors will be required to give ample security, satisfactory to the Board of Directors, for the completion of the work at the time and in the manner specified in the contracts.

Plans of the above works will be exhibited and specifications thereof delivered to the contractors at the office of John Couly, the Assistant Engineer in charge of the same in Columbia.

WALTER GWYNN,
Chief Eng. J. R. & K. Co.

August 16, 1850.

MINING AGENCY. Capt. O. H. Matthews,

Civil and Mining Engineer, F. G. S., London, etc.
HAVING completed his three years engagement on Lake Superior, is open to negotiate for another appointment as Mining Agent, or Superintendent of Mines. Also, to give his opinion and advice upon Mineral Lands, to Buyers and Sellers of Stock, or to be consulted on any section in this important branch of national industry.

The most implicit confidence may be relied on, and immediate attention given to all communications (pre paid). Address Capt. O. H. Matthews, Toronto, July 27th, 1850. 3m

Great American Engineering

AND MECHANICAL WORK, just published in medium folio One Dollar, 75 cts. to Subscribers. Part VII of "Specimens of the Stone, Iron & Wood Bridges, Viaducts, Tunnels, Culverts, &c., &c., of the United States Railroads." By George Duggan, Architect and Civil Engineer.

The present part contains beautifully executed plans, elevations, sections and details of the elegant timber Bridge, (Burr's Patent,) 150 feet span, across Salmon River, Malone, on the line of the Northern-Ogdensburg-railroad, and isometrical views of Bridges 30, 40, 60, 82 and 88 feet span on the line of the Utica and Syracuse railroad, with specifications, form of contract, &c. &c., for the Connecticut River railroad.

"It is a work that was a great desideratum, and must prove of great benefit to the engineering profession generally, and especially to the tyro in practical engineering and mechanical knowledge; in truth it strikes us, that it would require years of labor and patient toil on the part of a young engineer to prepare the drawings, and collect the information that will be embodied in this work, and can now be secured for the trifling sum of \$9"—[Scientific Amer. March 16, 1850.]

In connection with this subject (Iron Railroad Structures) we take occasion to call attention again to Mr. Duggan's valuable and expensive publication, exhibiting drawings, with full descriptions of the various stone, iron and wooden bridges, viaducts, tunnels, culverts, etc., of all the Railroads in the United States. Mr. Duggan is an accomplished Architect and Civil Engineer, who came from Ireland to this country to exercise his profession; but finding Railroad construction here, in many respects, different from that he had been accustomed to in Europe, he applied himself to the study of our system; and the fruits of his researches and investigations embodied in this work, are well calculated to meet the exigencies of engineers, and to assist draughtsmen, bridge builders, mechanics and students.—[N. Y. Journal of Commerce, Feb. 14, 1850.]

Published by **GEORGE DUGGAN,**
300 Broadway, New York.

To whom all communications should be addressed, and subscriptions forwarded.

Gloucester Iron Works, GLOUCESTER, NEW JERSEY, NEARLY OPPOSITE PHILADELPHIA.

THE subscribers having made extensive alterations in their works, are now prepared to receive orders for all kinds of Stationary and Marine Engines, Boilers, Locomotives, Sugar Mills, and every description of Mill Work.

Also—Orders for Iron and Brass Castings executed with despatch.

Having secured the valuable services of Mr. David Matthew as Superintendent (who has been for five years foreman in the Iron Works of John Watchman, now the Vulcan Works, Baltimore, and for 12 years superintendent of the Mohawk and Hudson and the Utica and Schenectady Railroads, New York,) they feel confident that all orders entrusted to them will be faithfully executed.

Having an extensive Wharf in front of their works, it will afford a safe harbor for all classes of steam vessels that may require repairs during the winter.

C. M. & J. C. SITER.

Gloucester, July 24, 1850. 1m.

Rosendale Cement.

THE NEWARK AND ROSENDALE LIME AND CEMENT CO. are now manufacturing at their works in NEWARK, N. J., and Ulster county, N. Y., a very superior article of *Hydraulic Cement*—also Lime Calcine Plaster, etc. Contractors and dealers will find it to their advantage to call or make application before purchasing elsewhere. All communications addressed to the subscriber, at Newark, N. J., will be punctually attended to.

1y*15

HENRY WILDE, Secretary.

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THEODOLITES, TRANSIT COMPASSES, and Levels, with Fraunhoffer's Munich Glasses, Surveyor's Compasses, Chains, Drawing Instruments, Barometers, etc., all of the best quality and workmanship, for sale at unusually low prices, by

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CUT NAILS OF BEST QUALITY, BAR IRON (including Flat Rails) manufactured and for sale by **FISHER, MORGAN & CO.,**
75 N. Water St., Philadelphia.

Great Work on Bridge Building, etc., etc.

JUST published in medium folio, One Dollar, 75 cts. to subscribers.

Part I. of a "THEORETICAL AND PRACTICAL TREATISE ON THE CONSTRUCTION OF BRIDGES IN STONE, IRON AND WOOD," By George Duggan, Architect and Civil Engineer.

The present part contains beautifully executed plans, elevations, sections, and centering, of the Bridge of St. Maixence, France, by M. Perronet, the eminent Architect and Engineer, and plans, elevations, sections, and details of the oblique Timber Bridge, 700 ft. long, constructed for a double track across the River Tyne, on the line of the Newcastle and Carlisle railroad, by John Blackmore, C. E., with an introductory article on the relative merits of the various materials employed in the construction of Bridges, as regards economy, strength and durability, and critical remarks on the various forms of bridges designed and constructed by the most eminent architects and engineers in Europe and America.

"PART VI. of Specimens of the Stone, Iron and Wood Bridges, etc., etc., of the United States Railroads," By George Duggan, Architect and Civil Engineer, contains specimens of the plates and letter press intended for the APPENDIX, being the commencement of a complete Treatise on the Theory and Practice of Bridge Building. This will be one of the most valuable works on the subject ever presented to the attention of engineers in this country—condensing the most important information on this branch of architecture contained in the writings of the most eminent scientific men in the French, German, Italian, and English languages, in the course of the last and present century. It will be illustrated by numerous accurate representations of bridges of the greatest celebrity in modern times. Elaborate articles will be given on the strength, property, and uses of the different materials employed, and on the most approved methods of constructing Coffier Dams, Foundations, Centering, etc., with descriptions and drawings of the various engines and Machines that were found most useful in constructing the works, and a selection of such specifications as may be of service to the practical bridge builder. The sixth number treats of the Application of Iron to Railroad Structures, and is illustrated by beautiful drawings of the Bridge across the Delaware at Saw Mill Rift on the Erie Railroad, and of the bridge over Fairfield street, on the Manchester and Birmingham Railroad. The great success of this work thus far is the best tribute to its scientific merit and its adaptation to the wants of the American engineer."—[New York Daily Tribune, June 28, 1850.]

Published by George Duggan, 300 Broadway, New York, to whom all communications should be addressed and subscriptions forwarded.

Parties remitting Mr. Duggan \$5. and the remainder \$4 when they have been supplied with the first six parts of the "Theoretical and Practical Treatise on Bridge Building, etc.," shall receive it monthly as published. To those making Mr. Duggan a present remittance of \$9, the work will be forwarded post free to any part of the United States.

American Railway Guide, AND POCKET COMPANION FOR THE UNITED STATES;

CONTAINING Correct Tables, showing the time for starting of trains from all stations, distances, fares, etc., on all the Railway lines in the U. States; also many of the principal Steamboat and Stage routes—accompanied by a complete RAILWAY MAP. Price, single copies 12½ cts., or \$1 per annum. Published on the first of every month, corrected from returns furnished by the Railway Superintendents throughout the Union.

This book has been compiled somewhat on the plan of Bradshaw's Guide, with such improvements in size, form and arrangement as have seemed desirable; and the publisher confidently hopes it will not be found liable to the objections of incompleteness and incorrectness, which have been made, and justly too, against various other similar works heretofore issued.

The subscriber having had the management of the NEW YORK PATHFINDER almost from its commencement, has enjoyed superior facilities in obtaining information relating to the thoroughfares of travel, and is therefore well qualified to prosecute with success the arduous undertaking of furnishing a complete and correct national guide book.

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WE are prepared to enter into arrangements for supplying our Cement for public works or other purposes. We warrant the cement equal in every respect to any manufactured in this country. It attains a great degree of hardness, sets immediately under water, and is a superior article for masonry coming in contact with water, or requiring great strength.
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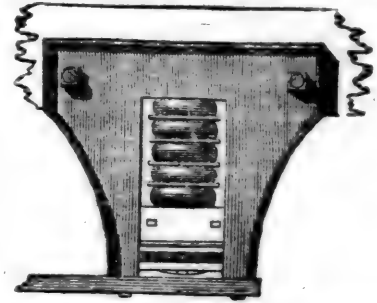
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THESE SPRINGS ARE THE CHEAPEST,
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Other parties through Mr. Ray set up claims to an India Rubber Spring which, though the same in principle, is very inferior in its working and durability.—Actions are in progress for an Infringement on Fuller's Patent against parties using that Spring.
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"It will afford me pleasure to recommend your springs to the companies in this region, in preference to Ray's which I am confident are inferior in mechanical arrangement to yours."
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"I do not hesitate to allow you to say that I concur in Mr. M' Rae's opinion that Ray's springs are inferior in mechanical arrangement to Fuller's. I repeatedly expressed that opinion long before Mr. M' Rae had seen your springs (as I believe) and entertain it still."
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December 26, 1849. }

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February 9, 1850.

6in*

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A Pig Iron, Hammered Railroad Car and Locomo-
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Models of this Track, on the most improved plans,
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Manufacture of Patent Wire ROPE AND CABLES,

For Inclined Planes, Suspension Bridges, Standing
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E. BROWN AND SON Mathematical inst. mak-
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ALSO

WROUGHT IRON SHAFTING,
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Railroad Iron.

3,000 TONS C. L. MAKE 63½ lbs. per yard,
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Also contracts made for future delivery of above su-
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300 Tons Banks Best Iron, Round, Square and Flat.
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10 " 9-16 Square Iron for Railroad Spikes.

For sale in lots to suit purchasers by
DAVID W. WETMORE.
New York, March 26, 1850. 3m

Railroad Iron.

THE Undersigned, Agents for Manufacturers, are
prepared to contract to deliver Rails of superior
quality, and of any size or pattern, to any ports of dis-
charge in the United States.

COLLINS, VOSE & CO.
74 South St.

New York, June 1, 1850.

Railroad Iron.

1,500 Tons weighing 58 lbs. per lineal yard.

500 " " 57 " "

500 " " 56 " "

500 " " 60 & 61 lbs. "

Also 2½ ft flat rails. All the above being of approv-
ed patterns. For sale by

DAVIS, BROOKS, & CO.,
68 Broad street.

N.B.—Rails imported on commission, or at a fixed
price.

Iron.

Pig Iron, Anthracite and Charcoal; Boiler and Flue
Iron, Spring and Blistered Steel, Nail Rods, Best Re-
fined Bar Iron, Railroad Iron, Car Axles, Nails, Stove
Castings, Cast Iron Pipes of all sizes, Railway Casts
of approved patterns for sale by
COLEMAN, KELTON & CAMPBELL,
109 N. Water St., Philadelphia.

IRONDALE PIG METAL, MANUFACTURED
and for sale by the Bloomsburg Railroad Iron Co.
LINDLEY FISHER, Treasurer.
75 N. Water St., Philadelphia.

Railroad Iron.

2000 Tons, weighing 58 pounds per lineal yard,
of the most approved pattern of T rails, in
store and to arrive, for sale by

COLLINS, VOSE & CO.,
74 South St.

New York, June 1, 1850.

Railroad Iron.

1675 Tons, weighing about 61 lbs. per yard, 90
tons, weighing about 52 lbs. per yard, and
825 tons, weighing about 53½ lbs. per yard, of the lat-
est and most approved patterns of T rail, for sale by
BOORMAN, JOHNSTON & CO.,
119 Greenwich street.

New York, Feb. 25, 1850.

N.B.—B., J. & Co are also prepared to take con-
tracts for English rails, delivered in any of the Atlan-
tic ports of the United States.

Railroad Iron.

THE UNDERSIGNED, HAVING made arrange-
ments abroad, are prepared to contract for the de-
livery of Foreign rails, of approved brands upon the
most favorable terms.

They will also make contracts for American rails,
made at their Trenton works, from Andover Iron, in
whole or in part, as may be agreed upon.

They are prepared to furnish Telegraph, Spring and
Market Wire; Braziers and Wire Rods; Rivets and
Merchant Bars to order, all made exclusively from An-
dover Iron. The attention of parties who require Iron
of the very best quality for special purposes, is respect-
fully invited.

COOPER & HEWITT,
17 Burling Slip, New York.

February 15, 1850.

Glendon Refined Iron.

Round Iron, Band Iron, Hoop Iron,
Square " Flat " Scroll "

Axles, Locomotive Tyres,
Manufactured at the Glendon Mills, East Boston, for
sale by **GEORGE GARDNER & CO.,**
5 Liberty Square, Boston, Mass.

Sept. 15, 1849.

3m37

**PATENT HAMMERED RAILROAD, SHIP &
BOAT SPIKES.**—The Albany Iron Works
have always on hand, of their own manufacture, a
large assortment of Railroad, Ship and Boat Spikes
from 2 to 12 inches in length, and of any form of head.
From the excellence of the material always used in
their manufacture, and their very general use for rail-
roads and other purposes in this country, the manu-
facturers have no hesitation in warranting them fully
equal to the best spikes in market, both as to quality
and appearance. All orders addressed to the subscrib-
ers at the works will be promptly executed.

JOHN F. WINSLOW, Agent.

Albany Iron and Nail Works, Troy, N. Y.
The above Spikes may be had at fact prices, at
Erastus Corning & Co Albany; Merritt & Co., New
York; E. Pratt & Brother, Baltimore Md

LAP—WELDED WROUGHT IRON TUBES

FOR

TUBULAR BOILERS,
FROM ONE AND A QUARTER TO SEVEN
INCHES IN DIAMETER.

THE ONLY Tubes of the same quality and man-
ufacture as those so extensively used in England,
Scotland, France and Germany, for Locomotive, Ma-
rine and other Steam Engine Boilers.

THOMAS PROSSER & SON, Patentees,
28 Platt street, New York.

Railroad Iron.

THE UNDERSIGNED ARE PREPARED TO
contract for the delivery of English Railroad Iron
of favorite brands, during the Spring. They also re-
ceive orders for the importation of Pig, Bar, Sheet, etc.
Iron.

THOMAS B. SANDS & CO.,

February 3, 1849.

73 New street,
New York.

Iron Store.

THE Subscribers, having the selling agency of the
following named Rolling Mills, viz: Norristown,
Rough and Ready, Kensington, Triadelphia, Potts-
grove and Thorndale, can supply Railroad Companies,
Merchants and others, at the wholesale mill prices for
bars of all sizes, sheets cut to order as large as 58 in.
diameter; Railroad Iron, domestic and foreign; Loco-
motive tire welded to given size; Chairs and Spikes;
Iron for shafting, locomotive and general machinery
purposes; Cast, Shear, Blister and Spring Steel; Boil-
er rivets; Copper; Pig iron, etc., etc.

MORRIS, JONES & CO.,

Iron Merchants,

Schuylkill 7th and Market Sts., Philadelphia.
August 16, 1849. 1y33

Railroad Iron.

THE MOUNT SAVAGE IRON WORKS, AL-
legany county, Maryland, having recently pass-
ed into the hands of new proprietors, are now prepar-
ed, with increased facilities, to execute orders for any
of the various patterns of Railroad Iron. Communi-
cations addressed to either of the subscribers will have
prompt attention. **J. F. WINSLOW, President**

Troy, N. Y.

ERASTUS CORNING, Albany

WARREN DELANO, Jr., N. Y.

JOHN M. FORBES, Boston.

ENOCH PRATT, Baltimore, Md.

November 6, 1848.

Railroad Iron.

THE SUBSCRIBERS ARE PREPARED TO
take orders for Railroad Iron to be made at their
Phoenix Iron Works, situated on the Schuylkill Riv-
er, near this city, and at their Safe Harbor Iron Works,
situated in Lancaster County, on the Susquehanna
river; which two establishments are now turning out
upwards of 1800 tons of finished rails per month.

Companies desirous of contracting will be promptly
supplied with rails of any required pattern, and of the
very best quality.

REEVES, BUCK & CO.

45 North Water St. Philadelphia,
March 15, 1849.

Monument Foundry.

A. & W. DENMEAD & SON,
Corner of North and Monument Sts.,—Baltimore,
HAVING THEIR

IRON FOUNDRY AND MACHINE SHOP

In complete operation, are prepared to execute faithfully and promptly, orders for Locomotive or Stationary Steam Engines, Woolen, Cotton, Flour, Rice, Sugar Grist, or Saw Mills, Slide, Hand or Chuck Lathes, Machinery for cutting all kinds of Gearing. Hydraulic, Tobacco and other Presses, Car and Locomotive patent Ring Wheels, warranted, Bridge and Mill Castings of every description, Gas and Water Pipes of all sizes, warranted, Railroad Wheels with best faggoted axle, furnished and fitted up for use, complete
Being provided with Heavy Lathes for Boring and Turning Screws, Cylinders, etc., we can furnish them of any pitch, length or pattern.
Old Machinery Renewed or Repaired—and Estimates for Work in any part of the United States furnished at short notice.
June 8, 1849.

Iron Wire.

REFINED IRON WIRE OF ALL KINDS,
Card, Reed, Cotton-flyer, Annealed, Broom, Buckle, and Spring Wire. Also all kinds of Round, Flat or Oval Wire, best adapted to various machine purposes, annealed and tempered, straightened and cut any length, manufactured and sold by
ICHABOD WASHBURN.

Worcester, Mass., May 25, 1849.

Wheel, Forge and Foundry Iron.

LOCUST GROVE Wheel Iron of great strength and superior chilling property.
Balt. Charcoal Forge Iron, from Patuxent, Curtis Creek and Gunpowder furnaces.

Elkridge Foundry Iron, of superior strength and softness. Anthracite and Charcoal Iron from Pennsylvania and Virginia. Gas and Water Pipes, Lamp Posts from Elkridge furnace.

LEMMON & GLENN,
6m9 62 Buchanan's Wharf, Baltimore.

S. S. Keyser & Co., IRON WAREHOUSE,

Corner of South and Pratt Streets,
BALTIMORE, MD.

Selling Agents for the Rough and Ready Bar Iron and Elk Boiler and Flat Iron Rolling Mills, Sarah and Taylor Furnaces, and Wrightsville Hollow Ware Foundry, and Dealers in Bar and Sheet Iron, and Cast, Sheer, German, Blister, Spring and Electroplated Steel, etc., etc.

Smith & Tyson,

GENERAL COMMISSION MERCHANTS,
No. 25 South Charles St., Baltimore, Md.

AGENTS for the Celebrated Columbia Pig Iron, suitable for Car Wheels and Chilled Rolls.
Columbia refined Charcoal Blooms; Refined Charcoal Juniata Billet Iron for Wire; Refined Iron for Bridging, of great strength; Cut Nails, Spikes, and Brads; Railroad Spikes and Wrought Chairs. 22tf

Stickney & Beatty,

DEALERS IN IRON AND IRON MANUFACTURERS.

AGENTS for the Balt. City Rolling Mill, from which establishment they are prepared to furnish Ellicott's round, square, and flat bar iron, puddled and charcoal boiler plates and billet iron—also agents for the sale of the Laurel and Maryland (Balt.) charcoal forge pig irons, Balt. hard iron for chilling wheels, anti-rust nails, Cast-iron foundry iron, boiler blooms from the Caledonian works, Wm. Jessop & Son's cast steel, Coleman's blister steel and nail rods, hoop, band, sheet, oval and common English iron.
Nos. 18 and 20 South Charles st., Baltimore.

Railroad Iron.

CONTRACTS made by the subscribers, agents for the manufacturers, for the delivery of Railway Iron, at any port in the United States, at fixed prices, and of quality tried and approved for many years, on the oldest railways in this country.

RAYMOND & FULLERTON, 45 Cliff st.

Iron.

THE SUBSCRIBERS having resumed the agency of the New-Jersey Iron Company, are prepared to execute orders for the different kinds and sizes of Iron usually made at the works of the company, and offer for sale on advantageous terms.—

150 tons No. 1 Boonton Foundry Pig Iron.
100 " No. 2 do. do. do.
300 " Nos. 2 & 3 Forge do. do.
100 " No. 2 Glendon do. do.
140 " Nos. 2 & 3 Lehigh Crane do. do.
100 " No. 1 Pompton Charcoal do.
100 " New-Jersey Blooms
50 " New-Jersey Faggoting Iron, for shafts
Best Bars, $\frac{1}{2}$ to 4 inch by $\frac{1}{2}$ to 1 inch thick.
Do do Rounds and Squares, $\frac{1}{2}$ to 3 inch.
Rounds and Squares, 3-16 to 1 inch.
Half Rounds, $\frac{1}{2}$ to 1 in. Ovals & Half Ovals $\frac{1}{2}$ to $1\frac{1}{2}$ in.
Bands, $\frac{1}{2}$ to 4 inch. Hoops, $\frac{1}{2}$ to 2 inch.
Trunk Hoops, $\frac{1}{2}$ to $1\frac{1}{2}$ in. Horse Shoe & Nut Iron.
Nail Plates. Railroad Spikes.

DUDLEY B. FULLER & Co., 139 Greenwich-st. and 85 Broad-st.

WILLIAM JESSOP & SONS' CELEBRATED CAST-STEEL.

The subscribers have on hand, and are constantly receiving from their manufactory.

PARK WORKS, SHEFFIELD,

Double Refined Cast Steel—square, flat and octagon. Best warranted Cast Steel—square, flat and octagon. Best double and single Shear Steel—warranted. Machinery Steel—round.

Best and 2d gy. Sheet Steel—for saws and other purposes.

German Steel—flat and square, "W. I. & S." "Eagle" and "Goat" stamps.

Genuine "Sykes," L Blister Steel.

Best English Blister Steel, etc., etc., etc.

All of which are offered for sale on the most favorable terms by **WM. JESSOP & SONS,**

91 John street, New York.

Also by their Agents—

Curtis & Hand, 47 Commerce street, Philadelphia.

Alex'r Fullerton & Co., 119 Milk street, Boston.

Stickney & Beatty, South Charles street, Baltimore.

May 6, 1848.

JOHNSON, CAMMELL & Co's Celebrated Cast Steel,

ENGINEERING AND MACHINE FILES, which for quality and adaptation to mechanical uses, have been proved superior to any in the United States. Every description of square, octagon, flat and round cast steel, sheet, shovel and railway spring steel, best double and single shear steel, German steel, flat and square, goat stamps, etc. Saw and file steel, and steel to order for any purposes, manufactured at their Cyclops Steel Works Sheffield.

JOHNSON, CAMMELL & Co.,
100 William St., New York.

November 23 1849.

Railroad Iron.

THE Undersigned, Agents for Manufacturers, are prepared to contract for the delivery of English, Welsh and Scotch Rails, of any pattern and weight, also for every description of English, Welsh, Scotch, and Swedish Iron, Railway Chairs and Spikes, Rivets, Bolts, Nuts, Washers, Chain Cables, Anchors, Tin Plates, German Spelter, Iron Castings, and every description of Machinery.

WILLIAM BIRD & CO.,
Iron and Tin Plate Merchants,
44 Wall st., New York.

And at 5 Martin's Lane, City, London,
and 140 Buchanan st., Glasgow.

July 27th, 1850.

To the Proprietors of Rolling Mills and Iron Works.

THE Undersigned—Proprietors of Townsend's Furnace and Machine Shop, Albany—are extensively engaged in the manufacture of Machinery and fixtures for Iron, and Copper Rolling Mills, and Iron Works. Having paid particular attention to the manufacture of *Rolls* (Rollers), both *chilled and dry-sand*, they feel confident that they can execute orders for such castings in a satisfactory manner. And to give assurance of this, they beg leave to refer to the following named persons, proprietors and managers of some of the most extensive rolling mills in the country, viz: Jno. F. Winslow, J. Tuckerman, H. Burden, W. Burr, J. & J. Rogers, Saltus & Co., J. B. Bailey, L. G. B. Cannon, Hawkins & Atwater, etc., etc.

F. & T. TOWNSEND.

Albany, August 18, 1849,

Railroad Iron.

B. O. Railway Tires, Railway Wheels,
Scotch Pig Iron, Tin Plates and Banca Tin,
Muntz's Patent Metal Sheathing,
Baltimore Copper.

Contracts for Rails made on behalf of the manufacturers, for delivery at any ports in the United States, at fixed prices.

Bowling Tires and Tire Bars and Scotch Pigs imported to order.

Muntz's Ship-sheathing, and a general stock of Tin Plates and Banca Tin in store, and for sale by
RAYMOND & FULLERTON, 45 Cliff st.

Bowling Iron. Stamped B.O.

Railway Tire Bars Rivet Iron
Locomotive and other Axles Locomotive Frame do
Boiler Plates Bars,

and every other description of this superior Iron.

The subscribers, agents for the sale of Bowling Iron, are prepared to execute orders for importation, especially for railway and machinery uses, with despatch from the manufacturers.

RAYMOND & FULLERTON, 45 Cliff st.

Lovegrove's Patent Cast Iron Water and Gas Pipes.

THE Subscriber, the Inventor and Patentee of the Centrifugal mode of giving form to metallic substances while in a molten state, is preparing to make Cast Iron Water and Gas Pipes, of any dimensions, at prices much lower than they can be made in the old manner, and the pipes warranted to stand a pressure of three hundred pounds to the square inch, and to be soft enough to drill. Steam Engines and all kinds of machinery. Cast Iron Doors and Frames, and Mill Castings of every description, made to order.

THOMAS LOVEGROVE,
Machinist and Founder,

West Falls Avenue, below Pratt st., Baltimore.

Ray's Patent India Rubber Car Springs.

Savannah, Ga., May 22, 1850.

FOWLER M. RAY, Esq.,
Dear Sir: I have no hesitation in saying, after having used on our road your springs and Fuller's, that I consider yours decidedly the best in every particular, and in this opinion I am sustained by all our officers. Fuller's spring has a tendency to split, and also to chafe or abrade by the constant friction on the cast iron plates or discs: and in my opinion is not near so elastic as yours.

Your springs, which have been in use on our road for 12 or 15 months past, and in constant use under both passenger and freight cars, are to all appearances as elastic, sound and good, as when first put in use.

We are now building eighty-five new cars, of which for fifty-sets the springs have been ordered of you.

GEORGE A. ADAMS,
Master Carpenter,
Central Railroad and Banking Co. of Georgia.

Connecticut River Railroad Office, }
Northampton, May 4, 1850. }

E. CRANE, Esq.,
Dear Sir: It is now about two years since I first tried the experiment of using a set of Ray's India-rubber Springs upon one of our merchandise cars, and although the car has been in constant service since that time, I do not on examination find the slightest difference either in the thickness or elasticity of the material.

The same result has followed wherever we have applied them, either for wheel or draw springs on Engines, Tenders or Cars. At present we use no other; either in replacing old springs or building new cars—and I am perfectly satisfied that for economy, durability, safety, and ease of motion, that Ray's India-rubber is the best article for Springs which has been presented to the public.

Yours respectfully, **J. HUNT,**
Supt. Connecticut River Railroad.

EDWARD CRANE, Esq.,
Dear Sir: Having applied to cars of the Boston and Worcester Railroad Corporation, Ray's Vulcanised Rubber Springs (where they have been in use for some two years last past), I have had occasion to observe their operation, and am free to say in answer to your inquiries, that they retain their elasticity perfectly during all changes of atmospheric temperature: and are in my opinion a most valuable acquisition to Railroad Cars—are not liable to derangement, as is the case with steel springs; while at the same time it costs less to apply them. Respectfully yours,

D. N. PICKERING,
Supt. Motive Power, Bowt. & Wor. Railroad.
Boston, April 15th, 1850.

FARMERS! ATTENTION!!

John Mayher & Co's
NEW AGRICULTURAL WAREHOUSE
AND SEED STORE.

197 WATER STREET, NEW YORK.

Where they have for Sale, the largest and most complete assortment of Farming Implements, ever offered for sale in this city—all of which they will sell 10 per cent. Cheaper than the same kind of Goods can be bought at any other house in the city. Our Goods are all Warranted to give satisfaction.

FARMERS wanting to purchase, will please call and examine our Stock before buying elsewhere.

Among our assortment may be found the Celebrated Highest Premium Eagle Ploughs! together with all the most approved Ploughs now in use.

Also,—Horse Powers, Threshing Machines, Fan Mills, Corn Shellers, Straw Cutters, Corn Mills, Seed Sowers, Churns, Ox Yokes, Ox Scrapers, Hay Rakes, Horse Rakes, Patent Chain Pump (that never freezes nor rusts), and other Pumps; in fact we have everything for Farming Purposes—together with Guano, Bone Dust and other Fertilizers.

JOHN MAYHER & CO.,
197 Water st., N. Y.

February 9, 1850.

N.B.—J. M. & Co. also continue their Old Stand, at 195 Front street, near Fulton Market.

RAILROAD CAR AND COACH TRIMMINGS.

Doremus & Nixon,
IMPORTERS AND FURNISHERS

HAVE FOR SALE

Plain Garnet Plush. Fig. Garnet Plush (Butterfly pat.
"Crimson " "Crimson " (Elegant.
"Scarlet " " " " (Gen. Taylor.

BROCATELLES.

Crimson Silk Brocates. Gold and Maroon do.
Gold and Blue " " Brown " do.
Silk and Wool " " of every color.

MOQUETTES,

Of elegant designs and colors.

GERMAN CLOTH FOR CAR LININGS.

The most beautiful goods ever shown in this country, and the subscribers are the sole agents for the sale of them.

Oil cloths Enamelled with Gold. These goods can be
Do. Silver ground velvet printed. furnished in any
dimensions req'd.

CURLED HAIR

Of every description and quality.

JNO. W. A. STRICKLAND, Agent.
New York, 1850. 1716

FOWLER M. RAY'S Patent India-rubber Railroad CAR SPRING.

New York and Erie Railroad Shops.
Piermont, March 26, 1850.

This will certify that from practical experience in the use of Fowler M. Ray's India rubber Car Springs, I believe them to be far superior to any others now in use.

I have never known them to be affected by any change of temperature, as other Rubber Springs have been affected on this road.

I am at the present time repairing a Passenger Car that Mr. Ray and myself mounted with his springs about two years and eight months since.

The springs are at the present time as perfect, to all appearances, as when first applied to the car.

Respectfully yours,

HORACE B. GARDNER,
Foreman of the Car Shops.

Supt. Office N.Y. & H. R.R., }
New York, March 8, 1850.

This is to certify that we have used the Rubber Springs manufactured by Mr. F. M. Ray for the past twenty months, "both for Passenger and Freight Car Springs and Bumpers, and of different sizes," and have in every case given entire satisfaction, and I consider them the best spring now in use.

M. SLOAT, Supt.

Boston, March 5, 1850.

In answer to your enquiry about India-rubber Springs, I have to say that we have used them to a considerable extent on both freight and passenger cars, and also on several of our tenders; and I am very well satisfied that they answer all the purposes for which they are intended. I believe the India-rubber will soon supersede all other springs for cars and tenders.

Yours truly,

S. M. FELTON,
Supt. Fitchburg Railroad.

Office New Jersey Railroad Co., }
Jersey City, March 8, 1850.

FOWLER M. RAY, Esq.,

Dear Sir: In answer to your enquiries respecting the operation of the Vulcanised Rubber Springs, purchased by our company from you some two years since, I reply that they are superior to any spring in use, (that I have either seen or heard of).

The improved form of your spring, consisting of a solid piece of vulcanised rubber with bands on the outside, is far superior to your first form, consisting of disks of rubber with metallic plates interposed.

The last named form was tried, if you recollect, at a much earlier period; and then was replaced by your last form.

I have no hesitation in saying that your springs have given entire satisfaction, and most cheerfully recommend them to railroad companies throughout the country for the following reasons:

- 1st. The cost is 30 per cent. less.
- 2d. Saving of weight on each car of 9 wheels from 700 to 800 lbs.
- 3d. Less care and attention is required, as they are not liable to get out of repair.
- 4th. A great saving is secured in the wear and tear of the cars and rails from their great elasticity.
- 5th. The freedom from noise.
- 6th. There is greater safety in case of accident, as they cannot be broken.
- 7th. The comfort of passengers is enhanced sufficiently to pay the expense, waiving all the other reasons that I have given.

Should this fail to satisfy any person enquiring, you are at liberty to refer to me, No. 150 Washington St., Jersey City.

Yours respectfully,

T. L. SMITH, Supt.

New York, March 11, 1850.

I have used the Patent India-rubber Spring purchased of Mr. Ray, upon the cars of the New York and New Haven Railroad, and have found them efficient and economical; and when applied to the axles and draw springs, believe them to be quite equal to any in use. I have found a combination of these springs with a steel spring under the transom beam a very satisfactory arrangement, and am now using this plan in all new cars.

Yours respectfully,

ROBERT SCHUYLER.

February 25, 1850.

From practical observation of the use of the India-rubber Car Springs, manufactured and sold by your company, we are entirely satisfied in their application, and do not hesitate to recommend them as elastic, durable, requiring no repairs for years, and retaining their consistency during all extremes of weather. We have applied them for the past two years, and consider them superior for all railroad purposes.

Yours truly,

OSGOOD BRADLEY, Car Builder, Worcester.
T. & G. WASON, do. Springfield.
DEAN, PACKARD & MILLS, do. do.
DAVENPORT & BRIDGES, do. Cambridgeport.

Office of the New Jersey Railroad Co., }
Jersey City, March 7, 1850.

This is to certify that we have had Mr. F. M. Ray's India-rubber Springs in constant use under our cars, and as Bumper Springs for upwards of two years, and they have in every way given perfect satisfaction.

The present form of spring we deem far superior to the form of Disk, having used both forms, although we have none of those made in Disks at present in use.

We take pleasure in recommending these springs to all railroad companies.

J. P. JACKSON, Vice Prest.

New Jersey Railroad and Trans. Co.

Roxbury, February 28, 1850.

In compliance with your request, I take great pleasure in stating the result of my experience in the use of "Ray's Patented Vulcanised India-rubber Car and Engine Springs." We have used them nearly two years, and never had one fail in any way. The cold weather does not affect them, as it has other rubber springs we have used.

With sixteen years' experience as superintendent of machinery on the Boston and Providence railroad, I take pleasure in saying that your springs are the best we ever used, or I ever saw used elsewhere. We have 20 cars rigged with them, of which I can say that the springs are as good now as when first applied. I put 24 lbs. of the rubber under the forward end of one of our heaviest engines, taking off 250 lbs. of steel springs—it has been in use 18 months, and is in as good condition now as when first put under the engine.

Very respectfully yours,

GEO. S. GRIGGS,
Supt. of Machinery, Boston and Prov. R.R.

Fall River, February 2, 1850.

In answer to yours of the 20th ult. I would say that this company has for some 10 or 12 months past been using "Ray's India-rubber Springs." We have applied them to both passenger and freight cars with uniform success. They have invariably preserved their elasticity and consistency through all the extremes of weather; and we are now applying them whenever the steel spring fails. I am well satisfied that they are particularly adapted for railroad purposes.

Very respectfully yours,

GEO. HAVEN,
Supt. Fall River Railroad.

Jersey City, March 9, 1850.

This is to certify that the present form of Mr. F. M. Ray's India-rubber Car Spring I consider far superior to the form of Disk, having used both forms.

I take pleasure in recommending these springs to all railroad companies.

DAVID H. BAKER,
Foreman of Car Shop of N.J. R.R. & Trans. Co.

Harlem R.R. Depot, }
New York, March 7, 1850.

This is to certify that the present form of Mr. F. M. Ray's India-rubber Springs for over eighteen months, and find them to be easy and durable, and recommend them to railroad companies as being superior to anything we have tried.

J. M. SMART,

Foreman at 42d St. Depot.

Old Colony Railroad Office,
Boston, March 6, 1850.

EDWARD CRANE, Esq.,

President New England Car Co.,

Dear Sir: In compliance with your request I would state that the Old Colony Railroad Compy have had in use upon their road, India-rubber Springs furnished by your company, for more than eighteen months past, during which time they have been extensively used under Passenger and Freight Cars, Locomotive Tenders, and for Drawer and Buffering Springs, with the most perfect success. The elasticity and consistency of the Rubber has never been unfavorably affected by either extremes of heat or cold—and from the experience which we have had in the use of Rubber Springs, I think them well adapted for railroad purposes—and therefore we have for some months past used Rubber almost exclusively, in all places where springs are required.

Respectfully yours, etc.,

JAS. H. MOORE,
Supt. O. C. Road.

Troy, February 27, 1850.

We have been using your India-rubber Car Springs for nearly two years—and we take pleasure in saying that in our opinion the rubber has to a certain extent already, and may eventually entirely supersede all other Springs for Railroad Car purposes. We now use it entirely for Draw Springs and Bumpers, considering it better and lighter than steel.

During our two years' experience in the use of it, we have not known any to lose their elasticity, or fail in any way; and we cheerfully recommend the rubber for railroad car springs.

Very respectfully,

EATON, GILBERT & CO.

Passenger Car Linings.

THE Advertiser continues to make to order the Enamelled Car Linings which have been so highly approved the last three years, and are now exclusively used by all the Northern Railroads. No pains are spared to get out new styles, and adapt them to the tastes of every consumer.

Orders addressed to **CHARLES STODDER, No. 75 Kilby street, Boston,** will have prompt attention.
March 23, 1850. 2m

India-rubber for Railroad Cos.

RUBBER SPRINGS—Bearing and Buffer—Fowler's Patent—Hose from 1 to 12 inches diameter. Suction Hose. Steam Packing—from 1-16 to 2 in. thick. Rubber and Gutta Percha Bands. These articles are all warranted to give satisfaction, made under Tyer & Helm's patent, issued January, 1849.—No lead used in the composition. Will stand much higher heat than that called "Goodyear's," and is in all respects better than any in use. Proprietors of railroads do not be overcharged by pretenders.

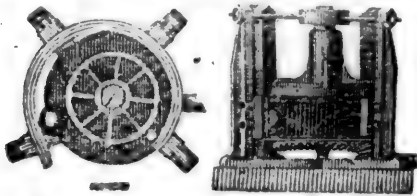
HORACE H. DAY,

Warehouse 23 Courtlandt street.

New York, May 21, 1849.

Spikes, Spikes, Spikes.

ANY person wishing a simple and effective Spike Machine, or a number of them, may be supplied by addressing
J. W. FLACK,
Troy, N. Y.
March 6, 1850.

MACHINERY.**Henry Burden's Patent Revolving Shingling Machine.**

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This machine is now in successful operation in ten or twelve iron works in and about the vicinity of Pittsburgh, also at Phoenixville and Reading, Pa., Covington Iron Works, Md., Troy Rolling Mills, and Troy Iron and Nail Factory, Troy, N. Y., where it has given universal satisfaction.

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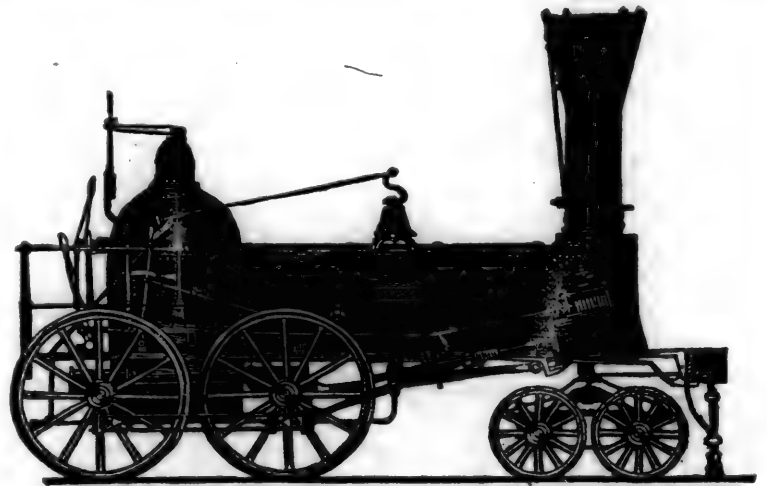
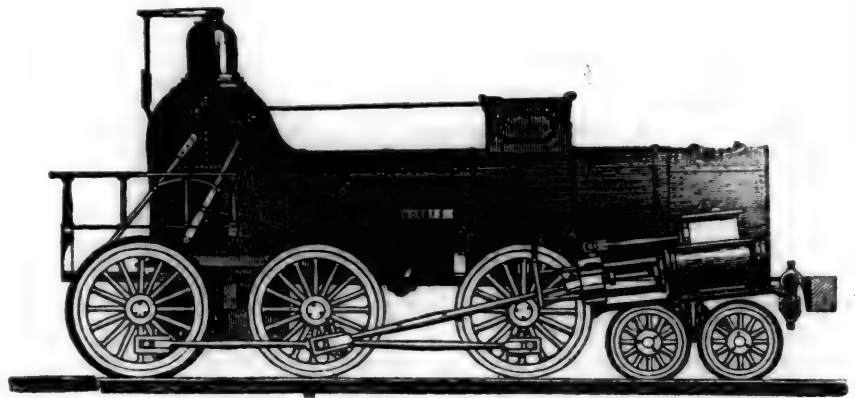
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November 3, 1849.

1y

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AMERICAN RAILROAD JOURNAL.

STEAM NAVIGATION, COMMERCE, MINING, MANUFACTURES.

HENRY V. POOR, Editor.

ESTABLISHED 1831.

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SATURDAY, AUGUST 31, 1850

[WHOLE No. 750, VOL. XXIII.]

ASSISTANT EDITORS,

J. T. HODGE, *For Mining and Metallurgy.*

GEN. CHAS. T. JAMES, *For Manufactures and the Mechanic Arts.*

M. BUTT HEWSON, C. E., *For Civil Engineering.*

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American Railroad Journal.

PUBLISHED BY J. H. SCHULTZ & Co., 136 NASSAU ST.

Saturday, August 31, 1850.

American Iron Manufacture.

MEMORIAL.

To the Senate and House of Representatives of the United States of America, in Congress assembled:

Continued from page 523.

To whom, then, enures the advantages of cheap foreign iron? Abundance of food is no more beneficial to a man in the agonies of a fatal disorder, than cheap iron to a paralyzed industry. The ability of the country to consume iron depends on the vigor and activity of all departments of industry. If agriculture languishes, the consumption of iron is diminished; if the machinery of the north is idle, or partially so, the demand for iron falls off, and so if cotton or sugar are selling at inadequate rates.

At the present moment various interests are suffering from the utter stagnation of the iron trade, as the operatives in iron will this year, 1849, consume in supply of their wants some twelve millions of dollars less than in 1847. This alone is enough to carry serious injury into numberless channels of industry. It especially affects the consumption of

cottons and woollens; for the use of these can be abridged to a greater extent than food. All interests are, therefore, bound together by common ties; when one suffers all suffer. It is a great mistake to suppose that the producers of cotton, sugar, rice and tobacco, have no special interests in the activity of manufacturing industry in the other states. A very large proportion of the cotton crop is now consumed in the U. States, and thus kept from the British market, already so liberally supplied as to give British merchants control of the price. When British iron is exported to us for want of a market at home, we take it at our own price; when we order large quantities of iron we pay what they can exact. Our cotton is mainly exported, disgorged upon the British market, and the price is made in Liverpool. When British manufacturers shall be compelled to come hither for their cotton, the price will be made by the planters. The present supply is so large, that the price is yearly the result of mere speculation. What is sold in this country is clear gain to the planter, as the whole crop would sell for no more in Great Britain than the quantity which now goes there. If half the crop was consumed at home the other half would sell for as much in Great Britain as is realized for the quantity now exported. This result is not only attainable under favoring legislation—but it might have been attained before now, by that wise policy which stimulates home industry to its utmost capacities. By such a policy the consumption of cotton and iron could be doubled in a few years, with immense advantage to the wealth and happiness of our whole population. It is the interest of the planter not to struggle for that division of labor among nations; which makes one nation a planter of cotton; another of sugar; another a maker of iron; another a spinner; another a weaver; another a tailor; and so on: but that division of labor which mingles these pursuits in the same country, in the same county, in the same town, and, to some extent, on the same plantation. This is the division of labor which begets a vast production and consumption at home, and an internal trade with which no foreign commerce can ever vie.

Who can doubt, that if the planting states were legislating for themselves, their first care would not be to become more independent, to diversify their labor and vary its products?—What such legislation would compel them to do, they can now do under that national legislation which is invoked by others. They are already entering upon that career—it will be found not only the sure road to prosperity for them, but also for us. We so fully confide in the doctrine of the division of labor at home, that we not only trust the cotton planters will manufacture as much of their cotton at home as they can, and feed the operatives thus employed, but also manufacture as much of their iron as they can. There is room for all, work for all, and market at home for such a large portion of our products that the remainder will not overcharge the

channels of foreign commerce and be sacrificed for the advantage of foreign merchants and manufacturers.

We object to the doctrine that industrial pursuits are subordinate to foreign commerce; and that the latter is to be considered as the rightful patron of industry. In our view, industry stands first in natural order, and should be the first care of the legislator. Commerce is merely an agency, the charges of which, as well as its powers, should be kept to the lowest point consistent with efficiency. It may suit those engaged in commerce to insist upon the "Let us alone policy," for doubtless merchants can take care of themselves, and thrive not the less, when the producers, from whom their profits come, are suffering most. The manufacturer has, in all countries, asked for special legislation, and under its good effects the present manufacturing systems of Europe and this country have grown to their present magnitude. The relative importance of the domestic production of this country and its foreign commerce, may be seen in the fact that our foreign commerce yields from six to eight dollars worth of foreign commodities to the consumption of each individual of our population; whilst the domestic industry of the country furnishes not less than from 75 to 100 dollars for each person. Shall we pursue a policy impairing the power that produces the larger supply, in the vain attempt to add the worth of a dollar or two a head to the quantity of foreign commodities consumed?—And be it noted, that every dollar a head added to our consumption of foreign goods adds over 21,000,000 dollars to our imports.

If an ample supply of iron be indispensable to national progress and national welfare, and if the whole of that supply cannot be imported as cheaply as it can be made at home, the principle which should govern legislation applied to this industry and to others in like circumstances, is clearly discernable. If home production, on which we rely for more than three-fourths of our consumption, is not sustained in that activity which ensures its proceeding with economy and advantage, it must flag; and the product being diminished, a greater demand must be thrown upon the foreign market, enhancing the prices of importation. But if the home production is adequately sustained by a free market, it can supply all the channels of consumption. Legislation, making closely the line of vigorous production at home, will encourage importation, with the double purpose of obtaining revenue and keeping the manufacturers at home to fair prices.

Sustain the domestic manufacturer at the point of full production, and then admit the foreign article freely. The more closely our revenue enactments approximate this object, the more perfectly will they encourage domestic industry, obtain the largest attainable revenue, and best secure the interests of consumers. The manufacturer, constantly struggling to keep up his prices, will be as con-

stantly met by foreign iron, selling at such rates as to keep him to the line of public advantage. It is the operation of a well managed competition between the domestic and foreign producer, which results in the greatest benefit to the consumer. If the consumer is driven to a foreign market for his supplies, or for too large a proportion of them, prices will be inordinately advanced against him; while, if the foreign market is prohibited, or too heavily burdened, the same undue advance may take place at home. But if foreign iron is introduced at the point designated, it not only works no injury, but produces positive public good, as to revenue and prices, and also as to the increased consumption of iron. There are certain average rates, at which manufacturers of iron in this country can live and flourish, and these rates are very little, if any, above those to which the often-recurring fluctuations of prices in Great Britain are carried. At these rates, which are easily ascertained by the legislator, the line of competition can be established with the greatest advantage to the consumer. They will not exclude foreign iron; but frequently attract it. During the last fiscal year, the very large importation of 315,000 tons of iron has taken place. Of this, much the larger proportion has probably been sent to us on foreign account, because there was no demand at home; it was sent to save the home market, already broken down, from further depression. It has broken down our markets; and, if sold at present rates, will not yield the makers a penny of profit. The iron, coming thus to a bad market, came because it would have been worse for the holders to keep it at home. If previous legislation had shielded our market so as to maintain prices remunerating to our manufacturers, the additional duty necessary for this purpose would not have deterred the export of iron to this country; for, while those who shipped it to our ports must have paid a higher duty, they would have realized better prices. A ton of iron rails, under the present tariff, at the prices prevailing in 1846 and 1847, was charged with a duty of twenty dollars, which was almost prohibitory, and therefore produced little revenue, making foreign rails cost 90 dollars per ton. During the year 1849, a ton of rails has been charged with only eight dollars, and has, of course, produced but little revenue; whilst a ton of rails were laid down in our market at 45 dollars, injuring the domestic producer to an extent that is incalculable. A system of revenue which would meet the low prices by a proportionate increase of duty, and make provision for high rates by a like reduction, never excluding the foreign iron, would, we believe, meet the exigencies of domestic industry, and greatly increase the revenue. Whatever may be the advantages of the *ad valorem* system in other cases, they are more than neutralized by the fluctuations of the prices of British iron. It is true that a part of this objection applies with equal force to specific duties; for, when these are high enough to meet the difficulty of low prices, they become prohibitory when prices rise. These considerations furnish a strong inducement for special provisions in our revenue system in regard to foreign iron. A system could thus be devised which would give a mighty impetus to the production and consumption of iron, and to other dependant branches of industry. A home competition could be thus ensured, which would, in the end, reduce the price of iron to the lowest limits consistent with undiminished production. Under such a policy, we should soon surpass Great Britain in the quantity of iron made and consumed, as much as we do now in the quality. We should employ hosts of laborers, and attract them hither from all quarters of the world; and for every million of people which this scene of industry would draw to our shores, we should be furnished with an additional home market, equivalent in amount, and far more remunerative, than the average export of our foreign trade.

In closing this memorial, we ask your intervention in our favor, and the insertion of such provisions in our revenue laws as will "regulate commerce with foreign nations" in iron, and exclude from our markets the results of those destructive fluctuations and irregularities which originate in foreign causes, and should expend their force on foreign shores. This being done, we only ask further that such duties be imposed upon foreign iron

as will bring the largest revenue to the public Treasury.

Oxygen.

In the articles, "Curiosities of the application of Sand, vol. i. p. 12, "Lime," vol. p. 207, and "Alumina the Earth of Clay," vol. iii. p. 33, we have endeavored in a popular manner, to point out the leading properties of the most useful and most abundant of those compound substances which make up the greatest part of the earth's crust.

We now purpose extending the series by a few papers on some of the elementary or simple bodies, which not only perform a most important part in the formation of the compound substances, the earths already noticed, but equally pervade the whole of inorganic nature, and reappear in still greater activity in the organic world of life.*

Oxygen, from its activity and universality in nature, and from its being so pre-eminently the connecting link between the earth and her children, lays first claim to our attention, and the remainder of this paper will be devoted to the consideration of its properties, and to the history of its discovery, and the circumstances closely connected with it. Oxygen, when prepared with the greatest care, is an insipid and colorless gas, which remains elastic under the greatest pressure and the most intense cold. Its specific gravity is 1.11; that is, in equal bulks, it will weigh nearly one-ninth more than common air. It is called an elementary or simple substance, because all the skill of the analyst fails to extract any matter differing from itself. It is said, therefore, to resist decomposition, and the terms elementary or simple are used in contradistinction to compound, which signifies a liability to chemical decomposition—i. e., a resolution or separation into ultimate component parts.†

The importance of this element—oxygen—may be estimated by considering the numberless instances of its presence and abundance. Of silica it forms one-half. Here we have a striking example of the vastness of its quantity, and the universality of its presence. Granite, which appears to be the foundation rock of the earth, is nearly pure silica; and we need not remind the reader of our previous article on sand, of many other instances of its presence and value. Next to sand we value lime, and in limestone nearly one-half (24-50ths) is oxygen. In clay, more than half is oxygen; and if we were to measure the rocks of the earth, and deduct the amount of sand, lime and clay—or rather of silica, lime and alumina—how small a portion would remain; we think less than one-twentieth part of the whole, and oxygen would still have a large share in the remainder. Of the rarer earths, magnesia, barytes, strontia, glucina, &c., it forms a part.‡ The metals, well known as they are, form but a very small portion of the soil, yet they are all usually found as oxides, containing from about one twenty-seventh to two-thirds of their weight of oxygen. By far the most generally distributed metal is iron, and it is commonly found as an oxide, containing more than one-third of oxygen. Leave the

* *Inorganic.*—The constituents of the earth, as rocks, stones, minerals, water, air, &c. *Organic.*—The compounds formed by the action of the principle of life, both animal and vegetable. Organic bodies are always compounds; inorganic bodies may be either elementary or compound.

† We use the word *matter* advisedly. Latent heat, electricity, and, very possibly, light, if not combined with, are at least very intimately associated with, every so-called element. We regret that the present state of popular science is such as to compel us use more ambiguous language than we could wish, though we hope it is sufficiently plain to set some of our readers thinking for themselves. As we are constitutionally opposed to mere speculative philosophy, we must at the outset warn against the assumption of any hints as proven facts; and though we shall be very glad to have any one's deliberate opinions, whether in accordance with or opposed to our own, yet we feel quite warranted by our experience to say, we must decline any controversy or disputation, as being more calculated to beget strength of opposition, rather than a just appreciation of truth.

‡ The proof of this is due to Sir Humphrey Davy, born 1778, died 1829.

dry land and return to the sea. Oxygen forms eight-ninths of water. Mount the air—one-fifth is oxygen. Thus, in the whole domain of inorganic nature, we see the importance of oxygen; and so great is its activity in combination, that it unites with all the known elements, save one (fluorine), directly, and with that one indirectly. Of six hundred and fourteen references in Berzelius' celebrated treatise on the blowpipe, twenty-nine are to minerals without oxygen, and this only when the exceptions are in a state of absolute purity; a circumstance which, in the ordinary course of events, would not occur once in twenty-nine times six hundred and fourteen instances. Absolute purity is seldom attained even by the most elaborate applications of art, more rarely by the unaided efforts of nature; and thus, though regarded as accidental, yet oxygen exists in many, if not in all, of the so-called exceptions in the natural state.

Having thus traced oxygen throughout the inorganic world, it remains to show its importance to the organic; but we must content ourselves with a mere allusion to its activity in the compounds pertaining to vitality, reserving a more extended enumeration of its services in this particular, until, in our future essays, we can consider the compounds themselves. Beginning with the link between stone and vegetable—coal, we find it present in quantities varying from three to thirty per cent.—In wood—i. e. the basic or solid part of all plants—and in flesh, it is equally abundant, and even more essential, and it is absolutely necessary for the due performance of the highly important function of respiration.

The industrial arts are greatly indebted to its services. Metals are extracted from their ores by its withdrawal, and, on the other hand, the colors of the painter and the dyer are frequently due to its addition. With lead it forms litharge and red lead; with iron, crocus. Indigo, partially deprived of it, becomes soluble and colorless, penetrates the finest tissues, then re-absorbs it, becomes brilliant and permanently fixed. Bleaching is often effected by its assistance, and vinegar-making is entirely dependent upon it. Sulphuric and nitric acids are the results of its combinations with sulphur and nitrogen, and through these two acids it is introduced into countless operations of manufacture.—We have intentionally delayed until now any mention of its most important duty—its activity in ordinary combustion; and it must be remembered that respiration causes the combustion of the principal portion of our food. The atmosphere is the source whence our fires derive their supplies, and to withhold it is to extinguish them.

In combustion, oxygen unites with the burning body, and at the same time heat is always, and light often, most freely evolved. A body, therefore, is not annihilated by burning, but its constituent principles are liberated entirely, or form fresh combinations with oxygen, and thus every substance acquires weight by combustion, the increase of weight being exactly that of the oxygen absorbed.

The product of combustion may be a gas, as when charcoal is burnt, and forms carbonic acid gas; a liquid, as when hydrogen is burnt, and forms water; or a solid, as when zinc is burnt, and forms an oxide or calx. Hence, oxygen has been termed "the supporter of combustion." This is not quite appropriate, though of ordinary combustion it appears to be true. We will, however, mention two of many exceptions: hydrogen and most of the metals burn with chlorine and with sulphur, oxy-

* We say *appears*, because the modern material atomic theory scarcely admits of the presence or action of the substance, force or property—heat—as an *essential*; and if, at some future day, heat, or some analogous principle, should be shown or be supposed to have a positive and individual existence, then, as heat is present in every case of combustion, the modern theory may be upset, oxygen discarded from the list of active agents, and heat, or its relation be substituted in its place. We say this, not from any desire to render a rough road still more toilsome but to remind the reader that many modern chemical theories—i. e. hypothetical explanations of chemical phenomena—are merely guesses at truth. They may be, and we think frequently are correct, but we must warn against their too ready reception as absolute demonstrations.

gen being entirely absent. Besides, we cannot strictly apply the term "supporter of combustion" to one body only. A jet of hydrogen appears to burn in an atmosphere of oxygen, but equally the same effect results from an ignited jet of oxygen in an atmosphere of hydrogen. In the patent smoke consuming furnace of Mr. Charles Wye Williams, iron pipes, perforated with numerous holes, admit jets of common air—and consequently oxygen—into the heated smoke. On looking into the flue, it would seem that jets of inflammable gas from the various holes and burning in air, whilst the fact is the reverse—jets of air are issuing into the gas of the smoke, and which is to be called "the supporter of combustion" we are unable to decide, for both are equally active; it reminds us of the negro's pair of dogs—"Massa! 'um dogs 'dential like—specially Pompey." The peculiarity of the position has been illustrated as follows:—Could we live in an atmosphere of coal gas, and have gas pipes supplied with oxygen, each jet would afford a flame as brilliant as now, and we should say, oxygen was burnt, and coal gas supported combustion; whereas we now say just the reverse. Tho' oxygen cannot lay an exclusive claim to the honors of the phenomena of combustion, yet it possesses many very remarkable properties, which are strikingly exemplified when the gas is pure. A candle with a long snuff being extinguished, and immediately plunged into a jar of oxygen, is instantly reignited, and burns with far greater brilliancy and rapidity. A piece of glowing charcoal, immersed in an atmospheric oxygen, burns in a most brilliant manner, giving off showers of most splendid sparks; and if attached to the end of an iron wire, or, still better, a piece of steel watch spring, the metal also becomes ignited, and burns even more rapidly than a pine match in common air. The most vivid light, though the most transient, is produced by the combustion of phosphorus. The result of these combustions is in every case an oxide; this term being used in its general sense, as applied to all bodies combined with oxygen. Charcoal, burnt in oxygen, combines with it to form an oxide, which is also a gas at ordinary temperatures and pressures, and is well known as carbonic acid gas. Iron, in the same circumstances, yields an oxide of iron, resembling that formed on hot iron in the open air—smith's scales. It will be noticed, that in these instances one product is called an acid, and the other an oxide; both are compounds of oxygen with other substances, and therefore, in a general sense, are both oxides; but the terms in scientific language are employed with a view to mark the leading peculiarity of the products, bodies called in technical phraseology—acid, possessing certain distinctive properties from those to which the term oxide is arbitrarily confined. It will thus be evident that all oxides are not acids, but the reverse was at one time the generally admitted theory; and hence the name oxygen, derived by Lavoisier, the French chemist, from two Greek words, signifying "acid maker," for he held that all acids were oxides. It has since been shown that there are true acids without oxygen, the most generally known being hydrochloric acid, a name synonymous with muriatic acid, marine acid, and spirits of salt. But we are no sooner clear of one theoretical difficulty than we fall into another; for it has subsequently been urged, that as there are true acids in which hydrogen and not oxygen is present, and as none of the so-called oxygen acids exhibit their acid properties in the absence of water—a compound of hydrogen and oxygen—therefore, there is no real acid without hydrogen, and it should be called "acid maker." In short—or very nearly—that oxygen and hydrogen should change names. "Who should decide when doctors disagree?" we shall therefore leave this very pretty quarrel as it stands.* This controversy is a very good illustration of one of the many difficulties attending a speculative theory. Many are the dan-

gers incident upon a theory which cannot accept a fact as a fact, but must weave some fine-strained web of special pleading, in the vain hope of controlling these stubborn realities. To many it may now appear to be out of date, if we advocate a strict regard to experiment. The superficial observer may consider he has sufficient guarantee against hypothetical perversion, in the respect paid to the memory of Lord Bacon, the founder of experimental philosophy, and in the fashionable pursuit of *soi-disant* practical science. But let us illustrate our meaning by an example: The doctrine of chemical equivalents, or proportionally combining weights, appears to be as clearly demonstrated as the present state of science will admit; but who can point to one fact that proves the existence of atoms? *i. e.* little indivisible, unalterable, unchangeable lumps! yet active everywhere but in themselves, for in their own diminutive bodies they are impenetrable, and possess nearly every negative quality. We should not call a Maypole an active agent, merely because it was surrounded by a troop of dancers; we should say that the dancing was owing to the actors, and not to the Maypole. We should also say that they could choose their own steps and figures, and that the nature of the dance would in no way depend upon the nature of the pole, or centre of attraction. And further, that if anything was really requisite to limit their movements, it might with equal reason be external or internal; they might discard the pole, and confine themselves within the circumscribing walls of a room, or amidst the intervals of other circles—like the bubbles of foam—as well as round a solid centre or atom. So with matter. If it is composed of small solid centres—Maypoles—possessing all their powers and forces of gravity, electricity, repulsion, attraction, &c., the dancers around them, in what do they differ from our fanciful suggestion? And when we consider the difficulties of the atomic theory, respecting, light, heat and electricity—difficulties, many of which are beautifully set forth and illustrated by facts in Faraday's speculation touching electric conduction and the nature of matter—*Practical Mechanics' Magazine*, vol. iii. page 197—may we not think this guess to be even nearer the truth? a guess which supposes the dance to rest with the dancers, and not with the stick in the centre. But it is impossible to exercise too much caution in adopting a theory upon the most plausible supposition—true it is that

"Dangers past all calculation,
Beset the man of speculation;
Who, to possess an easy mind,
Should be half deaf and nearly blind."

To be continued.

Institution of Mechanical Engineers.

May 14, 1850. William Cubitt, Esq., President, in the chair.

"On the Construction of the Permanent Way of Railways, with an account of the wrought iron permanent way, laid down on the main line of the N. Midland railway," by Mr. W. H. Barlow.

The author commenced by entering into the question of the maintenance and renewal of the ordinary railways, analysing very minutely the expenses under the different heads, and showing to what causes the derangement of the line might be attributed. The cost of maintenance was stated to be dependent on two causes—the effect of weather, etc., and the disturbance produced by traffic; and from a summary of the expenditure of the different lines belonging to the Midland company, it appeared that the former amounted to £20 or £30 per mile per annum, and the latter varied from 2d. to 2s. 7d. per train per mile. After a line was consolidated, by far the greater part of this expenditure was due to the derangement caused by the passage of the trains, which first produced an uneven joint, then loosened the joint key, and then disturbed the sleeper, so that at length the whole of the permanent way generally was degraded.

With regard to renewal, it had been estimated by the officers of the London and Northwestern railway, that, on their line, the rails would last 20 years, and the sleepers, if "creosoted," 20 years, but if unprepared, only 12 years. Now, as the duration of service of the rails was dependent on the amount of the traffic, and that of the sleepers on the weather, it was quite evident that, on lines hav-

ing less traffic than the London and Northwestern, the proportionate expense of renewing the sleepers would be much greater, and would increase as the amount of traffic diminished.

In endeavoring to seek a remedy for this, the author conceived, that, by increasing the dimensions of the bridge rail, sufficient width might be obtained for it to take its own bearing in the ballast, without the use of either transverse sleepers, or longitudinal supports; and, moreover, that such a construction would possess great strength, be very durable, and be capable of being renewed at a moderate expense. He therefore proposed a bridge rail, 13 inches in width, 5½ inches in depth, and weighing 126 lbs. per lineal yard. There was some difficulty at first in getting it manufactured, but Messrs. Bolekow & Vaughan, of Middlesbrough-on-Tees, had overcome all the practical difficulties, and now produced rails of the required size, with hard metal in the upper portion, and ductile metal in the lower, by which both durability and strength were insured. The joint was made by either a cast or wrought iron chair, or saddle, which received the ends of the rails, and into which they were keyed with wooden keys. The gauge was preserved by means of a tie bar, fitted and keyed into sockets on the chairs.

An experimental length of road on this construction had been laid down on the main line of the North Midland railway, the cost of which was £3,323 per mile; but it was thought that in future this might be reduced to £2,487 per mile, by reducing the weight of the rails to 100 lbs. per yard, and the chairs in proportion, as it was found by experiment that these rails were greatly in excess of strength, being as much as three times stronger than that of the ordinary double headed rail.

A mile of road had also been laid upon the same line, with cast iron sleepers adapted to the ordinary rail, as introduced by Mr. P. W. Barlow, M. Inst. C. E.; and another mile had been laid with these cast iron sleepers at the joints only, but having intermediate sleepers of timber.

The motion of the trains over their several experimental lines was firm and steady, there being no perceptible difference between the two latter descriptions.

In the discussion which ensued, in which Messrs. Hawkshaw, Brunel, Locke, M.P., P. W. and W. H. Barlow, and Glynn, took part, the relative advantages and disadvantages of the different systems of permanent way in present use were discussed, and also, in some slight degree, compared with that proposed by W. H. Barlow; but it appeared to be a general opinion, that no one system of laying a permanent road could at present claim a great superiority over any other; and that, in reality, much more depended on the good quality of the materials used in its construction, than in any particular way of laying it. The objects to be attained were—simplicity of construction, so that there should be as few parts as possible to get out of order, a perfect joint, and economy of maintenance; and tho' the two first of these desiderata were admitted to be obtained in a permanent way with bridge shaped rails and longitudinal timber sleepers, it was contended that they were, to some extent, counterbalanced in a road laid in the ordinary manner, with double headed rails and cast iron chairs, as, in some instances, after being turned, the second table was found to be more durable than the first.

Public Schools in Maine.

During the last three years 4467 teachers have attended one or more of the institutes. The whole number of teachers employed in the State in the year ending April 1st, 1850, was 5989. The returns, however, are thought to embrace but seven-eighths of the whole. The average rate of wages for male teachers was \$16 66 a month; females \$1 46 per week. The number of school districts returned was 3350. Number of school houses 3063. The whole number of persons between four and twenty-one years, in the districts returned, was 194,005; number attending school in summer 110,009; in winter 133,413. Amount of money raised by tax for the support of public schools in 1849 in the 321 towns and plantations making returns,

* Anhydrous, *i. e.* perfectly dry sulphuric acid, by fusion with caustic alkalis, forms sulphates; so does silicic acid form silicates; both being examples of the acid action of bodies containing no hydrogen, they have been held to prove the activity of pure oxygen acids; all going to prove the old legal axiom, "that a great deal may be said on both sides."

\$221,923 55, being \$52,384 23 more than the lowest sum required by law.

Connecticut.

Norwich and Worcester Railroad.—At the recent annual meeting of this company, the following gentlemen were chosen directors viz:

Joel W. White, president; Alex. DeWitt, Wm. A. White, Elihu Townsend, David A. Neal, Jedediah Huntington, J. Newton Perkins, J. A. Rockwell, and Charles Johnson.

Ohio.

Jeffersonville and Columbus Railroad.—We are pleased to learn that this company is in a prosperous condition, and that the road bids fair to an early and successful completion. The cars are now running on the road. The whole route is under contract, and a number of hands have commenced clearing off the timber, and grubbing on the west side of Driftwood, in this county. Success to this invaluable improvement.—*Columbus Democrat.*

County.	Sold by Sheriff or failed.	Date of construction.	Name of works.	Situation, P. O.	Owners.	Lessees.	Kind of power employed.	No. Bloomery fires.	No. hammers.	Largest product Tons.	Actual make in 1849.	Form in which iron leaves the works.	Men and boys employed.	Horses, etc. employed.
Carbon,		1830	Marie,	Lehigh,	T. M. Smith and Est. of Richards,	None,	Water	2	1	10	10	Bars	6	2
"		1848	Pine Run,	"	J. & D. Lowrey,	"	Water	1	1	65	65	"	26	12
"		1820	Ashland,	Lehigh Gap,	J. J. Albright,	"	Water	1	1	80	80	"	12	8
"		1843	Anthony's,	"	N. Anthony,	"	Water	2	1	40	40	"	12	4
Monroe,		1820	Anatomink,	Stroudsburg,	John Jordan, Jr.,	"	Water	3	3	280	100	"	30	12
Northampton		1847	Jacobusburg,	Jacobusburg,	A. Benade,	C. E. Benade,	Water	2	1	70	40	"	12	2
								13	5	545	335		97	40

These six works all use the rich magnetic ores from New Jersey and consume about 3 tons of ore and 15 cords of wood to the ton of bars produced. The average annual capacity is 50 tons per fire, which, for the 13 fires in the State, would give 650 tons of bars, consuming 2,000 cords of wood and 1800 tons of ore.

These four forges all use steam. The one at Reading manufactures axles; the one at Papertown, blooms; that at Kensington steel plates; and the one at Frankford, saw plates.

A DETAILED STATEMENT OF THE BLOOMERY FORGES IN EASTERN PENNSYLVANIA IN 1850.

County.	Sold by Sheriff or failed.	Date of construction.	Name of works.	Situation.	Owners.	No. of puddling furnaces.	No. heating do.	No. forge fires.	Bituminous coal.	Anthracite coal.	Wood.	Pig.	Bloom.	Scrap.	Largest prod'ct.	Men, etc., employed.	Horses, etc. employed.	Capacity.
Berks,		1848	Reading,	Reading,	A. Taylor,	2	1	3	600	1000	1500	1000	450	100	10	14	3	600
Cumberland,		1849	Holley,	Papertown,	F. & M. Bank, Philad.	2	1	3	600	800	1500	1000	500	100	10	25	6	800
"		1849	Kensington,	Kensington,	J. Rowland & Co.	2	1	3	600	1000	1500	1000	500	100	10	7	1	1000
Philadelphia,		1850	Frankford,	Frankford,	W. & H. Howland,	2	4	3	600	1800	1500	1000	950	1000	410	59	12	3000

A Detailed Statement of the FORGES IN EASTERN PENNSYLVANIA, in the year 1850, not properly belonging to either of the other classes.

ed by freezing salt water, and experimentally showed the greater purity of water obtained by melting ice over common cisterns, and well-water, by the introduction of nitrate of silver into each. A still more perfect test was chosen, by the admixture of a solution of soap in spirits of wine. To show how this purity could be perfectly attained, notwithstanding apparently adverse circumstances, he mixed some water and sulphate of indigo, and by one of those happy expedients, for which he is famous, froze the mixture in a freezing compound by a revolving motion with one hand, as he kept stirring it with the feather end of a quill, so as to produce a cylinder of the purest ice. The experiment was repeated, with mixtures of water and sulphuric acid, and even of water and ammonia, and chemical tests were applied, to show the absence of all these several ingredients in the water produced from ice thus made. and the concentrated character of the residuum. By freezing all the water, he asserted that highly concentrated forms of these foreign bodies were produced. He showed by experiment, a fact which, previous to experiment, he had deduced by mere reasoning, in submitting ice to a heat of 300° Fahrenheit, when not exposed to the air (as under oil), which also renders water impure—and it exploded. He showed the fact of ice freezing to ice, and suggested some important consequences following from it; a similar power is created in a common snowball. But the introduction of gold leaf between two plates of ice prevents consolidation. He alluded, in glowing terms, to the labors of our distinguished townsman, Dr. Thomson, on the subject of the influence of pressure on freezing water. A pressure of eight atmospheres will lower the temperature of water, which while under the influence of fifteen atmospheres, will freeze; but an immense pressure prevents freezing. This pressure tends to liquify ice, and vice versa. It is unnecessary to point out to our readers, as Mr. Faraday appeared to think it unnecessary to him, the necessity of the law of gravitation, being taken into consideration in chemical theory, as these experiments show it should. The lecture was listened to with the deepest attention and interest by the most crowded audience of the session, comprising a large body of scientific men, and fashionables, whom we are always happy to see together.—*Prac. Mech. Jour.*

Tonnage of the United States.

Hunt's Merchants' Magazine for July contains a statement of the tonnage belonging to each collection district in the United States for 1849, from which we extract a few items which will prove interesting to our readers. We give the several districts of Maine entire:

	Registered.	Enrolled and licensed.	Total of each district.
Passamaquoddy,	7,549 76	9,566 99	17,116 75
Machias,	1,369 65	18,958 09	20,327 95
Frenchman's bay,	2,616 47	29,020 28	31,636 85
Penobscot,	5,794 91	30,689 29	36,581 25
Belfast,	10,569 46	32,504 27	43,073 73
Bangor,	11,168 14	13,548 14	24,716 55
Waldoborough,	31,975 02	56,740 49	88,751 51
Wiscasset,	5,068 40	12,020 89	17,089 44
Bath,	61,938 38	26,882 46	88,820 81
Portland,	57,657 01	26,011 79	84,568 80
Saco,	1,000 19	1,631 11	2,631 30
Kennebunk,	7,766 57	3,083 03	9,849 60
York,		1,057 44	1,037 34
			466,498 06

Canada.

We see it stated that the railroad contemplated from Niagara Falls via Hamilton, to Sandwich, opposite Detroit, is to be put under contract and commenced forthwith. From the suspension bridge at the Falls to Sandwich is 240 miles, and with the exception of getting up and down a mountain at Hamilton, the grade of the road is almost a dead level. Between Hamilton and Sandwich there is one portion of the road running fifty miles in a straight line.

Royal Institution.

Professor Faraday "On Certain Conditions of Freezing Water."

The last Friday evening meeting of the session was occupied with this subject, and the results of the researches made by this celebrated chemist appear to point to discoveries of importance, as the following concise report of the discourse will show:

The professor commenced by calling attention to the extraordinary attraction exhibited by particles of water among themselves, as compared with particles of water with other things. Chemical affinity and chemical attraction are but names of proceedings in nature which we do not as yet understand. He alluded to the purity of ice, and exhibited a block, weighing 140 lbs., from Norway, whence ice is now ordinarily obtained, and not, as lately, from America. There is no purer substance than ice, and this purity is attributable to the perfect expulsion from water of everything but itself. He stated there was no trace of salt in ice produc-

Stirling's Toughened Cast Iron.

One of the most recent of the practical novelties connected with the iron manufacture, is the system of toughening and strengthening the metal patented by Mr. Morris Stirling, whose late researches have opened up several new features in this most important branch of our staple productions. We say practical novelties, to distinguish the invention from the great mass of mere schemes which melt away to nothingness on the first working test—bringing discredit on their propounder, and disgusting the practical man who is tricked into a trial of their capabilities. That Mr. Stirling's improvement does not belie its name, has been satisfactorily established by its fast extending introduction in constructive engineering, and the uniform good opinion which has been expressed upon it by the first engineers of the day.

The process is so extremely simple in practice, that it hardly deserves the name. All that is done, is the placing pieces of wrought or scrap iron in the moulds used in forming the pigs of metal run from the blast furnace; the melted cast iron surrounds the solid scraps, and the incorporated mass becomes what, in the "prices current of metals," is termed "Stirling's patent toughened pig." In this state the iron is sold to the consumer, and when remelted in the founder's cupola for use, the mixture enters into chemical combination, producing, as the inventor remarks in his evidence before the commissioners appointed to inquire into the application of iron to railway structures, "to a certain extent, a diminution of the quantity of contained carbon, an alteration in the structure, and a differently formed grain."

Cast iron, so compounded, becomes close in the grain, and without any injury to its fusibility, has imparted to it an extraordinary toughness. In this way, while the great facilities of application of cast iron are fully retained in the toughened metal, many of the excellencies of malleable iron are given to it, making it, for all purposes where strength and lightness are essentials, a most valuable material for the railway engineer and the builder, and for many of the purposes of the general iron founder. The strength of the iron, of course, varies with the proportions of the added wrought metal—the average superiority over ordinary cast iron being from 60 to 70 per cent., while the maximum increase has been experimentally demonstrated to be 120 per cent.

In commencing his experiments, Mr. Stirling's idea was simply to improve or elevate the standard of the inferior irons—that is, to bring up the strength of the weaker and more fluid irons to an equality with the better kinds; but in working out these experiments, the remarkable fact came out, that all classes of iron are, by this admixture, brought to a general average strength, far exceeding that of the best cast iron. Taking Mr. Hodgkinson's results, we find that to break a bar of Blaenavon iron 1 inch square, and 4 feet 6 inches between the supports, requires an average of only 454 lbs.; the highest result being 578 lbs. In Mr. Stirling's own experiments with his toughened iron, the breaking weight of 868 lbs. has been reached; while Mr. Rennie, using Mr. Stirling's method, obtained more than 900 lbs.; the average may be taken at about 750 lbs.

The proportions of wrought and cast iron depend both upon the locality furnishing the iron, and upon the number or quality mark of the maker. As a general rule, the Scotch iron requires the greatest amount of scrap; the Welsh the least; while the Staffordshire iron is between the two. For Scotch, No. 1, hot blast, from 24 to 40 lbs of scrap must be added to the cwt., according to the richness of the iron; No. 2 requires less—from 20 to 30 lbs.; while for general purposes No. 3, hot blast, is not recommended for mixture, except for large castings, for which 15 or 20 per cent. of scrap produces an admirable iron. Each of the qualities of Staffordshire and Welsh iron requires considerably less than these amounts.

One of the first inquiries to be made in reference to the commercial introduction of any improvement, relates to its cost. In the case before us, there is no increase in the cost of the iron, except in relation to the original quality of the metal from which it is made. Thus, Scotch pig iron at £3 10, when the expense of the malleable iron and the

patentee's royalty is added to it, costs from 10s. to 15s. per ton extra; but as a set-off, the iron so made is 60 per cent stronger than iron which commands a price of £3 15s. and £4 per ton. The improvement on the best iron is not so palpable as on the worst qualities, although Mr. Rennie's experiments show that the best or Blaenavon iron is improved as much as 67 per cent. In fact, the whole of the experimental tests go to show that the mixture tends to bring up all iron to its maximum strength; and whichever of the three kinds of iron is taken, a proper proportion of scrap ought to give it an average of 700 or 800 lbs. on the square inch.

The annexed sketch exhibits a transverse section of a cast iron beam, used in testing the strength of the toughened iron when applied for this purpose. Two beams of each kind of metal were cast from the same pattern by Messrs. Grissell, the experiment being conducted at the new Palace of Westminster, under the superintendence of Mr. Barry. The ordinary castings were a compound of hot blast, Scotch, Blaenavon, and old iron in equal parts; while the toughened metal was made up of 80 lbs. of Kinneil iron to 23 lbs. of scrap. The beams were of the same section throughout their entire length—12 feet 4 inches—the bearing distance being 11 feet. The power was applied by a Bramah press, in the centre of the beams; and the breaking weight of the ordinary beams was found to be 15-93 tons, with a deflection of 15-16ths inch. The toughened beams broke with 22-5 tons, with a deflection of 1 inch. In testing the permanent set of the beams, the ordinary beam acquired a set of $\frac{1}{4}$ inch, with a pressure of 14-06 tons; but the toughened beam had a set of only 1-16th inch, with 16-87 tons.

The valuable report of the commissioners on the application of iron to railway structures, which we have previously quoted, shows that the new iron has been deemed sufficiently important to require a long and careful investigation along with the various specimens selected for experiment in the course of this extensive inquiry. In the trials of tensile strength, the second quality required 11-502 tons per square inch of section to break it; the highest result from Blaenavon being 7-466 tons. The average crushing strength of the second and third qualities was 54 and 64 tons respectively—Blaenavon, No. 2, 49 tons. The mixture for trying the transverse strength was No. 1, hot blast, Staffordshire, from Ley's works, with 15 per cent. of malleable iron, forming toughened metal of the third quality. The dimensions of the bars were: length 10 feet 17-120ths inch, weight 119 lbs.; weight between supports 106-97 lbs.; depth 2 inches; breadth 1-97 inches. The mean results, with a weight of 1,344 lbs., gave a deflection of 1-939 inches, with a set of 223 inch. The mean breaking weight was 1,470 lbs., with an ultimate deflection of 2-178 in. To compare such results with those of other kinds of iron, would obviously lead to considerable detail; but the practical worker in iron will be able to make his comparisons with the results of his own experience.

All engineers are agreed on the point of the superior strength derived from a mixture of various kinds of iron, and Mr. Fairbairn, in his evidence before the commission, cites Mr. Stirling's improvement as a very decided step in advance of all previous combinations, giving examples of the tests of girders, where the compound iron, compared with ordinary metal, was as 33-25 to 51-5.

Several of the most eminent iron masters in Scotland are licensees of the invention, and at the Dundee works a very extensive series of experiments has been tried upon various compounds of the Dundee iron. The mean breaking weight of the ordinary Dundee cast iron—in bars 1 in. square, 2 feet 3 inches between supports—has been experimentally ascertained to be No. 1, 860; No. 2, 926; and No. 3, 892. The same iron, No. 1, with 32 lbs. of scrap to the cwt., required 1,434 lbs. to break it; and No. 2, with 29 lbs. of scrap to the cwt., gave a result of 1,419 lbs. The great difference in the texture between malleable and cast iron and the observed behaviour of the former under intense heat, has all along led us to believe that any attempt at so curious a combination would result in a mere partial mechanical mixture; and, until Mr. Stirling actually showed that wrought iron does fuse and combine chemically with cast iron,

the idea was utterly scouted. The combination is, however perfect, and complete homogeneity is always secured when proper precautions are taken in mixing.

The iron is now being introduced in several large engineering works, for girders, beams, shafts and rolls; and the Corrugated Iron Wheel Company have, in several cases, specified it in their arrangements with contractors. Another branch of the invention provides for the strengthening of wrought iron, and the prevention of lamination under rolling pressure, as in railway bars. For this purpose, either common or toughened pig metal is alloyed with calamine in the puddling furnace. Another process comprehends the addition of a small quantity of tin to the iron in the puddling furnace. The metal thus treated is found to be very hard, crystalline, and anti-laminating. The iron is used for the surfaces of rails and wheel tires, by rolling it along with a greater bulk of the calamine iron.

As the practical results of the introduction of this toughened metal become developed, we shall follow up the subject with additional details.—*Practical Mechanics' Journal.*

Mobile and Chicago Railroad.

We copy the following from a statement laid before the House of Representatives relative to the route of this great work:

The best route for this great improvement has been ascertained by elaborate surveys. It passes through five states as follows: 63½ miles in Alabama, 271 miles in Eastern Mississippi, 119½ miles centrally in Western Tennessee, 39½ miles in Western Kentucky, and 375 centrally in Illinois; making the distance from Mobile to the mouth of the Ohio river 494 miles, and the entire distance from the Gulf Mexico to Lake Michigan 867 miles. Its general course, from Mobile to the Ohio river, is slightly west of north, thence to Chicago about the same degree east of north. It crosses no navigable stream (great or small) except the Ohio river, at or near its mouth. It is an average distance of 90 miles from the Mississippi river, and not less than 50 miles average distance respectively from the Illinois and Wabash rivers. Unobstructed by the tributaries of the Mississippi river on the west, it is equally clear of the Tombigbee, Tennessee, and Wabash rivers on the east. Thus, in its course nearly due north and south, it occupies a belt of country almost entirely destitute of natural channels of communication, and forms at the same time the most direct, cheap, and durable trunk line of railway that can be projected for the great valley of the west. In length it is only 11 per cent longer than an air line, with no ascending gradient going south steeper than 30 feet per mile, and none going north over 40 feet per mile; and its highest point of elevation south of the Ohio river, above tide, 505½ feet. Its position for the intersection of other cross or diverging lines of railway is at all points very favorable, to wit: 120 miles from Mobile, in Clark county, Mississippi, it will cross the Vicksburg and Montgomery line; 150 miles from Mobile, in Kamear county, Mississippi, it will receive a branch line from the coal fields of the Black Warrior valley, via Tuscaloosa; which branch may eventually be extended to Huntsville, Alabama. In Tishomingo county, Mississippi, it will connect with the cross line of road from Memphis, Tennessee, through North Alabama to the Georgia railway, at Rome or Chattanooga. By a branch road 23 miles long it will intersect the Tennessee river below the "Great Bend Shoal," 346 miles from Mobile. This branch, extended through Columbia and Nashville, Tennessee, to Louisville or Frankfort, Kentucky, and thence to Cincinnati, forms a connecting line of immense value to the States of Tennessee, Kentucky, Indiana, and Ohio, and to the several railway interests leading from these states to the Atlantic cities. At Columbus, Kentucky, it will receive a branch from the St. Louis and Pacific line, via the Iron Mountain of Madison county, Missouri. About 60 miles east of St. Louis it will intersect the important lines from that city and Alton to Cincinnati and Louisville. Still further north, and half way between the Ohio and Lake Michigan it will cross the very direct easterly line from Springfield, Ill., to Indian-

apolis, Columbus, and Baltimore. At Peru, the southern terminus of the Illinois and Michigan canal, it will branch to Chicago and Galena, to gather the traffic of the lakes and the Upper Mississippi, and finally be extended northward to Lake Superior.

The distances by this road from several important inland towns to the Gulf, as compared with the river channels, may not be without interest, to wit:

Bend of Tennessee river, via railroad. 376 miles.
do. " " via Tennessee and Mississippi rivers.....1,455 "

Difference nearer by railroad, in time
160 hours, and.....1,079 "
Memphis, Tennessee, via railroads 461 "
do. do. via Mississippi river.....913 "

Difference nearer by railroad, in time
90 hours, and.....452 "
Huntsville, Alabama, via railroads... 478 "
do. do. via Tennessee and Mississippi rivers.....1,542 "

Difference nearer by railroads, in time
170 hours, and.....1,064 "
Nashville, Tennessee, via railroads... 508 "
do. do. via Cumberland and Mississippi rivers.....1,641 "

Difference nearer by railroads, in time
175 hours, and.....1,133 "
Mouth of the Ohio river, via railroad. 526 "
do do via Mississippi river.....1,156 "

Difference nearer by railroads, in time
89 hours, and.....630 "
St. Louis, via railroads.....700 "
do via Mississippi river.....1,366 "

Difference nearer by railroads, in time
133 hours, and.....666 "
Cincinnati, via railroad to Nashville and Mobile.....770 "
Cincinnati, via Ohio and Mississippi rivers.....1,666 "

Difference nearer by railroads, in time
168 hours, and.....896 "
Chicago, via railroad.....900 "
do via Illinois canal and Illinois and Mississippi rivers.....1,734 "

Difference nearer by railroads, in time
171 hours, and.....834 "

The total cost of this road, from Chicago to Mobile, 867 miles, constructed with a heavy iron rail, 65 pounds to the yard, and fully stocked with machinery for its opening business, in proportion to the extent and productiveness of the country, will not exceed \$20,000 per mile, or an aggregate of \$17,340,000.

The construction of this road is a matter of importance to every business man in the U. States. It would add hundreds of millions to the aggregate value of the property of the country, and its construction can be secured by the passage of the bill now before the House of Representatives, granting a certain portion of the public lands to its aid—lands that very probably will be of no benefit to the general government if retained, and which certainly can never be productive of so much good to the country as in the manner proposed.

Georgia.

Atlanta and Lagrange Railroad.—We have been favored with a copy of the first annual report of the officers of this road, submitted to the stockholders on the 25th of May last.

One great object of the work is to connect the Georgia railroads with the Montgomery and West Point railroad, which is now in progress, and will

soon be completed to the Chattahoochee river in Alabama. The above link would then open an easy and expeditious route of railroad and steamboat to the gulf, and its construction therefore becomes a matter of interest to every business man and traveller, to say nothing of its importance to those living on its line.

The whole route has been surveyed and located. It has generally a southwesterly direction, passing through the towns of Newnan, in the county of Coweta, and Lagrange, in the county of Troup.

The length of the road is 86 miles, as follows:

From Macon and Western railroad, to Newnan.....32½ miles.
From Newnan to Lagrange.....32½ "
From Lagrange to west bank of river at West Point.....15 "

Total length to construct.....79½ "
Add Macon and Western railroad used. 6½ "

Whole distance.....86 "

The whole estimated cost of the road, with the equipment, is \$944,000, or about \$11,000 per mile. The rail is to weigh 45 lbs. to the yard, and is to be of the T pattern, this size being adopted from motives of economy. The engines to be used are not to weigh over 35,000 lbs.

The first division of the road, embracing 32½ miles, is now under contract. About one third of the grading and masonry for this distance is completed, and the balance is progressing with rapidity. At the meeting of the stockholders it was expected that the work of laying the superstructure would be commenced on the 15th of July last, and would be completed to the north line of Coweta county before the close of the year; and, it was hoped, to Newnan by the first day of May next.—The grading of the road beyond Newnan has not yet been let, though the engineer recommends that this should be done without delay.

A glance at a map will show the importance of this work, as a part of a great through route between the Atlantic and the States bordering on the Gulf; connecting, as it does, the only road in operation in Alabama, and the railroads in Georgia. Its prospective local business is large, as it will traverse one of the most fertile, thickly settled, and wealthy parts of that State. The estimated net receipts of the different divisions are as follows:

From Atlanta to Newnan.....\$39,150
" " Lagrange.....69,700

From the road when completed.....139,500
Equal to 14 per cent. upon its cost. This will strike people as a very large estimate, and is probably much more than will be realised; but as this road occupies a very favorable route, we have a right, from the uniform success of the Georgia railroads, to anticipate for it a good income, sufficient to satisfy a reasonable ambition. In relation to this point the engineer says:

"Increased facilities and comforts, together with decreased time and expenses, will attract to this route a large portion of the travel between New Orleans and the northern cities, which now passes by the western routes. In reference to through travel we need not entertain fears of successful rivalry. On the east, no line of road is now proposed, (of the construction of which there is a reasonable probability,) the design of which is to connect with the great mail route north and south of us, which can obtain any advantage over yours in distance or time. Our position is equally important in reference to the chain of roads which are now being constructed through East Tennessee and Virginia. No line yet proposed on the west, can offer a shorter or quicker communication between the last named chain and the navigable waters of the

Alabama river, than the chain of which your road will form a link.

Our freighting business in dry goods will extend through the heart of Alabama and embrace a portion of Eastern Mississippi, while our return freights will supply Western and Northern Georgia, and East Tennessee, with groceries from the Gulf.

No portion of Georgia, embracing an equal area, is capable of supplying a larger amount of local business, both in travel and freight, than the country immediately tributary to your road; and this can be said of its present population and productions, without anticipating the stimulus which the road will impart to every branch of industry.

These prospects, though flattering, are not delusive. The business of your road is already formed—you have not to wait the development of the resources of a new country before you can give to the stockholders a fair return upon their investment. This fact, when properly understood, will give to the stock a higher and increasing value.

In concluding this report, it affords me pleasure to acknowledge the valuable aid received from my principal assistant, Robert Douglass, Esq., who has had general charge of surveys and construction during the past year. To his good judgment, skill and industry, the company are mainly indebted for the favorable location between Newnan and Lagrange. The assistant engineers, George Hull and C. O. Davis, have also performed their duties with skill and commendable zeal."

J. P. King, of Atlanta, is the President of the company, and L. P. Grant, Chief Engineer.

For the Railroad Journal.

Objections to the Opinion that the Failure of the Iron Bridge on the New York and Erie Railroad was Caused by Expansion.

The Railroad Journal (August 24th, 1850) says:

"The cause of the giving way of the iron bridge on the Erie railroad is believed to be the pressure of the ends of the bridge by expansion from extreme heat, against the abutments. This threw the bridge out of a true line, and of course diminished its strength. Such is the opinion of persons well qualified to judge in these matters."

I must be allowed respectfully to return that bill with objections.

1. The only parts that could be thrown out of a right line by thrusting against the abutments, and have their strength diminished thereby, were, the upper stringers of cast iron, and if these were not actually above the tops of the abutments, they were only between the very topmost courses of stone, which undoubtedly would have yielded sufficiently for any expansion of the metal.

2. It appears like a very improbable supposition, that those stringers were so snugly fitted as not to have had a quarter of an inch space for expansion, when it is notorious that railroad bars of 18 feet are always allowed about one-eighth of an inch for expansion, and what could all the engineers, as well as the contractors, have been about, to have allowed these stringers of 70 feet to be wedged in between abutments without a bit of room for expansion?

3. But not to dwell unnecessarily upon the matter when the thing can be set at rest at once, even supposing those very top courses of stone, held in place only by their own weight, the adhesion of coarse mortar, and the pressure of a few inches depth of earth on the back of the abutments, were absolutely immoveable; and that those stringers, for no useful purpose under the sun, were wedged in between these abutments so that they could not expand in length one hair, the admission of all this grand compound of absurdity, would not help the case one atom. For the natural and inherent elasticity of the metal, which it is impossible even to suspect of having been for a moment suspended,

would have accommodated all the effects of expansion without the least injury to the structure.

The cross section of those stringers was about 12 square inches to each, and a load of one ton to the running foot on the bridge, besides the weight of structure, (which the bridge certainly should have been able to bear with safety,) would produce a thrust of about 100,000 lbs. on each stringer at the centre, or say 8,000 lbs. to the square inch—a pressure which would shorten the stringer 3-100 of a foot ($\frac{3}{100}$ of an inch) according to the known elasticity of cast iron; and this amount of compression would accommodate the expansion due to 70 deg. increase of temperature. Therefore, unless the stringers could bear, even confined between two "rocks of ages," an increase of 70° of Fahrenheit, they could not bear the compression due to the load, which every railroad bridge should be able to bear with safety.

This range would extend from the freezing point to 102° which I regard as beyond the extremes of probability in both directions.

I believe, though I cannot vouch for it, that the bridge was erected in moderate weather, a good deal above the freezing point, and that the accident occurred early in the morning, before sunrise, when the thermometer could not have stood above 80°.

Those who will, may endorse the qualifications for judging in such matters, of persons expressing such opinions as those above quoted, as to the failure of the Lackawana bridge. And those who can, may show the absurdity of my explanation and opinion relative to the cause of the same accident, published in the N. Y. Daily Tribune on the 14th August, inst. S. WHIPPLE.

New York.

Albany and Rutland Railroad.—We learn that more than four-fifths of the stock necessary to the completion of this road has been subscribed, and that the remainder will soon be secured.

The road is to be placed under contract as soon as the location and estimates can be completed.—The line is to run through Bennington, and will be about 86 miles long.

The following named gentlemen are the officers of the company:

President—Marcus T. Reynolds, Albany.
Treasurer—James Edwards,
Secretary—Albert D. Robinson, "

Hudson River Railroad.—The following gentlemen constitute the board of directors of this road for the present year:

James Boorman, Moses H. Grinnell, Gardner G. Howland, John D. Wolfe, Gouverneur Kemble, Edwin D. Morgan, Elisha Peck, Erastus Corning, James Hooker, William C. Redfield, Edward Jones, Charles H. Russell, Drake Mills.

The officers of the board are as follows:

James Boorman, President; Edward Jones, vice president; Wm. C. Young, chief engineer; Oliver H. Lee, superintendent of road in operation; John M. Hopkins, treasurer; George B. Butler, secretary and legal agent.

Ogdensburg Railroad.—The following named gentlemen have been chosen directors of this road for the present year:

T. P. Chandler, J. Wiley Edmunds, R. G. Shaw, B. T. Reed, of Boston; J. Spaulding, president of the Concord railroad; C. Paine, ex-Governor of Vermont; H. Horton, of Malone; J. L. Russell, of Canton; G. N. Seymour, H. Van Rensselaer, of Ogdensburg; G. Redington, of Wadlington; G. J. Floyd, of Champlain; and J. H. Titus, of N. York

city. At a meeting of these directors, T. B. Chandler was unanimously elected president, J. G. Hopkins, of Ogdensburg, secretary; and M. T. Enstis, of Boston, treasurer.

The Buffalo Courier says:—"We hear that the basis of a consolidation of the Attica and Buffalo and Tonawanda railroad companies has been agreed upon, and that no doubt is entertained of its speedy consummation. By the new arrangement a new track is to be constructed from this city to Batavia, on a route nearly straight and almost level, by which the distance is shortened some eight or nine miles, and a proportionate saving made of time."

Railroads in Illinois.

The principal railroads in this State are, 1st, **The Alton and Sangamon Railroad.**—This road, which is to run from Alton to Springfield, the capital of the State, is under contract, and will be pushed rapidly forward to its completion. We believe that the iron for a considerable portion of it has been contracted for.

The Atlantic and Mississippi Railroad.—This road is to extend from Terre Haute to the Mississippi, opposite St. Louis. The company has been organized, and the work of construction is soon to be commenced. From Terre Haute, continuous lines of railroad are in progress to all the great Atlantic cities. The above work will carry them to the Mississippi river, which is now looked upon as the present terminus of all. This work derives great importance from this fact, independent of local considerations, which alone we believe to be a sufficient inducement to warrant its construction. From its importance to other roads, it will be likely to receive important aid from such should it be required; and we think we may put this down as a work which is sure to be constructed within a reasonable time. It is one of those lines that must be constructed for the accommodation of the business and travelling public, and which is necessary to give the full value to the different roads with which it will be connected.

In addition to the above we believe that efforts are making to secure a railroad from Terre Haute to Alton, but we are not well informed as to the progress made in relation to this project.

Rock Island and LaSalle Railroad.—This is a very important line, and is to connect the Illinois canal with the Mississippi at Rock Island, at what are termed the *Lower Falls of the Mississippi*.—This river falls here about 15 feet in a short distance, and the navigation is seriously obstructed at a stage of low water. At the falls the river is separated into two channels by "Rock Island," and this is believed to be the lowest point where it can be bridged at moderate expense, and without injury to navigation. The length of two bridges will be 1800 feet; one 400, and the other 1400. The ledge which makes the fall, extends entirely across the river, and affords the very best foundation for abutments. Rock Island is in the same line of latitude with the southern shores of lakes Michigan and Erie, and of course must be on the line of the great proposed railroad running west. It is also very nearly in the same parallel with Council Bluffs, the proposed crossing of the Missouri for a railroad. The Rock Island and LaSalle railroad, therefore, possesses a great importance, from the fact that the line is located by natural features of the country. It occupies the very route that any person unacquainted with the topography of the country would point out as the one best fitted to meet the wants,

and suit the convenience of every section. On reaching LaSalle, the road would be in communication with Chicago, by the Illinois canal. From Chicago a road is now in operation, or will be in a few days to Aurora, on Fox river. From this point to LaSalle the distance is 55 miles, and measures are now in progress to construct this link. The Rock Island and LaSalle railroad company are actively at work, and have already obtained subscriptions nearly sufficient to grade their road. It is one of easiest construction, and can be completed as soon as can the links in the great chain further east. We soon expect to receive the report of the surveys of this road, when we shall again call attention to it.

Chicago and Galena Railroad.—This road is in very successful operation to Elgin, 41 miles from Chicago. The company is preparing to commence the construction of another division of about the same length, extending to Belvidere on Rock river. The portion opened is doing so well, the company will, we presume, find no difficulty in obtaining sufficient means for the vigorous prosecution of the remainder of the line. The success of that part opened must inspire confidence in the ability of the company to meet all liabilities incurred on account of construction.

The Springfield and Meredosia Railroad has been in operation for some time past, but with what success we have not learned. Measures we believe are in progress to push this road to the Mississippi river, which will materially promote its interests. Its want of such a connection, and the general direction of the road, must be serious drawbacks to its usefulness.

The commencement of the *Great Central railroad* is yet in abeyance, depending upon aid from the general government. Should this be granted, it will be commenced immediately, and it would become the parent stem of innumerable branches penetrating every portion of the State. Railroads in Illinois are to become the ordinary means of travel and transportation for the whole population, and no State in the Union, in a few years, will exhibit a more rapid progress than Illinois in these works.

Ohio.

Ohio and Mississippi Railroad.—The new effort which is making to bring this project prominently before the people of Cincinnati again, and to obtain for it the favorable action of our City Council, has the approbation of our most substantial and enterprising merchants and manufacturers.—A large number of our capitalists, some of whom have been lukewarm with reference to the work heretofore, now favor it; and the more enlightened of our mechanics and laborers give their hearty approval.

The new effort contemplates, at every step in the outset, an individual subscription equivalent to what shall at any one time be asked from the corporate authorities. It is proposed, we believe, to ask the City Council to make a loan of the credit of the city to the company, to the amount of \$800,000; (\$200,000 of the million authorized by law having been loaned to the Hillsborough road;) but before this shall be done, individual subscriptions are to be secured, equal to the amount (two, three, or four hundred thousand) which it is proposed to ask at any one time; and the same with reference to future instalments; the money so raised from both sources, to be expended on that section of the road running west from this city.—*Cincinnati Gazette.*

GORHAM'S COMPOSITION, to Remove and Prevent Incrustation (or Scale) in STEAM BOILERS.

THIS valuable composition having been fully and extensively tested, is now offered to the public, as a sure remedy and preventive for incrustations in steam boilers of all descriptions. By its use, all scale is entirely removed from the boilers of Ocean and River Steamers, Locomotives and Stationary Engines, in from 3 to 20 running days, according to the size of the boiler and thickness of the scale. In New Boilers, all incrustation is prevented at a trifling expense. The preservation of the boiler, great economy of fuel and labor, safety, and increased speed, are among the advantages to be derived from the use of this composition.

Orders should state the quality of water used, viz. "Salt," "Fresh," or "Brackish."

For sale, with directions for use, by

W. H. NEWMAN,
75 Pearl street,
New York.

TESTIMONIALS.

New York, August 17, 1850.

We have used Graham's Composition in the boilers of the Steamship Southerner, during several voyages between this place and Charleston. The boilers were old and very foul with scale, a very large quantity of which was removed by the use of the composition, and no new scale was formed.

From our own experience and observation in the use of the article, we are fully satisfied that it will effectually remove the incrustation made by sea water, and also that it will effectually prevent its formation.

We are also satisfied that the use of it will be attended with a great saving of fuel, and that it has no injurious effect upon iron.

DAVID N. MAXON, Engineer,
BERRY, Master,
Steamship Southerner.

Steamship Philadelphia, }
New York, August 27, 1850. }

I have used "Graham's Composition for Steam Boilers," in the boilers of Steamship Philadelphia, on the voyage to and from Chagres, and am entirely satisfied that it will remove, dissolve and prevent all scale or incrustation in salt water boilers.

For the preservation of the boiler and economy of fuel and labor, I hereby recommend the employment of this composition in the Boilers of Ocean Steamers.

WM. HISBY,
Chief Engineer.

Novelty Iron Works, }
New York, July 5, 1850. }

We have examined the specimen of Graham's Composition for preventing incrustation of steam boilers, and we believe it may be used with perfect safety in reasonable quantities for the purpose intended, as there does not appear to be any agent in the composition calculated to injure the iron.

STILLMAN, ALLEN & CO.

Plymouth, May 20, 1850.

I have used "Graham's Composition," and find it to produce the intended effect; and I hereby, without hesitation, recommend it for Stationary, Marine and Locomotive Engine Boilers.

JOHN BRANDT,
Superintendent Motive Power
New York & Erie R.R.

New York, July 25, 1850.

In answer to many inquiries as to the practical effect of "Graham's Composition," I will state that I have used it in the boiler of the Steamboat Sunnicks, which had become considerably incrustated with hard scale from both salt and fresh water. We used 10 lbs. per day, for three days, without blowing off the water, until the fifth day, when all was drawn off. To our astonishment, we found the whole interior of the boiler as clear of scale and smooth as when it came from the hands of the maker. The following week, we tried the same quantity in a small steam tow boat. The boiler had old scale of long accumulation and very thick. We ran the boat three days without blowing off, and on the fourth day washed out the boiler and found it, like the "Sunnicks's," perfectly clean and smooth as when new. I am therefore enabled to state that the use of the composition in these two instances under my own immediate observation and direction, has been attended with complete success.

JAMES MORROW,
Engineer Astoria Ferry.

AMERICAN RAILROAD JOURNAL.

Saturday, August 31, 1850.

Panama Railroad.

We are gratified to have it in our power to lay before the public some authentic information respecting this most important work. From the want of publicity hitherto attending the operations of the company, we have been almost induced, along with many others, to entertain many apprehensions that this magnificent enterprise had received a check, in consequence of the very unusual difficulties that must necessarily attend the execution of a work of its magnitude in a country so far removed from the seat of directorship, and in itself affording no facilities whatever for the furtherance of the project; but in making diligent enquiry from the most reliable sources, we are rejoiced to ascertain beyond all doubt, that so far from such being the case, the company are now making arrangements on a large scale, for securing the running of locomotives from Navy Bay to Gorgona by the end of the next dry season. When this is effected, passengers can cross the Isthmus from ocean to ocean between sunrise and sunset.

The accounts of the surveys are already well known. Near the end of the year 1849, the company having determined to enter upon the actual construction of the road, appointed as associate Chief Engineers, Messrs. George M. Totten and John C. Trautwine, both of whom had been employed on several of the most important works in the United States; and had besides become acquainted with the language and manner of working the native laborers of New Granada, during a previous residence of some years in that country, while engaged in the construction of the canal from Carthagena to the Magdalena river.

The operations on the Isthmus have until lately been conducted by Mr. Trautwine, Mr. Totten having been prevented by a prior engagement from giving his personal attention to the work.

The first three months of Mr. Trautwine's residence on the Isthmus were directed to the endeavor to establish Gorgona as a starting point, and depot for the receipt of provisions and materials of construction from the United States, it having been originally the intention of the company to construct the interval between Gorgona and Panama first. The losses, delays and expense of surmounting the impediments of the navigation of the Chagres river, combined with other considerations developed by this attempt to commence at Gorgona, determined the directors to establish their depot, and commence their road, at the Atlantic terminus. The precise point had not been absolutely determined, and Mr. Trautwine devoted his first attention to another careful examination of the coast as far as Porto Bello, which resulted in fixing it at Manzanilla Island, the same point contemplated under Col Hughes' survey. The island was at the time covered with a dense growth of trees, shrubs and vines, which had to be cleared away before habitations for laborers could be erected upon it, and no preparations having been made to commence at this point, the engineers and men were obliged to live on board a brig which arrived with materials for houses, and on the hull of the steamer Telegraph, which Mr. Trautwine happened to be able to purchase at Chagres, until the island could be sufficiently cleared and houses erected. Until these difficulties were removed, Mr. Trautwine was unwilling to receive laborers en-

gaged by Mr. Totten in Carthagena; but these are now at an end; a large storehouse is erected for provisions and materials; the other buildings are in progress, and Mr. Totten is on the spot with a force of about 200 men, fixing definitely the location, and clearing the line of the road; while Mr. Trautwine is now in this country with full knowledge of the whole condition of things on the Isthmus, to return the early part of next month, completing all the arrangements that may be required to secure the running of locomotives from the Atlantic to Gorgona, by the end of the next dry season.

With the view of expediting the work the road is to be built temporarily, (wherever the surface of the ground will permit), upon piles instead of embankments. The piles are to be sent from this country, cut to the requisite dimensions, and pointed for driving. Six steam pile drivers will be sent out to different points on the line of the road, and all the preparatory work possible will be done here, so as to save labor on the Isthmus; while to meet such as is indispensable there, arrangements have been made with the Royal West Indian Mail Steam Packet Company, at a low rate, for carrying to the Isthmus a large force of native laborers, from Carthagena, and the interior provinces.—Negroes are to be brought over from Jamaica; a body of white men has already gone down from New Orleans, and to guard against all risk of failure, advantage will be taken of the California excitement to carry to the Isthmus a large force from this country, under a special contract, the basis of which is a passage to California. The cross ties, pile drivers, and other materials are already purchased, four locomotives are to be built as soon as the contract can be made; and a contract has been closed with the "American Timber Preserving Company" of this city for submitting all the piles, cross-ties and other timber, to the preservative process of "Payne-izing," with the view of protecting it from decay, and the ravages of worms. The transportation of men and materials between Navy Bay and the different stations on the Chagres river, will be under the charge of Capt. Chapman, who has been for some years engaged in running a steamer with native labor on the Magdalena, and who will have in his employ a body of picked boatmen from that river, while to furnish immediate facilities for travellers, an arrangement has been made with Mr. A. G. Jewett of Maine, under which Mr. Jewett will have two small steamers and a full complement of small boats for transportation to Gorgona.

The opening of the railroad to Gorgona will of course afford great facilities for the further prosecution of the work, and it is confidently believed that by the end of the dry season of 1852, a temporary railroad will be completed to Panama, ready to transport passengers with their luggage and light freight from ocean to ocean in not exceeding six hours. The perfecting of the work can then be carried on at leisure.

Details of construction (as all the particulars of a road to connect the two oceans are interesting) will be given in a subsequent number; in the meantime we are happy to find on inquiry that, although silent, the company is not idle; and, with the view of answering questions on this subject we publish the present organization of the company, which we observe is much the same as at its commencement, with the exception that Mr. Ludlow, who had consented to hold the office during Mr. Stephens' absence in New Granada on the business

of the company, has resigned as president, and Mr. Stephens has been elected in his place.

BOARD OF DIRECTORS.

JOHN L. STEPHENS, President.

William H. Aspinwall,	Thomas W. Ludlow,
Henry Chauncey,	David Thompson,
James Brown,	Joseph B. Varnum,
Cornelius W. Lawrence,	Samuel S. Howland,
Gouverneur Kemble,	Edwin Bartlett,
S. B. Ruggles,	E. J. Woolsey.

Francis Spies, Secretary.

Horatio Allen, Consulting Engineer.

Geo. M. Totten, } Associate Engineers in
John C. Trautwine, } Chief.

James L. Baldwin, Principal Assist. Engineer.

Railroad Securities.

There is no more equitable way to obtain means to build a railroad, than for a town or county interested in its construction to pledge its collected credit for the money to be hired. People are benefitted by these works in proportion to the property they possess. It is right that they bear the burden in the same ratio.

Credits based upon the guaranty of towns and counties are regarded with favor in this market; but to render them available, they must be based upon the concurrence of a very large proportion of the population. The opposition of a large and clamorous minority can defeat a loan just as effectually as if it were in a majority. Monied men are not going to lend their money when any question can arise as to the goodness of the security, or the disposition of those receiving it to repay it.—This minority may soon become a majority, and repudiate the debt altogether.

Money is abundant, and can be had upon reasonable terms upon undoubted security; and if our western friends want it, they must come with united hands. A portion, or a faction, cannot get it.—We say this for the purpose of putting people right in this matter, and of letting them know how they can come into this market with certainty of success. If they get into a quarrel at home about giving their credit, they had better stay at home after it is voted.

Iron Manufacture in New England.

We have received the memorial of the iron manufacturers of New England to Congress, praying for additional protection to this article.

This branch of our domestic industry is very much depressed in New England and New York, and we think additional duty would not materially help those engaged in turning out the raw material. We have long believed that the furnaces of this section could not stand the competition of those of Pennsylvania, which enjoy such superior means of making a cheap article. With anthracite and ore side by side, the Pennsylvania iron maker can undersell, by many dollars on the ton, the northern and eastern manufacturer who uses a much more costly fuel, and who is compelled frequently to transport his ore for a considerable distance. For the better kinds of iron we may still be obliged to resort to our charcoal furnaces, and for such, increased duty is almost indispensable; but those making an ordinary iron had better shut up shop and go to those districts where coal and iron are found together—where all the elements of cheap production exist in the same vicinity, and in inexhaustible abundance. With any amount of duty, many of the northern furnaces would soon be compelled to yield to the superior advantages of other parts of the country. This fact should receive the

attention of these iron makers, as well as the question of protection from the foreign article.

In another number we shall give the substance of the memorial.

To Railroad Companies and Mechanical Establishments.

A Person of considerable experience and practical knowledge in Mechanical, Civil and Marine Engineering, is anxious to meet with an engagement with either a Private Individual or Public Company, who may have works either to design or execute in the above branches of the Engineering Profession.

Address Z. Y., 47 Atlantic st., South Brooklyn, L.I.

Maine.

European and North American Railroad Co.—The Legislature of Maine have incorporated, under the above title, a company to build that part of the line running through that State, and have appropriated \$5,000 for a survey of the route. This is a good beginning, and will we trust be vigorously followed up by the future action of the company.

The city of Portland has, by a vote of 1088 to 111, loaned its credit to the Atlantic and St. Lawrence railroad for an additional sum of \$500,000, making \$1,500,000 in the whole.

Pensacola and Columbus Railroad.

We see it stated in the Florida papers that this project is again to be started in such a manner as to give assurance of success.

Stirling's Patent Cast Iron.

Our readers will do well to look at the article upon this subject in our present paper.

Ohio.

Cleveland, Sandusky and Toledo Railroad.—A spirited railroad meeting was held at Elyria, day before yesterday. Delegations from Oberlin, Norwalk, Milan, Sandusky, Bellevue, Fremont and other places were present, to represent the different interests and the advantages of the various lines travelled. After hearing the claims of all, and carefully weighing the whole matter, the Directors of the Junction railroad company decided to locate the road commencing at a point on the Cleveland and Columbus road, about fifteen miles west of Cleveland, through Elyria, thence by the most feasible route to Sandusky; and from there to Fremont, provided the citizens of that place raise a given amount of subscription, and thence to Toledo.

By this arrangement the Western road will lay their track for the first fifteen miles out of Cleveland beside the track of the Cleveland and Cincinnati road. And we understand that this arrangement will be carried out unless some superior inducements are offered for carrying the road into Ohio City.

Subscriptions to an amount nearly sufficient to grade and bridge the road from Cleveland to Sandusky are already provided, and the executive committee, consisting of Judge Lane, and Alexander Porter, of Sandusky, Dr. DeWitt, of Elyria, and H. B. Ely, of Cleveland, are instructed to put the whole road under contract at the earliest practicable period.

There is every indication that the work will be pushed forward vigorously, until the whole is completed.—*Cleveland Herald.*

Sale of State Railway.

The Canal Commissioners of this State have given notice that sealed proposals for the sale of that portion of the Columbia railroad, from the eastern end of the Schuylkill Inclined Plane, in-

cluding the Schuylkill viaduct, to the corner of Vine and Broad streets, Philadelphia, will be received until Thursday, the tenth of October. The local trade on this portion of the road, it is stated, is annually on the increase. The tolls received in 1849 from the Reading railroad company, and from the local trade and travel between the plane and the city, amounted to \$24,443.

Illinois.

This State has now pretty well recovered from the embarrassments into which her extravagant and reckless expenditure of money, upon public works, commencing in 1836, plunged her; and with the experience of the past, she is again commencing their construction upon a basis which gives every prospect of success.

The immense sums lost by some of the Western States in their attempts at internal improvements, and the failure, in consequence, of some of them to meet their liabilities have led monied men to look with distrust upon western securities; to reject them as altogether worthless, this class of men following, (as they usually do), in the wake of the public sentiment, delirious with excitement in 1836 and 1837 were then the most eager for these securities, when ordinary prudence and foresight would have dictated an entirely different course.

When the public works of Illinois were projected and commenced, all the conditions of success were wanting. Time was necessary to create them. She had no trade, no accumulated property, and only a very scattered population, numbering less than 300,000. She had no trade, neither financial, mechanical, nor engineering skill nor experience to successfully superintend and carry out these works. It is very easy now to see that failure then was inevitable. Railroads are merely the instruments of commerce and transportation, and where neither commerce nor people exist, their success is impossible. In many parts of Illinois lines of great extent, which were graded in 1837, are now covered with dense forests, so that the track can hardly be distinguished from the surrounding country. The whole of the stupendous system then planned, has been utterly abandoned. The people of the State became so disgusted with the policy which had been pursued, that they changed their constitution, and forbade the State engaging for the future in her corporate capacity in such works. But the increase of population and business having rendered railroad matters of necessity, the old abandoned lines, upon which much work had been done, have been in many instances purchased by individuals, and their completion is in progress on private account. Since these works were commenced Illinois has more than trebled her population. She has now what she then lacked—population, wealth, skill, experience—all the elements necessary to success. To judge of the present from the past is reasoning from entirely different data. There is no parallelism between the two periods. Repudiation in Illinois was the result of necessity. Those who loaned her money ought to have foreseen this. They took the risk, and if it turned out unfortunate, they must thank themselves for their folly. With her increased strength she will soon resume the payment of her liabilities, and time is only wanting to give her securities as high a value in the market as those of Ohio.

Railroad companies in Illinois are as much entitled to credit as those of Ohio, provided they can make out as good a case, as far as means and pros-

pective business are concerned. The liabilities of Chicago are just as certain to be met as those of Cleveland. So with the other towns and counties in that State. Among her people there is no more disposition to repudiate than among those of Ohio or New York. In extending credits to the former the point to be considered is their *ability* not their *disposition* to pay. If the former point is satisfactorily made out, the latter will follow as a matter of course.

Illinois has now a population of 1,000,000. She equals any State in the Union in the extent of her resources, and as she is one of the largest in area, we think that she will eventually become the most populous. No interior State has such commercial advantages as this. None has so large a quantity of fertile soil, and none such a vast extent of coal fields. With all these elements of wealth why should not her public works attract attention, and receive the patronage and support of other parts of the country? We are confident that none are more deserving, and that none are more certain to yield a rich return upon the money invested in them.

Notice to Contractors.

COVINGTON & LEXINGTON RAILROAD.
Sealed Proposals will be received at the office of the Covington and Lexington Railroad Company, in the city of Covington, until the 10th day of September next, for grading twenty miles of the Covington and Lexington Railroad, commencing at Covington and extending up the valley of the Licking river. The proposals will include all the excavations, embankments, and masonry for culverts—also the masonry for bridges.

Plans and specifications of the work to be done, and the terms of payment, may be seen at the office of the company, at any time between the first and tenth of September.

SYLVESTER WELCH,
Engineer Covington and Lexington R. R.
Covington and Lexington Railroad Office,
July 21st, 1850.



EMERSON'S
PATENT
CORRESPONDING
VENTILATORS,

For Ships, Steamers, etc.,

Manufactured by



CHILSON, ALLEN, WALKER & CO.,
351 Broadway, New York.

Notice to Contractors.

SEALED PROPOSALS will be received at the office of the James River and Kanawha Company in Richmond, until the 1st day of October next, for the construction of the Piers and Abutments of the Bridges across James River at New Canton, Hardwickville and Bent Creek. This work will be paid for in cash. Besides the usual reservation of 20 per cent. on the monthly estimates, the contractor or contractors will be required to give ample security, satisfactory to the Board of Directors, for the completion of the work at the time and in the manner specified in the contracts.

Plans of the above works will be exhibited and specifications thereof delivered to the contractors at the office of John Couly, the Assistant Engineer in charge of the same in Columbia.

WALTER GWYNN,
Chief Eng. J. R. & K. Co.

August 16, 1850.

CUT NAILS OF BEST QUALITY, BAR IRON
(including Flat Nails) manufactured and for sale
by **FISHER, MORGAN & CO.,**
75 N. Water St., Philadelphia.

Great American Engineering

AND MECHANICAL WORK, just published in medium folio One Dollar, 75 cts. to Subscribers.
Part VII of "Specimens of the Stone, Iron & Wood Bridges, Viaducts, Tunnels, Culverts, &c., &c., of the United States Railroads." By George Duggan, Architect and Civil Engineer.

The present part contains beautifully executed plans, elevations, sections and details of the elegant timber Bridge, (Burr's Patent,) 150 feet span, across Salmon River, Malone, on the line of the Northern-Ogdensburg-railroad, and isometrical views of Bridges 30, 40 60, 82 and 98 feet span on the line of the Utica and Syracuse railroad, with specifications, form of contract, &c., &c., for the Connecticut River railroad.

"It is a work that was a great desideratum, and must prove of great benefit to the engineering profession generally, and especially to the tyro in practical engineering and mechanical knowledge; in truth it strikes us, that it would require years of labor and patient toil on the part of a young engineer to prepare the drawings, and collect the information that will be embodied in this work, and can now be secured for the trifling sum of \$9"—[Scientific Amer. March 16, 1850.]

In connection with this subject (Iron Railroad Structures) we take occasion to call attention again to Mr. Duggan's valuable and expensive publication, exhibiting drawings, with full descriptions of the various stone, iron and wooden bridges, viaducts, tunnels, culverts, etc., of all the Railroads in the United States. Mr. Duggan is an accomplished Architect and Civil Engineer, who came from Ireland to this country to exercise his profession; but finding Railroad construction here, in many respects, different from that he had been accustomed to in Europe, he applied himself to the study of our system; and the fruits of his researches and investigations embodied in this work, are well calculated to meet the exigencies of engineers, and to assist draughtsmen, bridge builders, mechanics and students.—[N. Y. Journal of Commerce, Feb. 14, 1850.]

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"PART VI. of Specimens of the Stone, Iron and Wood Bridges, etc., etc., of the United States Railroads," By George Duggan, Architect and Civil Engineer, contains specimens of the plates and letter press intended for the APPENDIX, being the commencement of a complete Treatise on the Theory and Practice of Bridge Building. This will be one of the most valuable works on the subject ever presented to the attention of engineers in this country—condensing the most important information on this branch of architecture contained in the writings of the most eminent scientific men in the French, German, Italian, and English languages, in the course of the last and present century. It will be illustrated by numerous accurate representations of bridges of the greatest celebrity in modern times. Elaborate articles will be given on the strength, property, and uses of the different materials employed, and on the most approved methods of constructing Cofferdams, Foundations, Centering, etc., with descriptions and drawings of the various engines and Machines that were found most useful in constructing the works, and a selection of such specifications as may be of service to the practical bridge builder. The sixth number treats of the Application of Iron to Railroad Structures, and is illustrated by beautiful drawings of the Bridge across the Delaware at Saw Mill Rift on the Erie Railroad, and of the bridge over Fairfield street, on the Manchester and Birmingham Railroad. The great success of this work thus far is the best tribute to its scientific merit and its adaptation to the wants of the American engineer."—[New York Daily Tribune, June 28, 1850.]

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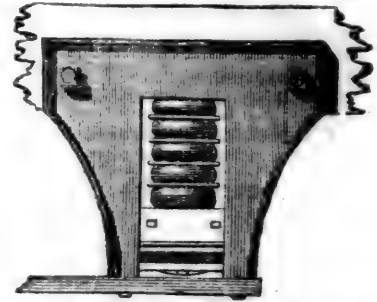
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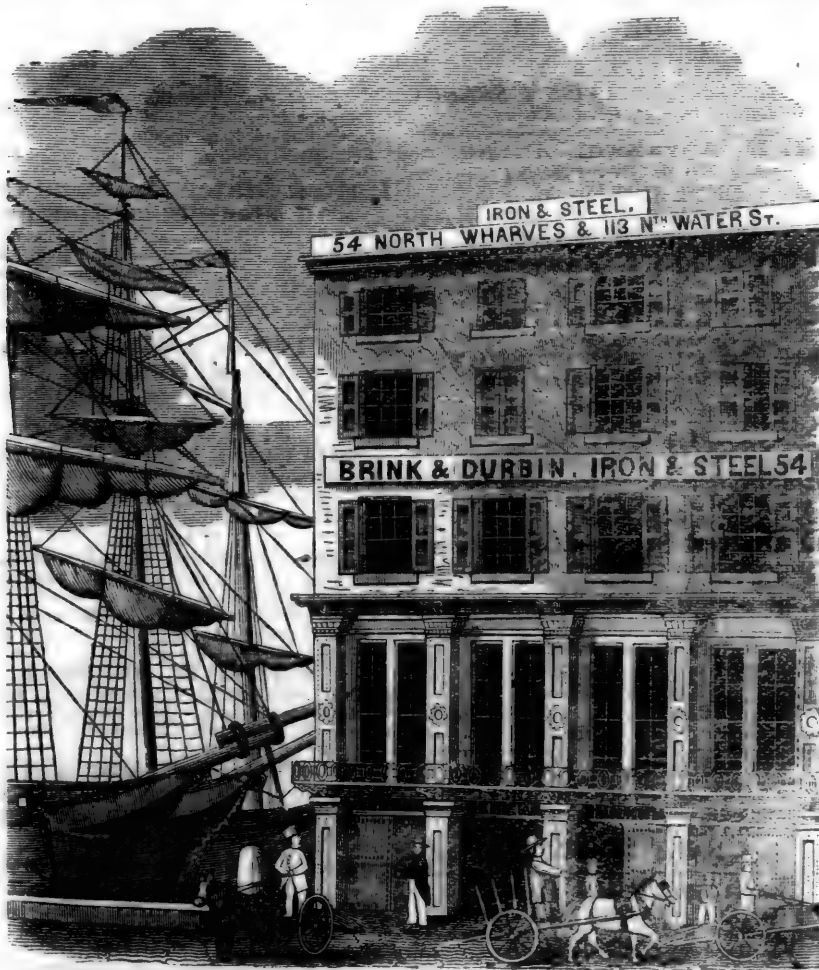
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73 New street,
New York.
February 3, 1849.

Iron Store.

THE Subscribers, having the selling agency of the following named Rolling Mills, viz: Norristown, Rough and Ready, Kensington, Triadelphia, Pottsgrove and Thorndale, can supply Railroad Companies, Merchants and others, at the wholesale mill prices for bars of all sizes, sheets cut to order as large as 58 in. diameter; Railroad Iron, domestic and foreign; Locomotive tire welded to given size; Chairs and Spikes for shunting, locomotive and general machinery purposes; Cast, Shear, Blister and Spring Steel; Boiler rivets; Copper; Pig iron, etc., etc.

MORRIS, JONES & CO.,
Iron Merchants,
Schuylkill 7th and Market Sts., Philadelphia.
August 16, 1849. 1y33

Railroad Iron.

THE MOUNT SAVAGE IRON WORKS, Alleghany county, Maryland, having recently passed into the hands of new proprietors, are now prepared, with increased facilities, to execute orders for any of the various patterns of Railroad Iron. Communications addressed to either of the subscribers will have prompt attention.

J. F. WINSLOW, President
Troy, N. Y.
ERASTUS CORNING, Albany
WARREN DELANO, Jr., N. Y.
JOHN M. FORBES, Boston.
ENOCH PRATT, Baltimore, Md.
November 6, 1848.

Railroad Iron.

THE SUBSCRIBERS ARE PREPARED TO take orders for Railroad Iron to be made at their Phoenix Iron Works, situated on the Schuylkill River, near this city, and at their Safe Harbor Iron Works, situated in Lancaster County, on the Susquehanna river; which two establishments are now turning out upwards of 1800 tons of finished rails per month.

Companies desirous of contracting will be promptly supplied with rails of any required pattern, and of the very best quality.

REEVES, BUCK & CO.
45 North Water St. Philadelphia.
March 15, 1849.

Monument Foundry.

A. & W. DENMEAD & SON,
Corner of North and Monument Sts.,—Baltimore,
HAVING THEIR

IRON FOUNDRY AND MACHINE SHOP

In complete operation, are prepared to execute faithfully and promptly, orders for
Locomotive or Stationary Steam Engines,
Woolen, Cotton, Flour, Rice, Sugar Grist, or Saw
Mills,

Slide, Hand or Chuck Lathes,
Machinery for cutting all kinds of Gearing.
Hydraulic, Tobacco and other Presses,
Car and Locomotive patent Ring Wheels, warranted,

Bridge and Mill Castings of every description,
Gas and Water Pipes of all sizes, warranted,
Railroad Wheels with best faggotted axle, furnished and fitted up for use, complete

Being provided with Heavy Lathes for Boring and Turning Screws, Cylinders, etc., we can furnish them of any pitch, length or pattern.

Old Machinery Renewed or Repaired—and Estimates for Work in any part of the United States furnished at short notice.

June 8, 1849.

Iron Wire.

REFINED IRON WIRE OF ALL KINDS,
Card, Reed, Cotton-flyer, Annealed, Broom, Buckle, and Spring Wire. Also all kinds of Round, Flat or Oval Wire, best adapted to various machine purposes, annealed and tempered, straightened and cut any length, manufactured and sold by

ICHABOD WASHBURN.

Worcester, Mass., May 25, 1849.

Wheel, Forge and Foundry Iron.

LOCUST GROVE Wheel Iron of great strength and superior chilling property.

Balt. Charcoal Forge Iron, from Patuxent, Curtis Creek and Gunpowder furnaces.

Elkridge Foundry Iron, of superior strength and softness. Anthracite and Charcoal Iron from Pennsylvania and Virginia. Gas and Water Pipes, Lamp Posts from Elkridge furnace.

LEMMON & GLENN,
62 Buchanan's Wharf, Baltimore.

**S. S. Keyser & Co.,
IRON WAREHOUSE,**

Corner of South and Pratt Streets,
BALTIMORE, MD.

Selling Agents for the Rough and Ready Bar Iron and Elk Boiler and Flue Iron Rolling Mills, Sarah and Taylor Furnaces, and Wrightsville Hollow Ware Foundry, and Dealers in Bar and Sheet Iron, and Cast, Sheer, German, Blister, Spring and Electroplated Steel, etc., etc.

Smith & Tyson,

GENERAL COMMISSION MERCHANTS,
No. 25 South Charles St., Baltimore, Md.

AGENTS for the Celebrated Columbia Pig Iron, suitable for Car Wheels and Chilled Rolls.
Columbia refined Charcoal Blooms; Refined Charcoal Juniatta Billet Iron for Wire; Refined Iron for Bridging, of great strength; Cut Nails, Spikes, and Brads; Railroad Spikes and Wrought Chairs. 22tf

**Stickney & Beatty,
DEALERS IN IRON AND IRON
MANUFACTURERS.**

AGENTS for the Balt. City Rolling Mill, from which establishment they are prepared to furnish Ellicott's round, square, and flat bar iron, puddled and charcoal boiler plates and billet iron—also agents for the sale of the Laurel and Maryland (Balt.) charcoal forge pig irons, Balt. hard iron for chilling wheels, anti-rattam nails, Catoctin foundry iron, boiler blooms from the Caledonian works, Wm. Jessop & Son's cast steel, Coleman's blister steel and nail rods, hoop, band, sheet, oval and common English iron.

No. 18 and 20 South Charles st., Baltimore.

Railroad Iron.

CONTRACTS made by the subscribers, agents for the manufacturers, for the delivery of Railway Iron, at any port in the United States, at fixed prices, and of quality tried and approved for many years, on the oldest railways in this country.

RAYMOND & FULLERTON, 45 Cliff st.

Iron.

THE SUBSCRIBERS having resumed the agency of the New-Jersey Iron Company, are prepared to execute orders for the different kinds and sizes of Iron usually made at the works of the company, and offer for sale on advantageous terms.—

150 tons No. 1 Boonton Foundry Pig Iron.

100 " No. 2 do. do. do.

300 " Nos. 2 & 3 Forge do. do.

100 " No. 2 Glendon do. do.

140 " Nos. 2 & 3 Lehigh Crane do. do.

100 " No. 1 Pompton Charcoal do. do.

100 " New-Jersey Blooms

50 " New-Jersey Faggotted Iron, for shafts

Best Bars, $\frac{1}{2}$ to 4 inch by $\frac{1}{2}$ to 1 inch thick.

Do do Rounds and Squares, $\frac{1}{2}$ to 3 inch.

Rounds and Squares, 3-16 to 1 inch.

Half Rounds, $\frac{1}{2}$ to 1 in. Ovals & Half Ovals $\frac{1}{2}$ to 1 in.

Bands, $\frac{1}{2}$ to 4 inch. Hoops, $\frac{1}{2}$ to 2 inch.

Trunk Hoops, $\frac{1}{2}$ to 1 in. Horse Shoe & Nut Iron.

Nail Plates. Railroad Spikes.

DUDLEY B. FULLER & Co., 139 Greenwich-st. and 85 Broad-st.

**WILLIAM JESSOP & SONS'
CELEBRATED CAST-STEEL.**

The subscribers have on hand, and are constantly receiving from their manufactory,

PARK WORKS, SHEFFIELD.

Double Refined Cast Steel—square, flat and octagon.

Best warranted Cast Steel—square, flat and octagon.

Best double and single Shear Steel—warranted.

Machinery Steel—round.

Best and 2d gy. Sheet Steel—for saws and other purposes.

German Steel—flat and square, "W. I. & S." "Eagle" and "Goat" stamps.

Genuine "Sykes," L. Blister Steel.

Best English Blister Steel, etc., etc., etc.

All of which are offered for sale on the most favorable terms by

WM. JESSOP & SONS,

91 John street, New York.

Also by their Agents—

Curtis & Hand, 47 Commerce street, Philadelphia.

Alex'r Fullerton & Co., 119 Milk street, Boston.

Stickney & Beatty, South Charles street, Baltimore.

May 6, 1848.

**JOHNSON, CAMMELL & Co's
Celebrated Cast Steel,**

AND

ENGINEERING AND MACHINE FILES,

which for quality and adaptation to mechanical uses,

have been proved superior to any in the United States.

Every description of square, octagon, flat and round

cast steel, sheet, shovel and railway spring steel, best

double and single shear steel, German steel, flat and

square, goat stamps, etc. Saw and file steel, and steel

to order for any purpose, manufactured at their Cy-

clops Steel Works Sheffield.

JOHNSON, CAMMELL & CO.,

100 William St., New York.

November 23 1849.

Railroad Iron.

THE Undersigned, Agents for Manufacturers, are prepared to contract for the delivery of English, Welsh and Scotch Rails, of any pattern and weight, also for every description of English, Welsh, Scotch, and Swedish Iron, Railway Chairs and Spikes, Rivets, Bolts, Nuts, Washers, Chain Cables, Anchors, Tin Plates, German Spelter, Iron Castings, and every description of Machinery.

WILLIAM BIRD & CO.,

Iron and Tin Plate Merchants,

44 Wall st., New York.

And at 5 Martin's Lane, City, London,

and 140 Buchanan st., Glasgow.

July 27th, 1850.

**To the Proprietors of Rolling
Mills and Iron Works.**

THE Undersigned—Proprietors of Townsend's Furnace and Machine Shop, Albany—are extensively engaged in the manufacture of Machinery and fixtures for Iron, and Copper Rolling Mills, and Iron Works. Having paid particular attention to the manufacture of *Rolls* (Rollers), both *chilled and dry*, and feel confident that they can execute orders for such castings in a satisfactory manner. And to give assurance of this, they beg leave to refer to the following named persons, proprietors and managers of some of the most extensive rolling mills in the country, viz: Jno. F. Winslow, J. Tuckerman, H. Burden, W. I. Artt, J. & J. Rogers, Salsus & Co., J. B. Bailey, L. G. B. Cannon, Hawkins & Atwater, etc., etc.

F. & T. TOWNSEND.

Albany, August 18, 1849.

Railroad Iron.

B. O. Railway Tires, Railway Wheels,
Scotch Pig Iron, Tin Plates and Banca Tin,
Muntz Patent Metal Sheathing,
Baltimore Copper.

Contracts for Rails made on behalf of the manufacturers, for delivery at any ports in the United States, at fixed prices.

Bowling Tires and Tire Bars and Scotch Pigs imported to order.

Muntz's Ship-sheathing, and a general stock of Tin Plates and Banca Tin in store, and for sale by

RAYMOND & FULLERTON, 45 Cliff st.

Bowling Iron. Stamped B.O.

Railway Tire Bars Rivet Iron
Locomotive and other Axles Locomotive Frame do
Boiler Plates Bars.

and every other description of this superior Iron.

The subscribers, agents for the sale of Bowling Iron, are prepared to execute orders for importation, especially for railway and machinery uses, with despatch from the manufacturers.

RAYMOND & FULLERTON, 45 Cliff st.

**Lovegrove's Patent Cast Iron
Water and Gas Pipes.**

THE Subscriber, the Inventor and Patentee of the Centrifugal mode of giving form to metallic substances while in a molten state, is preparing to make Cast Iron Water and Gas Pipes, of any dimensions, at prices much lower than they can be made in the old manner, and the pipes warranted to stand a pressure of three hundred pounds to the square inch, and to be soft enough to drill. Steam Engines and all kinds of machinery. Cast Iron Doors and Frames, and Mill Castings of every description, made to order.

THOMAS LOVEGROVE,

Machinist and Founder,

West Falls Avenue, below Pratt st., Baltimore.

**Ray's Patent India Rubber
Car Springs.**

Savannah, Ga., May 22, 1850.

Dear Sir: I have no hesitation in saying, after having used on our road your springs and Fuller's, that I consider yours decidedly the best in every particular, and in this opinion I am sustained by all our officers. Fuller's spring has a tendency to split, and also to chafe or abrade by the constant friction on the cast iron plates or disc: and in my opinion is not near so elastic as yours.

Your springs, which have been in use on our road for 12 or 15 months past, and in constant use under both passenger and freight cars, are to all appearances as elastic, sound and good, as when first put in use.

We are now building eighty-five new cars, of which for fifty-sets the springs have been ordered of you.

GEORGE A. ADAMS,

Master Carpenter,

Central Railroad and Banking Co. of Georgia.

Connecticut River Railroad Office, }
Northampton, May 4, 1850. }

E. CRANE, Esq.,

Dear Sir: It is now about two years since I first tried the experiment of using a set of Ray's India-rubber Springs upon one of our merchandise cars, and although the car has been in constant service since that time, I do not on examination find the slightest difference either in the thickness or elasticity of the material.

The same result has followed wherever we have applied them, either for wheel or draw springs on Engines, Tenders or Cars. At present we use no other; either in replacing old springs or building new cars—and I am perfectly satisfied that for economy, durability, safety, and ease of motion, that Ray's India-rubber is the best article for Springs which has been presented to the public.

Yours respectfully, J. HUNT,
Supt. Connecticut River Railroad.

EDWARD CRANE, Esq.,

Dear Sir: Having applied to cars of the Boston and Worcester Railroad Corporation, Ray's Vulcanised Rubber Springs (where they have been in use for some two years last past), I have had occasion to observe their operation, and am free to say in answer to your inquiries, that they retain their elasticity perfectly during all changes of atmospheric temperature; and are in my opinion a most valuable acquisition to Railroad Cars—are not liable to derangement, as is the case with steel springs; while at the same time it costs less to apply them. Respectfully yours,

D. N. PICKERING,

Supt. Motive Power, Bos. & Wor. Railroad.
Boston, April 15th, 1850.

FARMERS! ATTENTION!!**John Mayher & Co's****NEW AGRICULTURAL WAREHOUSE
AND SEED STORE,****197 WATER STREET, NEW YORK.**

Where they have for Sale, the largest and most complete assortment of Farming Implements, ever offered for sale in this city—all of which they will sell 10 per cent. Cheaper than the same kind of Goods can be bought at any other house in the city. Our Goods are all Warranted to give satisfaction.

FARMERS wanting to purchase, will please call and examine our Stock before buying elsewhere.

Among our assortment may be found the Celebrated Highest Premium Eagle Ploughs! together with all the most approved Ploughs now in use.

Also,—Horse Powers, Threshing Machines, Fan Mills, Corn Shellers, Straw Cutters, Corn Mills, Seed Sowers, Churns, Ox Yokes, Ox Scrapers, Hay Rakes, Horse Rakes, Patent Chain Pump (that never freezes nor rusts), and other Pumps; in fact we have everything for Farming Purposes—together with Guano, Bone Dust and other Fertilizers.

JOHN MAYHER & CO.,
197 Water st., N. Y.

February 9, 1850.

N.B.—J. M. & Co. also continue their Old Stand, at 195 Front street, near Fulton Market.

**RAILROAD CAR
AND COACH TRIMMINGS.**
Doremus & Nixon,
IMPORTERS AND FURNISHERS

HAVE FOR SALE

Plain Garnet Plush. Fig. Garnet Plush (Butterfly pat.
"Crimson" "Crimson" (Elegant.
"Scarlet" " " (Gen. Taylor.

BROCATELLES.

Crimson Silk Brocatelles. Gold and Maroon do.
Gold and Blue " " Brown "
Silk and Wool " of every color.

MOQUETTES,

Of elegant designs and colors.

GERMAN CLOTH FOR CAR LININGS.

The most beautiful goods ever shown in this country, and the subscribers are the sole agents for the sale of them.

Oil cloths Enamelled with Gold. These goods can be
" " Silver. furnished in any
Do. Silver ground velvet printed. dimensions req'd.

CURLED HAIR

Of every description and quality.

JNO. W. A. STRICKLAND, Agent.
New York, 1850. 1y16

**FOWLER M. RAY'S
Patent India-rubber Railroad
CAR SPRING.**

New York and Erie Railroad Shops.

Piermont, March 26, 1850.

This will certify that from practical experience in the use of Fowler M. Ray's India rubber Car Springs, I believe them to be far superior to any others now in use.

I have never known them to be affected by any change of temperature, as other Rubber Springs have been affected on this road.

I am at the present time repairing a Passenger Car that Mr. Ray and myself mounted with his springs about two years and eight months since.

The springs are at the present time as perfect, to all appearances, as when first applied to the car.

Respectfully yours,

HORACE B. GARDNER,
Foreman of the Car Shops.

Supt. Office N.Y. & H. R.R., }
New York, March 8, 1850.

This is to certify that we have used the Rubber Springs manufactured by Mr. F. M. Ray for the past twenty months, "both for Passenger and Freight Car Springs and Bumpers, and of different sizes," and have in every case given entire satisfaction, and I consider them the best spring now in use.

M. SLOAT, Supt.

Boston, March 5, 1850.

In answer to your enquiry about India-rubber Springs, I have to say that we have used them to a considerable extent on both freight and passenger cars, and also on several of our tenders; and I am very well satisfied that they answer all the purpose for which they are intended. I believe the India-rubber will soon supersede all other springs for cars and tenders.

Yours truly,

S. M. FELTON,
Supt. Fitchburg Railroad.

Office New Jersey Railroad Co., }
Jersey City, March 8, 1850. }

FOWLER M. RAY, Esq.,

Dear Sir: In answer to your enquiries respecting the operation of the Vulcanised Rubber Springs, purchased by our company from you some two years since, I reply that they are superior to any spring in use, (that I have either seen or heard of).

The improved form of your spring, consisting of a solid piece of vulcanised rubber with bands on the outside, is far superior to your first form, consisting of disks of rubber with metallic plates interposed.

The last named form was tried, if you recollect, at a much earlier period; and then was replaced by your last form.

I have no hesitation in saying that your springs have given entire satisfaction, and most cheerfully recommend them to railroad companies throughout the country for the following reasons:

- 1st. The cost is 30 per cent. less.
- 2d. Saving of weight on each car of 8 wheels from 700 to 800 lbs.
- 3d. Less care and attention is required, as they are not liable to get out of repair.
- 4th. A great saving is secured in the wear and tear of the cars and rails from their great elasticity.
- 5th. The freedom from noise.
- 6th. There is greater safety in case of accident, as they cannot be broken.
- 7th. The comfort of passengers is enhanced sufficiently to pay the expense, waiving all the other reasons that I have given.

Should this fail to satisfy any person enquiring, you are at liberty to refer to me, No. 150 Washington St., Jersey City. Yours respectfully,

T. L. SMITH, Supt.

New York, March 11, 1850.

I have used the Patent India-rubber Spring purchased of Mr. Ray, upon the cars of the New York and New Haven Railroad, and have found them efficient and economical; and when applied to the axles and draw springs, believe them to be quite equal to any in use. I have found a combination of these springs with a steel spring under the transom beam a very satisfactory arrangement, and am now using this plan in all new cars.

Yours respectfully,

ROBERT SCHUYLER.

February 25, 1850.

From practical observation of the use of the India-rubber Car Springs, manufactured and sold by your company, we are entirely satisfied in their application, and do not hesitate to recommend them as elastic, durable, requiring no repairs for years, and retaining their consistency during all extremes of weather. We have applied them for the past two years, and consider them superior for all railroad purposes.

Yours truly,

OSGOOD BRADLEY, Car Builder, Worcester.
T. & C. WASON, do. Springfield.
DEAN, PACKARD & MILLS, do. do.
DAVENPORT & BRIDGES, do. Cambridgeport.

Office of the New Jersey Railroad Co., }
Jersey City, March 7, 1850. }

This is to certify that we have had Mr. F. M. Ray's India-rubber Springs in constant use under our cars, and as Bumper Springs for upwards of two years, and they have in every way given perfect satisfaction.

The present form of spring we deem far superior to the form of Disk, having used both forms, although we have none of those made in Disks at present in use.

We take pleasure in recommending these springs to all railroad companies.

J. P. JACKSON, Vice Pres.

New Jersey Railroad and Trans. Co.

Roxbury, February 28, 1850.

In compliance with your request, I take great pleasure in stating the result of my experience in the use of "Ray's Patented Vulcanised India-rubber Car and Engine Springs." We have used them nearly two years, and never had one fail in any way. The cold weather does not affect them, as it has other rubber springs we have used.

With sixteen years' experience as superintendent of machinery on the Boston and Providence railroad, I take pleasure in saying that your springs are the best we ever used, or I ever saw used elsewhere. We have 20 cars rigged with some of which I can say that the springs are as good now as when first applied. I put 24 lbs. of the rubber under the forward end of one of our heaviest engines, taking off 250 lbs. of steel springs—it has been in use 18 months, and is in as good condition now as when first put under the engine.

Very respectfully yours,

GEO. S. GRIGGS,
Supt. of Machinery, Boston and Prov. R.R.

Fall River, February 2, 1850.

In answer to yours of the 20th ult. I would say that this company has for some 10 or 12 months past been using "Ray's India-rubber Springs." We have applied them to both passenger and freight cars with uniform success. They have invariably preserved their elasticity and consistency through all the extremes of weather; and we are now applying them whenever the steel spring fails. I am well satisfied that they are particularly adapted for railroad purposes.

Very respectfully yours,

GEO. HAVEN,

Supt. Fall River Railroad.

Jersey City, March 9, 1850.

This is to certify that the present form of Mr. F. M. Ray's India-rubber Car Spring I consider far superior to the form of Disk, having used both forms.

I take pleasure in recommending these springs to all railroad companies.

DAVID H. BAKER,

Foreman of Car Shop of N.J. R.R. & Trans. Co.

Harlem R.R. Depot, }

New York, March 7, 1850.

This is to certify that we have used Mr. F. M. Ray's India-rubber Springs for over eighteen months, and find them to be easy and durable, and recommend them to railroad companies as being superior to anything we have tried.

J. M. SMART,

Foreman at 42d St. Depot.

Old Colony Railroad Office,
Boston, March 6, 1850.

EDWARD CRANE, Esq.,

President New England Car Co.,

Dear Sir: In compliance with your request I would state that the Old Colony Railroad Compy have had in use upon their road, India-rubber Springs furnished by your company, for more than eighteen months past, during which time they have been extensively used under Passenger and Freight Cars, Locomotive Tenders, and for Drawer and Buffer Springs, with the most perfect success. The elasticity and consistency of the Rubber has never been unfavorably affected by either extremes of heat or cold—and from the experience which we have had in the use of Rubber Springs, I think them well adapted for railroad purposes—and therefore we have for some months past used Rubber almost exclusively, in all places where springs are required.

Respectfully yours, etc.,

JAS. H. MOORE,

Supt. O. C. Road.

Troy, February 27, 1850.

We have been using your India-rubber Car Springs for nearly two years—and we take pleasure in saying that in our opinion the rubber has to a certain extent already, and may eventually entirely supersede all other Springs for Railroad Car purposes. We now use it entirely for Draw Springs and Bumpers, considering it better and lighter than steel.

During our two years' experience in the use of it, we have not known any to lose their elasticity, or fail in any way; and we cheerfully recommend the rubber for railroad car springs.

Very respectfully,

EATON, GILBERT & CO.

Passenger Car Linings.

THE Advertiser continues to make to order the Enamelled Car Linings which have been so highly approved the last three years, and are now exclusively used by all the Northern Railroads. No pains are spared to get out new styles, and adapt them to the tastes of every consumer.

Orders addressed to CHARLES STODDER, No. 75 Kilby street, Boston, will have prompt attention.

March 23, 1850.

2m

India-rubber for Railroad Cos.

RUBBER SPRINGS—Bearing and Buffer—Fowler's Patent—Hose from 1 to 12 inches diameter. Suction Hose. Steam Packing—from 1-16 to 2 in. thick. Rubber and Gutta Percha Bands. These articles are all warranted to give satisfaction, made under Tyer & Helm's patent, issued January, 1849.—No lead used in the composition. Will stand much higher heat than that called "Goodyear's," and is in all respects better than any in use. Proprietors of railroads do not be overcharged by pretenders.

HORACE H. DAY,

Warehouse 23 Courtlandt street,

New York, May 21, 1849.

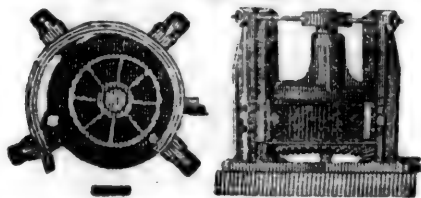
Spikes, Spikes, Spikes.

ANY person wishing a simple and effective Spik Machine, or a number of them, may be supplied by addressing

March 6, 1850.

J. W. FLACK,

Troy, N. Y.

MACHINERY.**Henry Burden's Patent Revolving Shingling Machine.**

THE Subscriber having recently purchased the right of this machine for the United States, now offers to make transfers of the right to run said machine, or sell to those who may be desirous to purchase the right for one or more of the States.

This machine is now in successful operation in ten or twelve iron works in and about the vicinity of Pittsburgh, also at Phoenixville and Reading, Pa., Covington Iron Works, Md., Troy Rolling Mills, and Troy Iron and Nail Factory, Troy, N. Y., where it has given universal satisfaction.

Its advantages over the ordinary Forge Hammer are numerous: considerable saving in first cost; saving in power; the entire saving of shingler's, or hammerman's wages, as no attendance whatever is necessary, it being entirely self-acting; saving in time from the quantity of work done, as one machine is capable of working the iron from sixty puddling furnaces; saving of waste, as nothing but the scoria is thrown off, and that most effectually; saving of staffs, as none are used or required. The time required to furnish a bloom being only about six seconds, the scoria has no time to set, consequently is got rid of much easier than when allowed to congeal as under the hammer. The iron being discharged from the machine so hot, rolls better and is much easier on the rollers and machinery. The bars roll sounder, and are much better finished. The subscriber feels confident that persons who will examine for themselves the machinery in operation, will find it possesses more advantages than have been enumerated. For further particulars address the subscriber at Troy, N. Y.

P. A. BURDEN.

Railroad Spikes and Wrought Iron Fastenings.

THE TROY IRON AND NAIL FACTORY, exclusive owner of all Henry Burden's Patented Machinery for making Spikes, have facilities for manufacturing large quantities upon short notice, and of a quality unsurpassed.

Wrought Iron Chairs, Clamps, Keys and Bolts for Railroad fastenings, also made to order. A full assortment of Ship and Boat Spikes always on hand.

All orders addressed to the Agent at the Factory will receive immediate attention.

P. A. BURDEN, Agent,
Troy Iron and Nail Factory, Troy, N. Y.

CHILLED RAILROAD WHEELS.—THE UNDERSIGNED are now prepared to manufacture their Improved Corrugated Car Wheels, or Wheels with any form of spokes or discs, by a new process which prevents all strain on the metal, such as is produced in all other chilled wheels, by the manner of casting and cooling. By this new method of manufacture, the hubs of all kinds of wheels may be made whole—that is, without dividing them into sections—thus rendering the expense of banding unnecessary; and the wheels subjected to this process will be much stronger than those of the same size and weight, when made in the ordinary way.

A. WHITNEY & SON,
Willow St., below 13th,
Philadelphia, Pa.

Brown's Old Established SCALE WARE HOUSE,

NO. 234 WATER ST., NEW YORK.

THE Subscriber, Practical Manufacturer of Scales of every description, respectfully asks the attention of Railroad Companies to his Improved Wrought Iron Railroad Track and Depot Scales which for strength, durability, accuracy, convenience in weighing, and beauty of workmanship, are not surpassed by any others in this country.

He is aware that this is rather a bold assertion for him to make, yet he can say with confidence that they have but to be tried to give them precedence over all others.

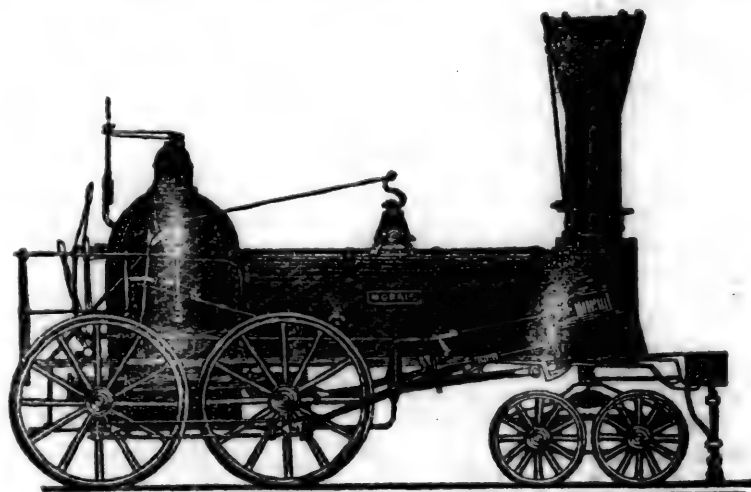
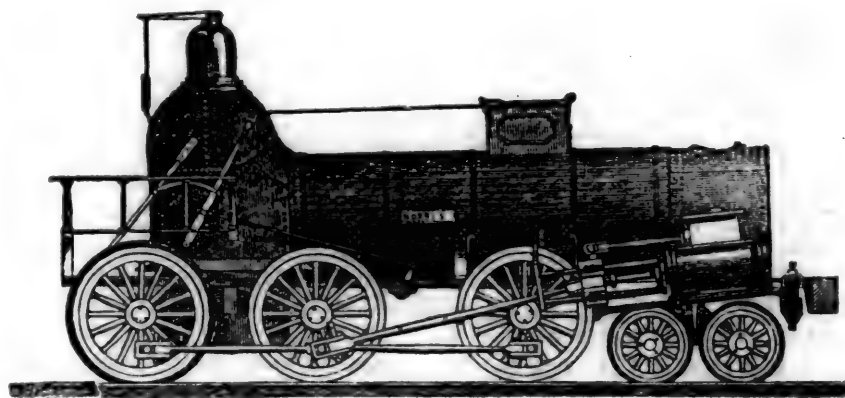
J. L. BROWN.

Bank Scales made to order, and all Scales of his make Warranted in every particular.

References given if required

NORRIS' LOCOMOTIVE WORKS.

BUSHHILL, SCHUYLKILL SIXTH-ST., PHILADELPHIA,



THE UNDERSIGNED Manufacture to order Locomotive Steam Engines of any plan or size. Their shops being enlarged, and their arrangements considerably extended to facilitate the speedy execution of work in this branch, they can offer to Railway Companies unusual advantages for prompt delivery of Machinery of superior workmanship and finish.

Connected with the Locomotive business, they are also prepared to furnish, at short notice, Chilled Wheels for Cars of superior quality.

Wrought Iron Tyres made of any required size—the exact diameter of the Wheel Centre, being given, the Tyres are made to fit on same without the necessity of turning out inside.

Iron and Brass castings, Axles, etc., fitted up complete with Trucks or otherwise.

NORRIS, BROTHERS

PATENT MACHINE MADE HORSE-SHOES.

The Troy Iron and Nail Factory have always on hand a general assortment of Horse Shoes, made from Refined American Iron.

Four sizes being made, it will be well for those ordering to remember that the size of the shoe increases as the numbers—No. 1 being the smallest.

P. A. BURDEN, Agent,
Troy Iron and Nail Factory, Troy, N. Y.

Etna Safety Fuse.

THIS superior article for igniting the charge in wet or dry blasting, made with DUPONT'S best powder, is kept for sale at the office and depot of

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AMERICAN RAILROAD JOURNAL.

STEAM NAVIGATION, COMMERCE, MINING, MANUFACTURES.

HENRY V. POOR, Editor.

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American Railroad Journal.

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Saturday, September 7, 1850.

Railroad Law of New Hampshire.

AN ACT IN AMENDMENT OF THE LAWS IN RELATION TO RAILROAD CORPORATIONS.

SEC. 1. *Be it enacted by the Senate and House of Representatives in General Court convened,* That no person shall be allowed to pass or be carried over any railroad in this state without first paying the customary fare, excepting the stockholders going to and returning from the annual or any special meeting of said railroad corporation; the directors, treasurer and clerk of said company on their own road, the superintendent and conductor of such road and such other roads as shall have a business connection and contract with such road, persons actually engaged in running the cars, in charge of baggage or in repairing the road, or persons in charge of freight forwarded by express, in pursuance of a contract with the corporation, or in charge of the mail, or accompanying their own freight on a freight train. Provided, however, that if any person shall apply to the president, superintendent, conductor, or ticket master of any road for permission to pass free, and it shall appear that

such person is poor or in misfortune, and unable to pay the usual fare, and that it is necessary such person should pass over the road, it shall be lawful for such president, superintendent, conductor, or ticket master to give such person a written permit to pass free over such road, and such permit may include the wife and the children of such poor person. A record of all such permits shall be made by the person giving the same, which shall at all times be open to the inspection of the stockholders, and a return thereof made at the annual meeting.

SEC. 2. It shall be the duty of the conductor on each railroad, immediately after the cars start on their road, to examine the tickets of the passengers to ascertain if all have purchased tickets, and examine the tickets of all persons entering the cars by the way, and if any person who is not hereby excepted is found who has no ticket, to require such person forthwith to pay the usual fare over such road, or such part of it as the person proposes to travel, and in case of neglect or refusal to pay, it shall be the duty of the conductor to cause the train to be stopped, and the person or persons so neglecting or refusing to pay to leave the train, and in case of refusal it shall be lawful for said conductor to use such force as may be necessary to remove such person from the train, and the conductor shall have the same power to command assistance in removing such person as sheriffs by law have when serving process, and under the same penalty in case of refusal. Any person refusing to pay the fare, and refusing to leave the train as aforesaid, shall be liable to a fine of ten dollars.

SEC. 3. Any conductor who shall refuse to perform the duties required of him by this act, or any president, director, superintendent, ticket master, or conductor who shall pass or knowingly allow any person to pass or be carried over their road, or furnish any person with a ticket to pass over their road in violation of the first section of this act, shall be punished by fine not less than ten dollars, nor more than one hundred dollars.

SEC. 4. Every railroad corporation in this state shall, in the month of August in each year, agree upon and fix their rate of tariffs of toll for the transportation of freight and passengers over their road. The toll shall be rated by the mile for each passenger, and by the ton per mile on freight, except timber, lumber, bark and wood, which may be rated by the thousand feet, or by the cord per mile. Such corporation shall, on the first day of September in each year, post up at all the stations and depots on their road, a copy of such rates or tariffs of tolls, and shall cause said copy to remain so posted through the year. They shall also post up a statement of the whole cost of freight per ton, thousand or cord, and the fare of each passenger over their road between the several stations on their own road, and between the stations on their own road and other roads for which they assume to execute any agency or joint contract, whether within or without this

state. Such corporation shall not for one year after the rates of toll are posted as aforesaid, or until after sixty days notice has been given, charge or receive any higher rates of toll, fare, or freight than shall be fixed upon and posted as aforesaid.

SEC. 5. Every railroad corporation in this state shall make and maintain all necessary cattle guards, cattle passes, and farm crossings, for the convenience and safety of the land owners along the line of their road, and in case the corporation and land owner cannot agree upon the place, number, or manner in which such guards, passes, or crossings should be constructed, the land owner may by petition apply to three disinterested justices of the peace, two of whom shall be the quorum, neither of whom shall be resident in the same town with the applicant, or who shall have been previously advised with by the petitioners in relation to the matter to be submitted, who shall notify the parties by giving each at least fifteen days' notice in writing of the time and place they will meet to consider said petition, and shall examine and determine the place or places where such passes, guards, or farm crossings, and the time in which the same shall be constructed, and make a report thereof in writing, and file a copy of their report with the town clerk of the town where such land is situated; and in case the corporation shall refuse or neglect for sixty days after the report is filed as aforesaid, and after the time fixed for building the same by said justices, to construct passes, guards, and crossings, agreeably to the report made as aforesaid, they shall be liable to a fine of five hundred dollars, and a fine of one hundred for each month they shall refuse or neglect to construct the same, after the expiration of the said sixty days. Provided, that the said justices to whom said land owner shall apply as aforesaid shall be selected as follows:—One by the land owner, one by the railroad corporation, and the third by the two first, selected as aforesaid; and if said railroad corporation shall refuse to select one of said justices, it shall be the duty of the selectmen of the town in which the land is situated to name the person in behalf of said corporation.—Provided, however, that the provisions of this section shall not apply in any case where the corporation have settled with the land owner in relation to such guards, passes, and farm crossings.

SEC. 6. That whenever any railroad company shall unreasonably neglect or refuse to establish reasonable and proper depots or stopping places for the public accommodation after being thereto requested, the persons aggrieved thereby may by petition represent their said grievance to the Governor, who shall refer the same to the railroad commissioners, and if said commissioners shall, after hearing the several parties, be of opinion that such railroad company have unreasonably neglected or refused to establish such depots or reasonable or proper stopping places, they shall in writing declare what such railroad company ought to do in the premises, and fix an order the time when the

same shall be done, and make their return to the Secretary of State; and if said company shall neglect or refuse to comply with such order they shall forfeit the sum of one hundred dollars for each and every month's neglect, to any petitioner for such accommodation who may sue for the same. The fees of said commissioners and other reasonable expenses of the petitioners shall be taxed by said commissioners, and in cases where they determine that such railroad company have thus neglected and refused to make such necessary accommodation for the public, the same shall be paid by such company, and may be recovered in the name of such petitioners by action for money laid out and expended.

SEC. 7. If the life of any person not in the employment of the corporation shall be lost by reason of the negligence or carelessness of the proprietor or proprietors of any railroad, or by the unfitness or gross negligence, or by the carelessness of their servants or agents in this state, such proprietor or proprietors shall be liable to a fine not exceeding five thousand dollars nor less than five hundred dollars, to be recovered by indictment to the use of the executor or administrator of the deceased person, for the benefit of his widow and heirs, one moiety thereof to go to the widow and the other to the children of the deceased; but if there shall be no children, the whole shall go to the widow, and if no widow, to his heirs, according to the law regulating the distribution of intestate personal estate among heirs.

SEC. 8. No contract between two or more railroad corporations for the use of their roads shall be legal or binding on either party unless such contract shall be sanctioned in writing by the railroad commissioners and approved by the Governor and Council. And in no case shall such contract be for a longer term than five years, and no such use of another road shall be allowed unless by contract in writing executed by both parties, and a copy filed with the Secretary of State.

SEC. 9. The treasurer and clerk of any railroad corporation in the state, except such whose road is connected with a railroad in some other state by the acts of two or more states, shall reside within this state, and all the books, papers, and funds of said corporation, with the foregoing exceptions, shall be kept therein, or shall provide for the payment of all dividends to the stockholders in this state at the place of business of the corporation in this state.

SEC. 10. The directors of every railroad corporation shall from year to year make report to the Legislature, under oath, of their acts and doings, receipts and expenditures under the provisions of their charter, which report shall be made in the month of May in each year, and shall contain full information upon the several items hereafter enumerated, to wit:—

Return of the capital stock; increase of capital since last report; capital paid in per last report; capital paid in since last report; total amount of capital stock paid in; funded debt per last report; funded debt paid since last report; funded debt, increase of, since last report; total present amount of funded debt; floating debt per last report; floating debt paid since last report; floating debt, increase of since last report; total present amount of floating debt; average rate of interest per annum paid during the year; maximum amount of debt for each month during the year, viz:

January, February, March, April, May, June, July, August, September, October, November, and December.

Cost of Road and Equipment.—For graduation and masonry per last report; for graduation and masonry paid during the past year; total amount expended for graduation and masonry; for wooden bridges per last report, for wooden bridges paid during the past year; total amount expended for wooden bridges; for superstructure, including iron, per last report; for superstructure, including iron, paid during the past year; total amount expended for superstructure, including iron; for stations, buildings, and fixtures, per last report; for stations, buildings, and fixtures paid during the past year; total amount expended for stations, buildings, and fixtures; for land, land damages, and fences per last report; for land, land damages, and fences paid during the past year; total amount expended for land, land damages, and fences; for

locomotives per last report; for locomotives paid during the year past; total amount expended for locomotives; for passenger and baggage cars per last report; for passenger and baggage cars paid during the past year; total amount expended for passenger and baggage cars; for merchandise cars per last report; for merchandise cars paid during the past year; total amount expended for merchandise cars; for engineering per last report; for engineering paid during the past year; total amount expended for engineering; for agencies and other expenses paid during the past year; total amount expended for agencies and other expenses; total cost of road and equipment.

Characteristics of Road.—Length of road; length of single main track; length of double main track; length of branches owned by the company, stating whether they have single or double track; aggregate length of sidings and other tracks, excepting main track and branches; weight of rail per yard in main road; weight of rail per yard in branch road, specify the different weights per yard; maximum grade, with its length, in main road; maximum grade with its length, in branch roads; average grade per mile of main road; total rise and fall in the main road; total rise and fall in the branch roads; shortest radius of curvature, with length of curve, in main roads; shortest radius of curvature, with length of curve, in branch roads; total degrees of curvature in main road; total degrees of curvature in branch roads; total length of straight line in main road; total length of straight line in branches; aggregate length of wooden truss bridges; aggregate length of all other wooden bridges; aggregate length of stone and iron bridges; whole length of road unfenced on both sides; number of public ways crossed at grade; number of railroads crossed at grade; remarks; way stations for express trains; way stations for accommodation trains; flag stations; whole number of way stations; whole number of flag stations.

To be continued.

Probable Future Substitutes for Coal, &c.

We have a confident hope, however—or rather a firm belief—that long before our coal fields are really exhausted, discoveries will be made, both of new motive powers and new sources of heat and caloric, which will make all future generations independent of those clumsy and dingy resources.—Motive power, we think, will probably be supplied, either directly by such omnipresent and inexhaustible elements as electricity and galvanism, or by the employment of some gas, far more elastic than steam, and capable of being called into action, and again condensed by slight mechanical impulses, or by changes of temperature, incalculably less than are now necessary for the management of that comparatively intractable substance; but, even if we should still require to use steam, we are persuaded that means will be devised for its generation, or rather for the production of evolution of heat for that and all other purposes far less operose, indirect, and precarious, than the combustion of coal. This may probably be effected without any process of combustion at all; either by the great agents of galvanism or electricity already referred to; or by the friction, hammering, or rolling of solid and practicable indestructible bodies; or by the forcible compression of common air, or of other elastic fluids, or by the chemical combination of different substances; while, if combustion must still be resorted to, might it not be constantly maintained without the tremendous expense of the working and transportation of fuel, by merely contriving a method of burning the inexhaustible, omnipresent, and eternally reproduced element of *hydrogen*, as it exists in the great ocean, and in all our lakes, rivers, fountains, and tanks, and tubs of rain water, with the equally omnipresent, inexhaustible, and constantly reproduced *oxygen* of the circumambient atmosphere. These, we are aware, may now strike many (perhaps most) people as mere Utopian or Laputan facies; and undoubtedly they are, as yet, but vague and general suggestions. But when we consider how much wilder and more audacious (as less warranted by any analogous experience) similar anticipations of electric telegraphs, photographic painting, or railway locomotives, must have appeared but 50 years ago, we really cannot consent to

put them in such a category; but, on the contrary, confess to a certain feeling, both of pride and confidence, in thus recording what we cannot but consider as a truly prophetic, though it may be but a dim and somewhat indistinct vision of a good and glory to come.—*Edinburgh Review.*

Oxygen.

Continued from page 516.

The generalising of facts, and the reducing practice into science, is, and should be, the aim of every true philosopher, but we raise our voice against the morbid over-anxiety which leads us to accept a theory upon data that after-experience shows are at least uncertain, if not positively unsound. We cannot object to guesses, provided they are borne in mind as guesses merely, and are not laid down and accepted as demonstrations; but we confess we have but little patience with those teachers who take up a plausible theory, say, "it is," when they should only, "it may be," and for no other reason than that it is the fashion to be dictatorial, and that they hope by these means to pass themselves off for such great wisacres, that nature's most hidden mysteries are all open to their lack-lustre eyes. They, forsooth, know all about it—"certainly," say they, "it does appear strange to the uninitiated, but just try a dose of our theory, it will so brighten your wits and open your eyes! There, place two marbles—the harder the better—side by side; take care they do not even touch—cry, 'Hey, Presto!' that is our chemical combination." We certainly prefer a child's idea of the manner in which two fluids, as whiskey and water, are said to mix—and think such a notion of what is admitted to be merely a mixture, coincides much better with the idea of chemical combination, than the lump upon lump theory which has resulted from the prolonged labors of many most ingenious men—whose work, despite their talent and perseverance, we can only regard in the same class as highly elaborate automata, intricate examples of ingenuity misapplied and incomprehensible to all who have not been trained up to the craft. It would almost seem that one of the first principles of morals had been found inapplicable to science, and that, in such a manner, it was right to do a little wrong that good might come. Much of the modern chemical theory rests on a good foundation, but is an unfinished superstructure. To have exhibited the incompleteness of the building would have incited others to the task, but alas! it would also have shown the theoriser's ignorance; they have therefore built "castles in the air," whose hollow paper walls awe the multitude by an imposing aspect, and, upon close inspection, present an excellent example of the skill of the contrivers in an elaborate arrangement of patchwork. We do not come prepared with a theory that shall supersede the present one. We know where the shoe pinches, and are willing to admit, that we are neither shoemakers nor cobblers, to know how to remedy the defect. We therefore cry out when we are hurt, and are not disposed to agree with those who say, "Do not meddle with what you have got—even if it pinches rather too tight—unless you can produce a better." On the contrary, we think we are really forwarding the cause of truth by saying—"Here is a difficulty, who will help to remove it? Our dissuaders would say—actively or tacitly—"Get away with you! though we are in a mess, yet we would rather continue to be entirely dirty than partially clean." So would not we, but would always take half a loaf when we could not get a whole one, and rather than be without any.

In any inquiry where truth is sought, we hold that doubts, as well as faith, should be discussed. If we cannot arrive at a satisfactory conclusion, let us seek more and clearer evidence; but if we would be honest judges, let us have no decision where the evidence is inconclusive, or the question has not been seen on all sides. Better to say—"We cannot tell," and frankly admit that we do not know that which is hidden, than to say—"This is right," when after proofs may upset our hasty judgment, and posterity point to our sapient selves, exclaiming—"These are our Solon forefathers, who undertook to settle what they did not understand."

We cannot better illustrate the dangers and progress of hypothesis, than by giving the history of oxygen, both when ill treated and stifled by its ri-

val, phlogiston, and when discovered and almost restrangled by Priestley. "What man has done, man may do." So said our schoolmaster; and it will apply as the moral we would wish the following short history to inculcate, if we interpret the phrase in a way our "dominie" did not exactly intend, by saying—"Speculative men have made many mistakes, and speculative men will most probably do so again." In our compilation, we have borrowed freely from the works of Thompson, Brand, Turner, and Fourcroy.

The first idea of the phlogiston theory is ascribed to John Joachim Becher. He was born at Spire, in Germany, in 1635, and, by a succession of intrigues, was driven from Munich to Vienna, thence to Haerlem, and eventually, in 1680, to Britain, where he examined the Scotch and Cornish mines and smelting, and died after a few years' residence. The development and nomenclature of the theory are due to George Earnest Stahl, born at Anspach, 1660, and died 1734. He contributed so greatly to its success, both by his reasoning and experiments, that although it originated with Becher, yet it was commonly called the Stahlian theory. According to this theory all combustible bodies are compounds, one constituent being set free and dissipated by combustion, the other being fixed and remaining. Those bodies which will not burn were said to have previously undergone combustion. This quicklime possesses properties very similar to the calces of the metals, *i. e.*, the products of their combustion, and it was very naturally supposed to be also a calx, and that, if the matter dissipated during its combustion could be restored, lime would be converted into a metal.—Combustibility was therefore thought to be dependant upon an igneous or fiery principle, or material substance, which was present in every combustible body, and whose separation constituted the phenomenon of combustion. This substance was considered to be absolutely the same in every combustible, their individual peculiarities resulting from the other principle, or number of principles, with which this common fire principle was combined. For this common principle Stahl invented the name Phlogiston, and in proof of the theory he adduced experiments which appeared so decisive and incontrovertible, and were stated with so much force and clearness, that the idea was received almost by acclamation, and the dissentients found themselves in so small a minority, that most lost courage to express their dissatisfaction, and thus tacitly sanctioned its reception. The experimental proofs, and theoretical deductions, were as follows:—When phosphorus is burnt in a glass vessel, the white smoke produced during the combustion is deposited on the glass, and quickly absorbing moisture, deliquesces into an acidulous liquid, known as phosphoric acid. This liquid, placed in a platinum crucible, and gradually heated to redness, parts with the water, and leaves dry phosphoric acid, which is colorless and transparent, like glass. If a quantity of charcoal is mixed with this phosphoric acid, and the whole reheated in a close vessel, a portion, or the whole, of the charcoal will disappear and phosphorus will be found, in every way identical with that burnt in the first instance. The conclusion deduced from this appears to be inevitable—the charcoal had combined with the phosphoric acid, and the union of the two bodies constituted phosphorus. To corroborate their views, the advocates of the phlogiston theory appealed to the action of nearly every inflammable substance. They showed that a similar effect was produced by lamp-black, sugar, resin and flesh, and also by the more easily oxidised metals, as zinc, and that in every case the mixture of a combustible with phosphoric acid produced phosphorus. Hence it appeared to be a necessary consequence, that all combustibles possess one common principle, which they communicate to the phosphoric acid; for as the body formed by the action of each combustible is, in all cases, identical, and, moreover, as one combustible produces another—as, in the foregoing instance, charcoal produces phosphorus—therefore the principle communicated by, and necessarily a constituent of, every combustible, must be identical also; and that supposed principle was named phlogiston. The theory was also argued by the aid of all similar phenomena. Sulphur, by burning, is converted into sulphuric acid, and if it is then heated with

charcoal, sulphur is reproduced. Who could deny the inference—that the combustible or phlogisticated substance imparted its phlogiston to the burnt or deplogisticated substance or material and thus reproduced the original phlogisticated compound? Again: tin at a red heat becomes converted into a calx. "By this process," said the phlogistians, "the tin becomes deplogisticated, and when we wish to reproduce the metal, we have only to add phlogiston to the calx which has been deprived of it. This we do by heating it with any combustible body; and it is indifferent whether we use wood, peat, coal, charcoal, leather, hair, sugar, flour, horn, &c., all will equally reproduce the tin, and must therefore all communicate the same substance to it—that substance is phlogiston." But there was a difficulty in the way, and though it appeared to be the only one, yet it finally overthrew the theory; and it is remarkable, that the fact which formed the wrecking rock, should have been observed and recorded many years before the well-pleaded theory had been framed.

In 1630, Jean Rey, a physician at Bugue, in Perigord, France, published his investigation of a circumstance referred to him by Le Bran, who found that 2 lbs. 6 oz. of tin, kept at an elevated temperature for six hours, had passed into the state of calx, and then weighed 3 lbs. 1 oz.; that is, deplogisticated or burnt tin is heavier than phlogisticated or unburnt metallic tin. Rey thus sums up the result of his labors:—"To this question, then, supported on the grounds already mentioned, I answer, and maintain with confidence, that the increase of weight arises from the air which is condensed—rendered heavy and adhesive, by the violent and long-continued heat of the furnace. This air mixes itself with the calx—frequent agitation conducting—and attaches itself to the minutest molecules, in the same manner as water renders heavy sand which is agitated with it, and moistens and adheres to the smallest grains. This difficulty—the increase of weight consequent upon deplogistication—was met by assigning a peculiar property to phlogiston. It was supposed to be not only destitute of weight, but absolutely endowed with the property of levity. A body containing phlogiston was said to be lighter than it otherwise would be, and became heavier when the phlogiston made its escape. Thus, the increase of weight in the calcined tin was not owing to the fixation of air, but to the escape of phlogiston—in other words, of so much lightness. This sophism of the phlogiston chemists upon the property of levity, is only equalled by the speculation of a very sanguine inventor, who, instead of considering the comparative lightness of hydrogen—the lightest substance known, the gas frequently used for filling balloons—ascribed it, after the same logical manner, to the innate property of levity, and in sober earnest, proposed to condense a balloonful into a vessel to be contained in his hat, which, when thus endowed with all the levitating powers of the balloon, was to be strapped to his shoulders. Thus equipped, off he was to fly—we suppose—to Gulliver's Island of Laputa, the happy abode of tremendous geniuses, where he was to be met by his near relation, who would condense into his snuff box sufficient air to float him conveniently on the water, put his box in his waistcoat pocket, "walk the waters like a thing of life," and feed during the voyage upon "the quintessence of dinner lozenges" commodiously packed in a pill box. It must be remembered, that upon this circumstance, the increase of weight by combustion, rests the proof of the part performed by oxygen. If charcoal combined with phosphoric acid to form phosphorus, the phosphorus should in such an event weigh as much as the united weights of the charcoal and acid. This is not found to be the case, but, on the contrary, it is considerably lighter. It is also ascertained, that when charcoal and phosphoric acid are heated together, a gas is evolved—invisible, and therefore very likely to escape notice—which, when collected, is found to weigh as much as the charcoal and the weight lost by the phosphoric acid; the loss being also exactly equal to the weight gained by the original combustion of the phosphorus, and its conversion into phosphoric acid. Hence the moderns conclude, that phosphorus, in burning, combines with a gas (oxygen), and therefore becomes just as much heavier as the gas weighs with which it combines.

When the acid is heated with charcoal, it is decomposed, the oxygen unites with the charcoal to form an oxide of carbon—also a gas—and the phosphorus remains, of the same nature, quantity, and weight as before combustion. So far as this goes, we think it clearly proved; and much as we may be inclined to doubt, in this instance we can scarcely agree with Abraham Tucker, as quoted by Bulwer in the *Caxtons*, though—like many other advice-givers, who recommend more than they appropriate—we think his works are worthy of the best consideration of all strongly-opiniated persons.

"Well persuaded as I am that two and two make four, if I were to meet with a person of credit, candor, and understanding, who should sincerely call it in question, I would give him a hearing; for I am not more certain of that than of the whole being greater than a part, and yet I could myself suggest some considerations that might seem to controvert this point." One grave objection to the modern theory is the absence of all recognition of heat, light and electricity, as *essentials* in the various phenomena. They are always present, and frequently are obviously necessary; can it then be possible for that theory to be correct which barely recognizes their existence? We think not; and our own inability to frame a theory which, in strict accordance with facts, shall embrace the whole of these phenomena, does not prevent our acknowledgement of ignorance, but most certainly will enhance our gratitude to him who can grasp the subject with such a master hand as to discover and lay bare the wondrous laws by which nature rules the endless combinations of the material world.—Our gratitude is also due to every one who advances us a single step towards truth. We honor the recorder of a simple fact, especially if it be opposed to a favorite theory; and therefore shall first enumerate some of those who, though in the merest twilight of theory, were yet content to curb their imaginations by the evidence of their senses, and who practised the philosophic precept—"facts not fictions." We shall then speak of oxygen and its discovery, and conclude with a short notice of the architect of much of the modern theory of combustion and acidification.—*Prac. Mech. Journal.*

On Determining the Capacity of Vessels.

Mr. Peck, naval constructor at Charlestown, Mass., has discovered an ingenious mode of determining the capacity of vessels; and its approximation to the actual displacement of government and ordinary freighting ships renders it valuable; its ready application to such vessels as have had their displacement calculated, will enable the reader to test its accuracy. Adapted, as it is, to almost all descriptions of freighting vessels; very sharp vessels, and particularly our sharpest ocean steamers, are exceptions to the general rule, having a smaller displacement than the rule would give, owing to their having no dead rise, and an easy bilge. The rule is as follows: From 90° deduct the angle of the floor, or the degrees of dead rise; .0075 the quotient is the decimal of capacity—multiply the length by the breadth, and that product by the depth, from the bottom of the garboard to load-line, and the last product by the decimal of capacity, and divide by 35, the quotient in tons. Thus assuming a ship to be 160 feet long, 35 feet wide, and from the bottom of the garboard to load-line, 14 feet deep, with four degrees of dead rise, we have—

	Decimal of			
	capacity.	Lgh.	Bth.	Depth.
90° = 86°	× .0075 = .645	160	× 35 = 5600	× 14
				Cubic feet
	Exponent:		per ton.	
	= 78400 × .645 = 50568	+ 35 = 1444	capacity in	
			tons.	

The principal, and, perhaps, the only difficulty in applying this rule as a standard of measurement, is its liability to evasion (which is the most objectionable feature in the present law.) The load-line could not be marked a proportionate distance from the base line, or from the plank-shear, without exposing the law to the same amount of infractions the present one is. But as a ready rule for general reference and approximating the truth, Mr. Peck's rule is, doubtless, without a rival. After the actual displacement has been found, a very

convenient method of obtaining the capacity will be found in the following: Multiply the length between perpendiculars by the breadth, that product by the depth from base to load-line, this last product divided into the whole displacement, and the quotient will furnish the exponent of the ratio of capacity, and will apply equally well to all descriptions of vessels.—*Marine and Naval Architecture.*

English Iron Trade.

The usual quarterly meeting of ironmasters took place at the Town Hall, Birmingham, on Thursday, and was more numerously attended than any meeting held for a considerable time past. The depression throughout the past three months has been great, and the workmen and their families have suffered much privation, but a better state of things is now confidently looked forward to. A number of furnaces were set to work during the railway mania, and the large amount of capital invested prevented the curtailment of the manufacture; upon the demand ceasing, a glut was the consequence, with a diminution in price. Several attempts have been made during the past quarter to effect a reduction below the quotations of last quarter-day, but without success. At the meeting, all the large firms in Staffordshire and Shropshire were represented, and many buyers from London and Liverpool were present. But few sales were effected, owing to the leading firms refusing to accede to any reduction of price; it being generally admitted that, without a great reduction of wages, which they were not prepared to recommend, forge pig iron could not be made for less than £3 per ton, nor manufactured for less than £6. Reports from Wales and Scotland were rumored, stating that in those localities prices were receding, but it would be folly for the manufacturers of South Staffordshire to attempt to compete with them in prices, while they beat them in quality. To meet the present condition of the trade, 20 furnaces have been blown out during the past three weeks; 2000 tons a week less than the usual supply will be thus produced, and the stocks lessened. Some sales were negotiated before the close of the meeting at £5 10s. to £5 15s. for bar, and £2 10s. to £2 15s. for pig—prices, at present wages, not considered remunerative. Rod and sheet iron brought £8 per ton. A general opinion prevailed that things had reached the worst, and we are glad to state that the accounts were all satisfactorily settled.

The quarterly meeting at Wolverhampton was held on Wednesday, but nothing of importance transpired, as the masters were waiting for the larger meeting at Birmingham. Few orders were given, but many considered that the trade gave indications of greater firmness.—*Min. Jour.*

Noiseless Carriage Wheels and Horse Shoes.

In the *Mining Journal* of July 22, 1848, we noticed the introduction of some improvements in the construction of wheels for carriages, by Mr. Andrew Smith, the patentee of the wire-rope machinery, which were likely to prove of much value to the public, as not only adding greatly to comfort in travelling over paved streets, from their being perfectly noiseless, but from their combining a much greater degree of safety. The principle consists in forming the hoop or tire of two separate layers of galvanised iron, which are rivetted together, and re-galvanised in the mass; this division of parts cutting off all vibration when travelling over the roughest stones. Mr. Andrew Smith has also applied the principle to springs, in which each plate is galvanized separately, and can never rust. The axle is also made to fit the axle box with perfect exactness, by a lining of fusible metal, is itself lubricating, and not liable to heat; the whole in conjunction secures a degree of quiet, ease and safety hitherto unattained. We have been led again to notice these ingenious improvements, from the fact that the patentee having produced a noiseless carriage, found that the horses' feet made more noise than ever, and seeking for a remedy has applied the same principle to the horse shoe. This is effected in the most simple manner, by making the shoes in two thicknesses of galvanised metal, then rivetting them together, and re-galvanizing. A horse equipped in these pumps trots over the gran-

ite streets of London as softly as if he was on a bowling green.—*London Min. Jour.*

MEMOIR ON THE PHYSICS OF THE MISSISSIPPI RIVER. BY CALEB G. FORSHEY, C. E.

1. *Rate of Fall.*—From the mouth of the river to a point 400 miles up its tortuous channel,* is a distance in a right line of only 220 miles. Its length is nearly double the right line distance. For 300 miles above New Orleans, it may, for practical purposes, be regarded as twice the distance of the right line.

2. The mean depth of the river at high water mark is not materially different at Natchez, from Carrollton, though near 300 miles apart. A section of the river at Carrollton, made at high water of 1849, is 168,226 square feet; and at Vidalia (opposite Natchez) the section is 167,000 feet. The bottom of an uniform channel 400 miles up, is about on a level with the bar at the southwest pass. The rate of fall is not uniform on the surface, but decreases in declivity towards the gulf, giving a curve of inclination (probably parabolic) to which the gulf level is a tangent, at the Balize. The mean rate of inclination is 1.80 inch per mile, for the first hundred miles, 2.00 inches the second hundred, 2.30 inches for the third, and 2.57 inches for the fourth hundred miles. Above this point I have no accurate data, but am inclined to think that the rate is not materially different, to the upper extreme of the Delta above the mouth of the Ohio.—These data relate to high water.

3. The low water curve of declivity has a mean descent of .24 inch per mile for the first hundred miles, and .50, .83, 1.20 in. for the next consecutive three hundred miles; making the total difference of level 21.1 feet, from a point ten miles above Natchez, to the Balize.

4. These rates are not uniform for short distances, interrupted as the channel is by many short bends which arrest the current's regular flow, and make a series of comparative levels and falls in the surface current. The means obtained are from levels made of segments of the channel, 25, 28, 16, and 100 miles in length, and are, I think, reliable.—They are, at least, the best data within my knowledge.

5. *Depth of Water.*—Within the 400 miles treated, the depth of the river at high water is not materially different. Near Natchez, I found an extreme depth of 188 feet, and a like depth has been found at several points in the vicinity of New Orleans.

One depth of 187 feet was recently found near Shrewsbury, about ten miles above the city. These are extreme cases. When the channel is distant from both shores, 125 feet is the usual maximum. A section made in front of Vidalia, half a mile below the Natchez ferry, gave a mean depth of 80.5 feet, with a maximum of about 130! and a like section of high water channel at Carrollton gave a mean depth of 71.6 feet. The low water depth may always be obtained by subtracting the range from the high water. At Vidalia, the range is 51 feet; and at Carrollton 15 feet. The mean depth of the low water sections would then be 29.5 feet and 56.6 feet. And the sectional areas at low water give 133,010 square feet for Carrollton, and 108,000 at Vidalia.

6. The channel continues to maintain a great depth, down to a point very near the debouchure. How near, I know not, but certainly beyond the head of the passes. At Port Jackson it is 136 feet deep, and a point midway down the southwest pass was found 102 feet.

7. *Width.*—The uniformity of breadth in the channel is a remarkable feature of the Mississippi river. A great number of measurements made by myself, from the Balize to Galena, 1700 miles up the river, give a mean width, including wide places in the bends of about 1000 yards; excluding these 800 yards; and the upper portion of this is wider, including expanses produced by bends and islands, than 1000 yards; but excluding them, they are the same. The addition of the four great rivers below make no increase in the breadth of the river. The

* As almost all of the material of this memoir was accumulated, prior to the cut-off made at Rac-courci bend, the distances are taken round the old channel.

Missouri at Booneville, 300 miles above its mouth, I found a half a mile wide.

It appears, from these facts relating to the width of the Mississippi, that it does not follow the law of confluent streams, as given in the books.* We shall have occasion to see that in many other features it is a river *sui generis*.

8. *Velocity of Currents.*—To obtain the surface velocity of the river, I have established parallel sights, transverse to the river, and with an assistant at one of the stations, timed floating drift wood, on still days, at all parts of the surface, estimating by the eye their distance from shore. This I have done at all stages of water, and derived the mean of each set, to the number of many hundreds of observations.†

9. The result shows a mean surface velocity at high water of 2.61 miles per hour, at Carrollton, and 2.60 miles per hour at Vidalia; respectively, 3.80 and 3.82 feet per second of time. The one was derived from 176 observations, and the other from 70 observations. At low water, Carrollton, 1.45 miles per hour, or 2.11 feet per second; at Vidalia, 1.54 miles per hour, or 2.25 feet per second.

10. The mean velocity for mean water, as derived from 30 years' observation, is 2.26 miles per hour, or 2.95 feet per second.

11. The velocities at various depths are not easily obtained. The irregularities of bottom and sides in the channel, and their continually shifting nature, give so many lateral and vertical directions to portions of the current, as very much to equalise the current velocity at all depths. Besides, the largeness of the volume renders friction much less influential than is usually computed for flumes. Accordingly, in sounding, I have found the lead, when thrown in great depths, to be drifted down stream as fast as the boat from which it was thrown, so that my soundings were made vertically, by letting the boat drift while the lead was descending.

I have allowed, with some hesitation, one eighth for retardation from friction, which is 12½ instead of 15 per cent., the rate usually allowed. This is a liberal allowance at high water, but at low water it is small enough, as we shall probably see.

12. It is remarkable that the high water sections at Vidalia and Carrollton, 275 miles apart, should be the same; but much more remarkable, that observations should have given so precisely the same mean velocity, 2.60 and 2.61 miles per hour. This is what should have been expected from observations of the utmost exactness on the hypothesis I assume, that the Atchafalaya, Lafourche, and Plaquemine carry off as much as Red River introduces.

13. *Rise and Fall of the River.*—The range of the river is, at Vidalia, as above stated, 51 feet; at Carrollton 15 feet. These are the extremes not often reached. In 1829 and in 1819 the river was 51 feet below the mark of 1828, and this latter mark is the highest for 30 years, at all known points on the river, up to the year 1849, when the water reached in several places the same point as in '28. In 1815 the water rose at Vidalia two inches higher than in 1828, and was said to be the highest water since 1770. Mr. Hutchings thinks the water mark was made in 1770, which was still visible in his recollection, fully one foot higher than

* "Assuming that the Mississippi and Missouri rivers had equal breadth and discharged equal quantities, the breadth of each represented by b and their resultant by b' , then $b' = 1.32b$, and the breadth would be increased one-third. But if on the contrary the united rivers should be divided into two equal branches, each of them would have the breadth $b = 0.76b'$, about three fourths of the bed of the undivided river." Stein, Com. Rev., February, 1850.

† It may, and probably will be objected, that floating drift wood is not a reliable index to the current's velocity, because of atmospheric friction and accidental disturbances. Some care was always taken in selecting bodies least liable to these objections, and calm days invariably chosen. The estimated distances too are liable to be erroneous, but when the objects timed are very numerous, the errors arising from estimating distances from shore may be assumed to cancel each other. Let those who have better observations offer them. I pretend only to approximations.

any mark* since reached. Governor Sargeant records this tradition in 1809, when there was a flood higher than for forty years. The accompanying table, or scale L, will show the relative height in different years for forty years, and the date of culmination. These are from a register kept of actual rise and fall for thirty years, and from other sources reliable. The range of high water marks is three feet at Carrollton—1839, April 8th—the highest water of the year being three feet four inches below high water. Low water marks have a much greater range; the lowest mark of 1844 being seven feet above the lowest known.

14. The median line or curve of rise and fall for thirty years, 1817 to 1847, reaches an elevation just one foot seven inches below the mark of 1849.—This is in the last week of April, which proves to be the mean time of highest water. The lowest water by the same mean is on the 1st of October, and is three feet six inches above the lowest mark. It will be observed that this table has been reduced to Carrollton, or 15 feet range in rise and fall; but the dates have not been altered. They should be reckoned a week or ten days later for Carrollton than for Vidalia. The mean height of this line for the whole thirty years is 7,222 feet below highest mark.

15. *Recapitulation.*—We have shown the "rate of fall," depth, breadth, velocity, and rise and fall of the water. From these we may compute the rate of discharge at all stages, and the mean rate for 30 years. And the quantity by these data is 12,250,000,000,000 cubic feet per minute, or 447,199 cubic feet per second.

It is worthy of special observation, that the mean for the three sets of ten years shows a lower level of discharge at each consecutive ten.

16. *Sediment.*—The experiments of Prof. J. L. Riddell show the sedimentary matter transported by the Mississippi to bear a proportion in bulk to the whole quantity discharged of one to three thousand.† At this rate, the cubic contents would be by my measurements, as above, equal to 4,083,333,333 cubic feet. The sediment, then, would cover twelve miles square one foot deep.

To be continued.

GOLD COINS.

The deterioration in our gold coins has caused considerable conversation of late, in our banking institutions. It is ascertained that the coinage of only a few years date is quite deficient in weight: so much so, that most parcels of \$5,000, or less, fall short several dollars. According to the standard, Eagles, Half Eagles, etc., are a legal tender, at a certain specified weight, and if they do not weigh the requisite amount, can they be received at the count? The difference in weight of a single piece is very trifling, but in the aggregate there is quite a deficiency. This process of deterioration is going on from day to day, and the coins which at this time are of full weight, will in a few months, perhaps, according to the wear, be designated as light coin. We understand the banks in this city have decided to receive gold only at weight, which decision, we think, is according to law.

Gold, being more ductile than any other metals of which coins are composed, and more valuable, more care is necessary; and we think the time will come, when the same course will be pursued here as in England. There a Sovereign is received at its weight, and American gold must be received in the same manner.

* To those accustomed to the woods which have been long inundated, it will not be surprising that water marks remain many years, possibly half a century. The water mark of 1828 is perfectly visible over a large portion of our alluvion, and is, in the woods above Bayou Sara, two and a half inches above the highest mark of 1849. I examined this matter most thoroughly.

† The experiments made by Andrew Brown, Esq. of Natchez, Miss., and read before the American Association for the Promotion of Science, by Dr. Dickeson, give a much larger proportion of sediment; but from the manner of conducting the experiments and obtaining the water tested, I rely upon the results of Dr. Riddell in preference.

[From the Philadelphia Evening Bulletin.]

GENERAL CONDITION OF THE BANKS OF THE UNITED STATES, JAN. 1, 1850.

States.	Banks.	Br'chs.	Capital.	Loans and discounts.	Stocks.	Real estate.	Other investments.	Due by other banks.	Notes of other banks.	Specie funds.	Specie.	Circulation.	Deposits.	Due to other banks.	Other liabilities.
Maine.....	32		\$3,098,000	\$5,275,170		\$118,060		\$711,894	\$711,894	\$58,337	\$339,231	\$2,252,764	\$1,094,098	\$55,182	\$25,153
New Hampshire.....	23		2,186,600	3,956,881		47,601		421,853	79,109	139,125	159,125	1,776,921	481,114	\$55,182	
Vermont.....	24		1,826,975	3,613,227	\$40,996	89,125	\$1,105	648,421	151,049	2,749,917	130,798	2,392,902	380,195	21,448	716,415
Massachusetts.....	119		34,630,011	56,599,309		1,126,161		4,472,950	3,737,150	8,001,639	2,912,295	15,700,935	9,875,316	4,720,815	126,034
Rhode Island.....	61		11,212,406	14,822,306	155,479	236,616	13,708	484,918	443,445	\$58,337	575,656	4,511,570	4,311,110	588,295	287,249
Connecticut.....	36	2	8,928,268	14,043,006	275,904	332,745	757	1,470,853	196,268	8,001,639	8,066,313	24,105,980	41,613,744	17,709,410	9,282,896
New York.....	185	2	45,541,708	93,063,599	11,755,706	3,850,555	803,157	10,193,737	2,611,608	2,315,353	3,828,754	11,405,455	15,710,150	3,905,873	128,234
New Jersey.....	24		3,565,298	6,377,034	45,200	292,730	11,379	1,100,162	383,008	17,727	2,468,235	3,091,406	5,183,609	1,732,813	3,178
Pennsylvania.....	47	5	17,182,174	34,927,479	1,684,099	1,232,882	2,393,114	3,023,601	2,802,118	59,789	2,709,055	8,944,752	4,238,875	328,992	
Delaware.....	4	3	940,000	1,633,595	1,925	85,024		218,341	72,992	7,664	1,410,254	3,415,788	720,778	62,330	
Maryland.....	21	2	8,704,711	13,707,558	966,080	384,760	19,682	1,068,577	790,505	239,278	1,711,902	8,741,765	3,322,132	2,047,777	642,231
Virginia.....	6	30	9,731,370	18,163,300	372,442	811,270	68,042	1,813,448	433,848	359,325	1,547,626	4,118,419	1,697,099	406,580	1,774,905
North Carolina.....	4	15	3,407,300	5,169,077	150,000	131,469	11,218	790,026	402,517	492,667	6,979,772	5,069,867	8,210,705	1,763,831	307,937
South Carolina.....	12	2	13,139,571	20,601,137	1,840,463	377,571	348,563	2,850,942	715,093						
Georgia.....	11	7	12,593,010	6,953,166	1,690,378	6,487,104	1,404,775	1,753,467	325,515						
Alabama.....	1		1,500,000	2,116,591	71,018	152,601	1,229,201	928,200	16,020						
Louisiana.....	6	22	14,257,920	18,602,649	624,081	2,743,270	2,656,607	3,879,996	406,656						
Tennessee.....	4	18	7,026,987	9,008,639	24,081	582,853	29,750	888,786	406,656						
Kentucky.....	3	13	7,030,900	11,637,207	546,000	417,312	485,245	1,601,303	700,054						
Missouri.....	1	5	1,208,751	3,265,270		114,175	193,973	281,820	36,820						
Indiana.....	1	12	2,082,910	3,912,796	237,215	369,860	210,515	749,863	101,970						
Ohio.....	56		7,129,327	15,594,139	237,215	369,860	210,515	2,315,810	1,581,329	50,192	3,242,825	10,444,555	4,567,111	1,293,505	1,476,929
Michigan.....	4	1	392,530	1,080,664	140,777	237,519	68,532	166,187	57,094	1,224	107,210	624,431	266,411	16,863	189,195
	685	139	217,317,211	364,304,078	20,606,759	20,582,166	11,949,546	41,631,855	16,303,288	11,603,245	45,379,345	131,366,526	109,586,595	36,717,451	8,805,300

The Railways of the World.

One of the most surprising circumstances attending the creation of railways is the amount of capital which, within a limited period, has been expended in their construction and equipment. According to the calculations supplied in the work before us, there were in operation at the commencement of 1849, in different parts of the globe, a total length of 18,656 miles of railway, on which a capital of £368,567,000 had been actually expended. Besides

this, it is estimated that there were at the same epoch, in progress of construction, a further extent of 7,829 miles, the cost of which, when completed would be £146,750,000. Thus, when these latter lines shall have been brought into operation, the population of Europe and the United States (for it is there only that railways have made any progress) will have completed, within the period of less than a quarter of a century, 26,485 miles of railway—that is to say, a greater length than would com-

pletely surround the globe, at a cost of above £500,000,000 sterling. To accomplish this stupendous work, human industry must have appropriated, out of its annual savings, £20,000,000 sterling for 25 successive years! Of this prodigious investment, the small spot of the globe which we inhabit has had a share, which will form not the least striking fact in our history. Of the total length of railways in actual operation in all parts of the globe, 27 miles in every 100 are in the United Kingdom! But the proportion of the entire amount of railway capital contributed by British industry is even more remarkable. It appears that, of the entire amount of capital expended on the railways of the world, £54 in every 100; and of the capital to be expended on those in progress, £68 in every £100 are appropriated to British railways!—*Ibid.*

Alabama.

Alabama and Tennessee Railroad.—A large convention of the stockholders in this road was held at Shelby Springs on the 13th ult., for the purpose of considering the steps to be taken in relation to the commencement and prosecution of this work.

By the report of the committee in the business of the convention, it appears that the subscriptions to the capital stock of the company are as follows:

Mobile	\$200,000
Selma	231,000
Shelby, Bibb and Perry	116,000
Talladega	185,000
Benton	117,000
Cherokee and DeKalb	74,000

\$923,000

To which should be added the appropriation of the legislature, variously estimated at from \$260,000 to \$300,000. By the act of the legislature this appropriation was divided into three parts, pro rata, according to the distance, viz: from Selma to the Coosa river in Shelby county, from the Coosa river to Gadsden, and from Gadsden to Gunter's Landing. This division would give from \$206,965 to \$238,806 of the appropriation to be applied to the two divisions from Selma to Gadsden, making the total present means of the company to build the road from Selma to Gadsden, equal to from \$1,129,965 to \$1,161,806. In this estimate of the means of the company, the value of the grading already done, is not included; this is estimated at \$60,000.

By the report of the chief engineer it appears, that the total cost of the road on one of the routes surveyed complete for the reception of its furniture and motive power, is as follows:

From Selma to Montevallo	\$681,111
From Selma to Coosa river, in Shelby co. 1,129,782	
From Selma to Talladega	1,519,874
" Gadsden	2,198,696

The following table shows the proportion, in this estimate of the cost of the road, between the grading or work, which may be executed by the common labor of the country and the iron, engineering and mechanical labor:

	Grading or work which may be executed by the common labor of the country.	Iron, engineering & mechanical labor.
Selma to Montevallo ..	\$153,344	\$527,770
Selma to Coosa river, in Shelby county ..	236,448	843,333
Selma to Talladega ..	377,832	1,142,042
" Gadsden	598,936	1,599,760

It is evident from an inspection of this table that with the present means of the company it is practicable to grade the road to Gadsden, and to build it to Montevallo without incurring liabilities.

The subscriptions which have been made may be divided into two classes—1st, those which will be paid for in cash, and 2d, those which will be aid for in labor.

The first class is estimated to comprise the—

Mobile subscription	\$200,000
Selma	200,000
Shelby, Bibb and Perry	76,000
Talladega	100,000
Benton	65,000
Cherokee and DeKalb	40,000

\$681,000

Appropriation

238,806

Total probable cash means

\$919,806

The second class, or subscriptions payable in labor, may be estimated for—

Selma	\$31,000
Shelby, Bibb and Perry	40,000
Talladega	85,000
Benton	52,000
Cherokee	34,000

Total probable subscription payable in labor

\$242,000

According to this division it would require—

1st. But an addition of \$280,463 to the labor subscription to grade the road to Gadsden and to build it to the Coosa river.

2d. An addition of \$222,236 to the cash subscription, and of \$356,936 to the labor subscription, would be required to grade the road to Gadsden and to construct it to Talladega.

3d. An addition of \$356,936 to the labor subscription, and of \$679,954 to the cash subscription, would be needed to build the road from Selma to Gadsden.

In view of the favorable character of the country for the construction of a cheap and effective railroad, and of the certainty, that when completed, your enterprise will yield a handsome dividend on its cost, the committee believe that as soon as the road is commenced, and proof is given that it will be vigorously prosecuted, renewed and increased confidence will be established, and the subscriptions will be largely augmented.

In addition to the means above provided, a bill has already passed the Senate of the United States, of a similar character to those in favor of other roads, aiding this work by a grant of the public lands. Should this bill become a law, it will largely add to the means of this company.

The committee advise that the road should be placed under contract at once, and express a belief that it can be completed in three years.

In relation to furnishing this road with Alabama rails, the committee say:

The question of the propriety of furnishing the road with Alabama iron has been referred to the committee. The committee consider it a matter of very great importance to the company that this subject should be thoroughly investigated, and if practicable, that arrangements should be made to procure Alabama iron rails. The supplies of excellent iron ore and coal, on and near the route of the road, are great; unrivalled facilities for the cheap manufacture of iron also exist, and the committee do not conceive why with these great advantages the whole road, or a large portion of the road, should not be laid with Alabama rails. The committee will not enter into a discussion of the merits of this question, but would suggest that the directors could not adopt a policy which would be more conducive to the interests of the company and of the country traversed by the road, than to make, if practicable and consistent with the interests of the company, such arrangements as will cause the iron to be manufactured among ourselves.

Whether the rails shall be made of Alabama iron or not, this project we see has already turned the attention of the people of that State toward their great mineral resources, and will have the effect to bring into use what, to a great extent, would have remained dormant, but for such a work.

The road is to be one of the first class, as far as construction is concerned. Of the ability of the people interested in it to build it in three years, we

have not a doubt. They can now commence work with a very respectable amount of means secured, a much larger proportion of the cost than most works of a similar character in the west can show. Certainly no difficulty will be met in obtaining the additional amount wanted as the work progresses.

Indiana.

Lafayette Railroad.—The Indiana State Sentinel of August 28th, says—"A letting of the grubbing, grading, etc., of this road from Lebanon to Indianapolis will take place on Wednesday next. The road from Lebanon to Lafayette is nearly ready for the iron. The depot having been located at Indianapolis, and the route fully established, and many of the citizens of Indianapolis having taken hold of the work with spirit and energy, there is now every prospect of a speedy completion of this work. It is only 62 miles to the Wabash river, at Lafayette, by this route, and it is said to be the cheapest railroad route in the State."

European and North American Railroad.

We copy the following table of distances of this line, from a speech of M. H. Perley, Esq., of St. John, N. B., recently made by him in that city.

	Miles.
From Halifax to the boundary of Nova Scotia, near Baie Verte (surveyed)	124
From thence to the Harbor of Shediac (surveyed)	26
From Shediac to St. John (Wilkinson's survey)	108
From Halifax to St. John	258
St. John to Calias, under survey, estimated. . .	76
From Halifax to the frontier of the U. States. 334 (Of this distance 124 miles is in Nova Scotia, and 210 in New Brunswick).	
From Calias to Bangor, in a direct line, is 90 miles, but the railway route is estimated at. . .	112
Whole length of the European and North American railway	446

Illinois.

Galena and Chicago Railroad.

We copy the following from the Chicago Tribune relative to the progress of this work:

We have delayed answering our enterprising cotemporary for some days, in order that we might be able to give definite information. It now gives us pleasure to state, that the directors who went east a few weeks ago to try to negotiate a loan for the continuation of the road, have succeeded, without difficulty, in obtaining \$400,000 at a very low rate of interest. We understand farther, though not officially, that so fair does the credit of the company stand in the eastern money market, that it has offers of enough to complete the entire line; but of course no more has been taken than can be used advantageously at this time. With the loan obtained, and the subscriptions to stock already made, the directors will be able to complete the road to Rockford, next year, and may, also, probably, be able to prepare the track of the branch between Rockford and Beloit. The section of the road between Rockford and Galena will be put under contract immediately after the completion of the section between Elgin and Rockford, and it is not improbable that it may be sooner. The directors of the company are prudent business men, and will not make any engagements that will jeopard the interests of stockholders, or give to eastern capitalists the control of the road. A report has been published that an eastern company propose, on certain conditions, to complete the entire line from Elgin to Galena. If any company of private individuals can carry through a work in so short a time, we doubt not the directors of the road can do it equally as soon. One thing may be depended on, that the road will be completed in 1853, at which time it is supposed the line between this city and Toledo, and thence around Lake Erie, on the

southern shore. will also be constructed, so as to give one continuous railroad chain between Galena and the eastern cities.

Maine.

The Pembroke Iron Works are in successful operation; and besides making Pembroke look exceedingly lively, add an attraction to the passer by. We observed them in operation, the other day, in company with quite a number of ladies and gentlemen from a pleasure party. The way they 'use up the old iron' is a perfect caution—it was to the ladies—to stand back! And the way they turn out the cut nails in the nail factory, is rather fast than otherwise. Mr. Wadsworth, the superintendent, informed us that the establishment employed 150 workmen—and, including teamsters, &c., nearly 200. The works turn out at the rate of about 5,000 tons of iron per annum; it costs for the furnace about \$10, and when worked out is worth in Boston about \$60 per ton, making the aggregate yearly amount of iron worth \$300,000. The wages paid range from \$1 25 to \$3 per day. The freighting for the works employs a number of vessels constantly. Indeed, with the iron works, ship building, trade, farming, &c., Pembroke is decidedly looking up.—*Eastport Sentinel*.

Iron Mountain in Wisconsin.

A few days since, says the Mineral Point Tribune, of July 12th, we were shown a specimen of ore brought from Black river, Crawford county, the quality of which surpasses any iron ore we have ever before seen. So pure is it, that it was thought by good judges that smelting furnaces will be unnecessary for obtaining the pure metal, it yielded about ninety per cent. The amount of ore is said to be very great, it covering at least forty acres.—Other veins have been discovered near by, and, if our informants are not very much deceived, this discovery is very sure to add much to the already extensive mineral wealth of Wisconsin. Specimens have been sent to experienced iron masters at the east, who pronounce it of a superior quality. An abundance of water power is near at hand for carrying on furnaces; and as it is near navigable water, it must very soon become a source of profit to the enterprising gentlemen who have surveyed and located the land for the purpose of erecting iron manufactories at no very distant day.

Panama Railroad.

In addition to our notice of this road last week, we learn that a great portion of the rails have been contracted for in England for several months; and that 1,500 tons of them are already delivered on the Isthmus. The pattern is a heavy \square rail, of 60 lbs. to the yard. The wrought iron spikes and chairs will be made in this country.

Ohio.

Railroad to Belleville.—It will be seen by reference to our advertising columns that the construction of the Mansfield and Sandusky railroad has been completed to Belleville, 14 miles south of Mansfield, to which place the cars are hereafter to run regularly. By the 1st of October the entire road to Newark, 60 miles from Mansfield, it is expected will be put in operation—in time to bring in a portion of the immense quantity of wheat thro' that region, for lake shipment this fall.

The road from Mansfield to Newark is to be all laid with the T rail, and in every respect is unsurpassed by any road in the country.—*Sandusky Mirror*.

Pennsylvania.

Hempfield Railroad.—This road is to branch from the Pennsylvania Central railroad, at Greensburgh, and run direct to Wheeling, there to connect with the Ohio Central. The main object of this road is, we presume, to make a short cut to Central Ohio, instead of taking the more circuitous route by way of Pittsburgh. On this ground it is opposed by that city. The exploration of the route was made by J. Knight, Esq., who estimates the cost of the road at \$25,000 per mile.

The distance from Greensburgh to Wheeling is 80 miles, and the Engineer states the whole distance from Philadelphia to Wheeling, on this route, to be as follows:

From Wheeling to Greensburgh.....	80
Greensburgh to Harrisburgh.....	220
Harrisburgh to Philadelphia.....	107

Total..... 407

New Hampshire.

New Hampshire Central Railroad.—The laying of the rails above Old Mill Village will commence next week. It is supposed that the track will be completed to Weare Factory by the first of November, and perhaps at an earlier day. The distance is about 18 miles from Manchester.—*Manchester American*.

Indiana.

Junction Railroad.—The Junction railroad, from Hamilton to Rushville, has been put in motion with good prospects of success—a board of directors has been elected of which the Hon. Caleb B. Smith is the President; and the Connorsville Chronicle says; "the success of the proposed road seems now to have assumed a character of certainty."

Missouri.

Pacific Railway.

At a recent election in St. Louis county, the proposition to subscribe \$100,000 on behalf of the county, to the Pacific railroad, was submitted to the vote of the people, and carried by yeas 4,248, against nays 467.

Pennsylvania.

The Pennsylvania railroad, says the Philadelphia Ledger, will be opened about the 1st of September to Hollidaysburg. At Hollidaysburg the road connects with the Portage railroad to Johnstown. Passengers for the west will have a continuous railroad from Philadelphia to Johnstown, a distance of two hundred and eighty miles. At Johnstown they take the stages going through the entire distance from Philadelphia to Pittsburgh in thirty-two hours, or by railroad and canal, without the fatigue of night travel by land, in 40 hours.—This is the most expeditious and pleasant route which can be taken, and the announcement will induce many passengers to choose it in preference to any other.

Tennessee.

Nashville and Chattanooga Railroad.—Col. V. K. Stevenson, the intelligent and go-ahead President of the above road, has been in this place for the last ten or fifteen days, waiting to see the operations on this end of the road fairly under way.—We have heretofore mentioned that the Irish laborers had arrived, and they are now only waiting for the tools, which had been heard from early in the week and were expected daily. The work from this place to the Tennessee river is very heavy, and Col. Stevenson very properly deems it essential that he should watch over it with vigilance. From the character of the contractors, we have reason to believe that the work will be pressed forward to an early completion.—*Chattanooga Gazette*.

Massachusetts.

Georgetown & Lawrence Railroad.—The friends of this enterprise met in West Boxford on Tuesday last, the charter of the road was accepted, and the following gentlemen chosen directors: George J. Tenney, President, and Samuel Little of Georgetown, Enoch Wood of Boxford, James Stevens of Andover, and Oliver M. Whipple of Lowell; the meeting stands adjourned to Tuesday of next week at the same place. James Stevens is clerk of the corporation. The route of this road is 6½ miles in

extent from Georgetown to the Essex railroad at North Andover. The whole cost of the land damages, grading, superstructure, fencing, and buildings of the road, is estimated at only \$92,000, being less than \$15,000 per mile. Efforts are now making to fill up the stock subscription. There is also another chartered route of railroad extending above Georgetown, designed to run through Groveland and connect with the Boston and Maine railroad at Bradford; this has also been recently re-surveyed, and is understood to be the favorite route in Newburyport, while the other has the preference at Georgetown.—*Salem Register*.

Ohio.

At a meeting of the stockholders of the Central Ohio railroad, convened in Zanesville on the 27th ult., the following directors were chosen for the ensuing year:

John H. Sullivan, James Raguet, George James, Wm. Galigher, S. R. Hosmer, J. L. Cox, E. Ball, Daniel Brush, Levi Claypool, of Muskingum; J. Brumbach, A. Sherwood, of Licking; W. Dennison, G. Parson, or Franklin.

At a meeting of the directors, the following officers were re-elected:

J. H. Sullivan, President.

D. Brush, Treasurer.

D. H. Lyman, Secretary.

Ship Canal at Ste. Marie.

The Lake Superior Journal is agitating the project of a ship canal around the Ste. Marie Falls.—We extract the following:

The estimated cost of a ship canal, with 12 feet of water, around the Falls, is \$200,000. The whole length of contemplated canal is 4,460 feet, a trifle over three fourths of a mile, in which distance a fall of 18 feet is to be overcome by two locks of 9 feet lift each, and in length not less than 250 feet, and 60 feet wide, to be constructed of cut stone, and to have a sufficient depth of water to pass vessels drawing 10 feet of water at all times. The canal will be 80 feet at bottom, and 100 feet at the water line, and will be constructed on the old survey by the engineers of the general government, which is on a straight line across the bend of the river at this point; and when completed it will afford some of the finest water power in the world, which must of itself afford considerable revenue to the company.

Dust on Railroads.

One of the great drawbacks to comfort in railroad travelling, is the dust thrown up by the wheels. It is said that a Mr. Bromley, of New Haven, has invented a remedy for this, which is represented to have met the approval of intelligent railroad gentlemen. It is to encase the wheels so as to prevent the dust from rising at the sides, and then by India rubber aprons and springs to keep it from rising between the cars. These contrivances may be so arranged as not to encumber the wheels; while the aprons spread between the cars have another useful purpose, as they prevent people from falling on to the track, if by any mishap they should slip or fall off the platform. If Mr. Bromley has succeeded in removing this great inconvenience of railroad travelling, he deserves the thanks of the travelling public, as well as a rich pecuniary reward.

Canada.

We see it stated in our exchanges, that the Toronto and Simcoe railroad is now in a fair way to be built. The city council have resolved to loan the credit of the city to the company for \$400,000. They ask security of the stockholders on real estate or bank stock before issuing debentures. The county of Simcoe pledge \$200,000 debentures for the same object.

GRAHAM'S COMPOSITION, to Remove and Prevent Incrustation (or Scale) in STEAM BOILERS.

THIS valuable composition having been fully and extensively tested, is now offered to the public, as a sure remedy and preventive for incrustations in steam boilers of all descriptions. By its use, all scale is entirely removed from the boilers of Ocean and River Steamers, Locomotive and Stationary Engines, in from 3 to 20 running days, according to the size of the boiler and thickness of the scale. In New Boilers, all incrustation is prevented at a trifling expense.

The preservation of the boiler, great economy of fuel and labor, safety, and increased speed, are among the advantages to be derived from the use of this composition.

Orders should state the quality of water used, viz: "Salt," "Fresh," or "Brackish."

For sale, with directions for use, by
W. H. NEWMAN,
75 Pearl street,
New York.

TESTIMONIALS.

New York, August 17, 1850.

We have used Graham's Composition in the boilers of the Steamship Southerner, during several voyages between this place and Charleston. The boilers were old and very foul with scale, a very large quantity of which was removed by the use of the composition, and no new scale was formed.

From our own experience and observation in the use of the article, we are fully satisfied that it will effectually remove the incrustation made by sea water, and also that it will effectually prevent its formation.

We are also satisfied that the use of it will be attended with a great saving of fuel, and that it has no injurious effect upon iron.

DAVID N. MAXON, Engineer,
BERRY, Master,
Steamship Southerner.

Steamship Philadelphia, }
New York, August 27, 1850. }

I have used "Graham's Composition for Steam Boilers," in the boilers of Steamship Philadelphia, on the voyage to and from Chagres, and am entirely satisfied that it will remove, dissolve and prevent all scale or incrustation in salt water boilers.

For the preservation of the boiler and economy of fuel and labor, I hereby recommend the employment of this composition in the Boilers of Ocean Steamers.

WM. BISBY,
Chief Engineer.

Novelty Iron Works, }
New York, July 5, 1850. }

We have examined the specimen of Graham's Composition for preventing incrustation of steam boilers, and we believe it may be used with perfect safety in reasonable quantities for the purpose intended, as there does not appear to be any agent in the composition calculated to injure the iron.

STILLMAN, ALLEN & CO.

Piermont, May 20, 1850.

I have used "Graham's Composition," and find it to produce the intended effect; and I hereby, without hesitation, recommend it for Stationary, Marine and Locomotive Engine Boilers.

JOHN BRANDT,
Superintendent Motive Power
New York & Erie R.R.

New York, July 25, 1850.

In answer to many inquiries as to the practical effect of "Graham's Composition," I will state that I have used it in the boiler of the Steamboat Sunwick, which had become considerably incrustated with hard scale from both salt and fresh water. We used 10 lbs. per day, for three days, without blowing off the water, until the fifth day, when all was drawn off. To our astonishment, we found the whole interior of the boiler as clear of scale and smooth as when it came from the hands of the maker. The following week, we tried the same quantity in a small steam tow boat. The boiler had old scale of long accumulation and very thick. We ran the boat three days without blowing off, and on the fourth day washed out the boiler and found it, like the "Sunwick's," perfectly clean and smooth as when new. I am therefore enabled to state that the use of the composition in these two instances under my own immediate observation and direction, has been attended with complete success.

JAMES MORROW,
Engineer Astoria Ferry.

AMERICAN RAILROAD JOURNAL.

Saturday, September 7, 1850.

Montgomery, Ala., August 23, 1850.

TO THE EDITOR OF THE R. R. JOURNAL:

Sir—Had you published your comments on my letter, which is inserted on the 487th page of your Journal, in the same number which contained that letter, I would been content to have submitted the issues between us to your readers without further remarks; but as you delayed your comments for one week, and for a different number of your Journal—which may be read by persons who may never see my letter referred to—I must respectfully ask to be permitted to reply through the medium of your Journal, to the comments.

In your first notice of the "Remington Bridge," you manifested, I thought, a disposition to criticise and condemn its principle of construction, without entirely comprehending the subject. Of this I did not complain. As an inventor, I have become used to the prevalent habit of a large class of men to condemn everything that is outside the reach of their comprehension. I, therefore, contented myself with inditing for your Journal a reply, which I designed to be in good temper, and to manifest entire fairness.

In your rejoinder, I have to complain that the same rule does not seem to be observed. You volunteer advice, when the business in hand called on you for facts—or at least reasons, good and sufficient, for your opinions adverse to my bridge. You were so very free in your strictures, that, leaving the main points at issue entirely, you assume to speak the judgment of the people as to my "position" and my poor merits as an inventor.

Now, sir, permit me to remark that I am very much disposed to question your right to speak for any body save yourself, as I am, also, to question your competency to instruct, or your right to advise me concerning the matter at issue or any other of like character. I certainly should not have troubled you with any communication, but for your illiberal criticism; and permit me to add that if you understand your own "position," as I hope I do mine toward the public, you will not again venture to indulge in flippant strictures, or blundering misstatements, where argument and facts are demanded.

In your criticism just published, you say my bridge is "simply a truss bridge;" that there is no new idea or principle in it, and that iron bridges are stronger, more durable, and cheaper in the end.

To all these points I replied in detail. I demonstrated that my bridge was not a truss bridge: and what was your reply? "The gentleman exhibiting the model told you so!" Suppose that some gentleman were to assert that your Journal was *partisan* in its character—would that make it so? It would not, of course. Well, then, you see plainly the inconclusiveness of the reason which induced you to assert an error of fact. I have no interest whatever in the exhibition of my bridge in New York. I never saw it, and do not know, further than what I see in the newspapers, that it represents my principle of construction. It occurs to me that before you ventured to pronounce my bridge "simply a truss bridge," presenting "no new idea," that, as the conductor of a scientific journal, it was your duty to examine it. In not doing so, but in pronouncing judgment on another man's opinion,

you leave yourself open to the suspicion of harboring a "foregone conclusion" adverse to it.

Your next objection is equally indefensible as that just noticed. You quote one as saying that my bridge is entirely free from "oscillatory motion," and, thereupon remark—

"We certainly cannot tell what he means by this statement, as exactly the opposite is the fact, as any one can readily see."

The dogged positiveness of this assertion, that "any one can readily see" oscillatory motion in the Remington bridge, notwithstanding I have said there is none, deserves to be characterised by language I shall not use. Why, sir, you have never seen a Remington bridge, erected for practical purposes! You are enlisted against a structure, of which your own hastily expressed opinions show you have no correct idea, or information. To oscillate is to move as the pendulum of a clock. Now, sir, I assert most positively and unequivocally that there is no such motion in a Remington bridge. A bridge 406 feet span, 12 feet wide, is now completed at this city, and a wagon with five mules in passing over it has demonstrated what I assert.—But you say it was this motion which broke the model bridge in New York. This is your opinion only; I maintain (if the bridge was properly constructed) that you are in error. I have had longitudinal supporters in model bridges subjected to every test of strength, and they never broke, unless a dead weight, more than equal to their strength, was put upon them. If one of the stringers in the New York model broke, I am sure that it either broke from an excess of weight, or from some defect in the timber.

It reply to my remarks controverting your assumption that the Remington bridge is a suspension bridge, and that iron, in everything, is better than wood, you say—

"Mr. Remington claims that his own bridge is as much stronger than iron as 14 is to 9! His model with three stringers sustained a weight of 14 tons. He says that a bar of the best charcoal iron, one inch square, will sustain only 3 tons, and refers to Talford for authority. We have examined Talford's tables, and find that he gives 29 1/2 tons as the strength of a bar of iron one inch square." * * * "We are certainly astonished to see a man coming forward at this late day, and claiming that wood is stronger than iron."

I have never, sir, in all my life met with a more manifest illustration of the habit some writers have of setting up a man of straw, and knocking him down again, than is presented in the above quotation. In the sentence I have quoted in italics, you misquote me and misrepresent me entirely. Your "astonishment," therefore, is something akin to the noise made to represent thunder in our theatres: it was manufactured for the occasion. What I did say was this—

"A model bridge with three stringers one inch square, at a curvature of one-fiftieth of their chord line sustained a weight of fourteen and one half tons."

The proof of this I sent you, which although very brief you have not published.

I said further that: "The best charcoal iron, with a curvature of one fiftieth of its chord line, will only sustain three tons to the square inch, and consequently if the stringers had been iron, in the bridge referred to, the breaking point would have been at nine tons."

For authority as to the facts concerning iron I referred you to Talford, as you remark

Now, sir, I shall show wherein you have "misquoted and misrepresented me."

You say: "We have examined Talford, and find that he gives 29½ as the strength of a bar of iron one inch square."

You found more, and different testimony; but it did not suit your purpose to tell it all.

Talford says: "A ton of good English malleable iron one inch square will suspend from 27 to 30 tons before it breaks, and will bear from 15 to 16 tons before its length is at all extended. With a curvature of one twentieth of the length malleable iron besides its own weight sustained one third of what broke it perpendicularly. An inch bar would therefore bear one third of fifteen tons (at a curvature of one-twentieth its length.—R.) without deranging its parts; but it is better in practice to assume that an inch square in section should only bear four tons."—[Page 507 Cressys En. of Civil Eng.]

Taking Talford's authority, quoted on the page already cited, for the strength of iron wire at one-fiftieth of its chord line (the curvature of my bridge at the trial of its strength in this city) I assume that a square inch of iron in section will only sustain three tons—but assuming it to be four, which Talford gives it at one twentieth of its chord line, I still have this result: Iron in section would have sustained 12 tons; my bridge sustained 14½ tons.

Perhaps, sir, you have not examined authorities of this kind as closely as an editor of a scientific journal should, and hence your astonishment and wonder. But you will yet learn that—

"There are more things in Heaven and Earth Than are dreamed of in your philosophy."

In this article I have simply designed to set you right where you had committed manifest errors.—I shall trouble you, sir, no more.

Very respectfully,

JOHN R. REMINGTON.

Our notices of the "Remington Bridge" were based upon the model exhibited in this city. Mr. Remington did not in his first communication disclaim this model. We supposed (without having made any inquiry as to the fact), that it was constructed under his direction, and exhibited with his approbation. If we have been misdirected in this matter, if we have not seen the Remington bridge, and if the person who exhibits what is claimed to be one, had no authority to speak in the premises, why then we have been barking up the wrong tree. We made no assertions of the model that were not strictly and palpably true. If, therefore, the model is not a copy then we have not been discussing the Remington bridge, but a counterfeit. We would not advise, but if we were in Mr. Remington's place would not suffer ourselves to be misrepresented, and consequently injured, by persons going about the country with models, and claiming to speak for ourselves without authority. The model moved in any direction, almost as readily as would a rope under weight or pressure. We will not stop to define the nature of this motion, whether it was vibratory, oscillatory, or any other motion. It was universal as far as the slack would allow it, and we believe that the greater includes the less.

But to the main point. We have not seen the elephant, and of course have been describing another animal. The great point to be settled, and the one about which the public feel any interest is Mr. Remington's claims as inventor. Waiving everything else, let us look at this. We give Mr. Remington's claims in his own words:

"To illustrate more clearly this point I will add

that, the tensile strength of timber when in nearly a horizontal position is made to sustain nearly the entire weight necessary to separate the fibres. This I claim is a new idea in mechanics. I applied it in the use of timber in constructing bridges for the first time. The same fact does not apply in any suspension bridge, whether constructed of hemp or iron."

Now we join issue here with Mr. Remington.—We contend that all bridges to a greater or less extent depend upon the tensile strength of wood. All truss bridges depend very largely upon the tensile strength of the bottom chord. Every scientific bridge builder calculates the strength of this chord as one of the elements of the strength of the structure. What Mr. Remington claims as a discovery is a principle familiar to all bridge builders and has been in application ever since wooden bridges have been in use. Having stated Mr. Remington's claims in his own language, and our objections, we are content to leave the decision in the hands of persons whose experience constitute them the proper judges.

The next point is will iron in a horizontal position, or with a slight curvature, sustain a greater weight than the same area of wood. Confinement to the house from indisposition has prevented us from examining into this branch of the subject, which will receive attention in our next. We have no doubt upon such examination that it will be found that the same relative strength will be found to continue in whatever position placed. The only evidence we have that this rule will not hold good is the experiment of Mr. Remington, which, isolated from all others, cannot be received as establishing a general principle, even if made by Talford himself. No sensible person would think of basing a principle upon the evidence of one experiment. Upon the authority of Talford, given by Mr. R., the breaking weight of an inch bar with a curvature of 1-20th of its chord line would be 10 tons, more than double the weight required to break the Remington bridge. It would be unsafe to be sure to subject it to this load, but no more so than to subject the wooden bridge to a similar test. Therefore Mr. Remington's assertion, that if the stringers in his experiment had been iron instead of wood the breaking weight would have been at 9 instead of 14 tons entirely incorrect even upon his own evidence. If iron had been used it would have been at 30 instead of 14 tons. But as we propose to look further into this matter in our next, we will reserve further remarks till then.

Graham's Composition to Remove Scale in Steam Boilers.

We invite attention to the Advertisement of W. H. Newman, in another part of our paper, of the sale of the above article.

The injury to boilers from the scale, as it is termed, is not only a source of great expense, in the more rapid wear of boilers, and in the constant repairs necessary to keep them in order; but in the additional amount of fuel required to keep up steam in an encrusted boiler. Every person acquainted with their use is familiar with these facts, and will readily appreciate the value of any remedy that can remove the evil.

Mr. Newman claims that he now offers such a remedy in the above composition; and the testimonials he offers of its value are of the most satisfactory kind—from persons of well known experience and character—who are not only the persons best qualified to give an opinion in these matters, but

who would not express one that was not the result of their own convictions.

We have no doubt but from other testimony we have seen in its favor, that it is all it is represented to be, and we have no hesitation in recommending its use.

NOTICE

For Proposals for Railroad Iron, for the Alabama and Tennessee River Railroad,

TO BE MANUFACTURED FROM ALABAMA ORE.

THE Alabama and Tennessee River Railroad Co. invite proposals, until the 1st of January, 1851, for Iron Rails, to be made of Alabama Ore, for the Northern Division and part of the Southern Division of their road, embracing a distance of about 105 miles. The rails are to be of the T pattern, in lengths of 18 feet, and weighing 63 lbs. per lineal yard. They are to be delivered on the Coosa river, at a landing to be hereafter designated, between Kinulgee ferry and Fort Williams, commencing their delivery on the 1st of November, 1851, and continuing it at the rate of from 80 to 100 tons per week, until the whole quantity required (10,500 tons) shall have been delivered. They are to be inspected by Lewis Troost, Chief Engineer.

It is proper to state to iron masters and capitalists at a distance, that the country traversed by the Northern and part of the Southern divisions of the road abounds in excellent iron ore and bituminous coal, and possesses every advantage for the successful manufacture of iron, health, cheap labor and provisions.

Further information may be obtained by addressing the President of the Company at Selma, Ala.

By order of the Board of Directors.

J. W. LAPSLEY, President.

Floods of the Mississippi.

We copy into our present number a part of a very interesting article upon the characteristics of this great river, which cannot fail to receive attention. As the great river of North America, everything in relation to the Mississippi possesses an attractive interest; and all facts which can teach us to avoid the vast and destructive overflows which have been so common of late, are of the highest value.

To Contractors.

ALABAMA AND TENNESSEE RIVER R. R. SEALED Proposals will be received by the Directors of the Alabama and Tennessee River Railroad, at their office in Selma, until the 1st of November next, for the graduation, masonry and bridging of 56 miles of the Southern Division of said road, extending northwardly from Selma.

Plans and profiles may be inspected and specifications and information will be given at the office of the company in Selma, on and after the 15th of October next.

Twenty-six miles of this division were graded in 1839. This part of the division will require repairs to the road bed, and will be furnished anew with culverts and bridges.

The country embraced in this division is healthy, well watered, and possesses facilities for obtaining supplies of provisions.

Proposals may be based upon cash payments, or upon payments of a proportion, or of the whole of the work in stock.

The Directors reserve to themselves the right to accept or reject proposals as they may think proper for the interests of the company.

The Directors expect to have as much as twenty miles of the Northern Division, extending northwardly from the Coosa river in Shelby county, ready for examination by the 15th November, and for letting by the 1st December; and 30 miles more, ready for examination by the 1st and for letting by the 15th of January, 1851. It is likewise their intention to let out the grading, masonry and bridging of the remainder of the Southern Division and of the Northern Division terminating at Gadsden, with all possible despatch.

By order of the President and Directors.

LEWIS TROOST, Chief Engineer.
Selma, Ala., August 30, 1850.

Pure Iron Produced Directly from the Ore.

We perceive by the report of the Newark Daily Advertiser that Mr. Alexander Dickerson, of that place, has invented certain improvements in the formation of the puddling furnace, by which he is enabled to manufacture iron of superior quality, directly from the ore, by the use of anthracite or bituminous coal or wood.

Charles T. Jackson, M. D.,

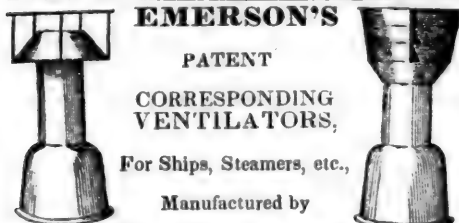
STATE ASSAYER, late Geologist to Maine, Rhode Island, New Hampshire, and the United States, offers his services to his friends and the public in making any Chemical, Mineralogical or Geological researches that may be required for the improvement of Agriculture and the Manufacturing Arts. Particular attention will be paid to the exploration of mines and to assaying of ores of the metals.

State Assayer's office, 31 Somerset st.
Boston Sept. 3, 1850.

To Railroad Companies and Mechanical Establishments.

A Person of considerable experience and practical knowledge in Mechanical, Civil and Marine Engineering, is anxious to meet with an engagement with either a Private Individual or Public Company, who may have works either to design or execute in the above branches of the Engineering Profession.

Address Z. Y., 47 Atlantic st., South Brooklyn, L. I.

**EMERSON'S**

PATENT

CORRESPONDING
VENTILATORS,

For Ships, Steamers, etc.,

Manufactured by

CHILSON, ALLEN, WALKER & CO.,
351 Broadway, New York.

Notice to Contractors.

COVINGTON & LEXINGTON RAILROAD.
Sealed Proposals will be received at the office of the Covington and Lexington Railroad Company, in the city of Covington, until the 10th day of September next, for grading twenty miles of the Covington and Lexington Railroad, commencing at Covington and extending up the valley of the Licking river. The proposals will include all the excavations, embankments, and masonry for culverts—also the masonry for bridges.

Plans and specifications of the work to be done, and the terms of payment, may be seen at the office of the company, at any time between the first and tenth of September.

SYLVESTER WELCH,
Engineer Covington and Lexington R. R.
Covington and Lexington Railroad Office,
July 21st, 1850.

Notice to Contractors.

SEALED PROPOSALS will be received at the office of the James River and Kanawha Company in Richmond, until the 1st day of October next, for the construction of the Piers and Abutments of the Bridges across James River at New Canton, Hardwickville and Bent Creek. This work will be paid for in cash. Besides the usual reservation of 20 per cent. on the monthly estimates, the contractor or contractors will be required to give ample security, satisfactory to the Board of Directors, for the completion of the work at the time and in the manner specified in the contracts.

Plans of the above works will be exhibited and specifications thereof delivered to the contractors at the office of John County, the Assistant Engineer in charge of the same in Columbia.

WALTER GWYNN,
Chief Eng. J. R. & K. Co.

August 16, 1850.

CUT NAILS OF BEST QUALITY, BAR IRON (including Flat Rails) manufactured and for sale by **FISHER, MORGAN & CO.,** 75 N. Water St., Philadelphia.

Great American Engineering

AND MECHANICAL WORK, just published in medium folio One Dollar, 75 cts. to Subscribers. Part VII of "Specimens of the Stone, Iron & Wood Bridges, Viaducts, Tunnels, Culverts, &c., &c., of the United States Railroads." By George Duggan, Architect and Civil Engineer.

The present part contains beautifully executed plans, elevations, sections and details of the elegant timber Bridge, (Burr's Patent,) 150 feet span, across Salmon River, Malone, on the line of the Northern-Ogdensburg-railroad, and isometrical views of Bridges 30, 40, 60, 82 and 88 feet span on the line of the Utica and Syracuse railroad, with specifications, form of contract, &c., &c., for the Connecticut River railroad.

"It is a work that was a great desideratum, and must prove of great benefit to the engineering profession generally, and especially to the tyro in practical engineering and mechanical knowledge; in truth it strikes us, that it would require years of labor and patient toil on the part of a young engineer to prepare the drawings, and collect the information that will be embodied in this work, and can now be secured for the trifling sum of \$9."—[Scientific Amer. March 16, 1850.]

In connection with this subject (Iron Railroad Structures) we take occasion to call attention again to Mr. Duggan's valuable and expensive publication, exhibiting drawings, with full descriptions of the various stone, iron and wooden bridges, viaducts, tunnels, culverts, etc., of all the Railroads in the United States. Mr. Duggan is an accomplished Architect and Civil Engineer, who came from Ireland to this country to exercise his profession; but finding railroad construction here, in many respects, different from that he had been accustomed to in Europe, he applied himself to the study of our system; and the fruits of his researches and investigations embodied in this work, are well calculated to meet the exigencies of engineers, and to assist draughtsmen, bridge builders, mechanics and students.—[N. Y. Journal of Commerce, Feb. 14, 1850.]

Published by **GEORGE DUGGAN,**
300 Broadway, New York.
To whom all communications should be addressed, and subscriptions forwarded.

**Gloucester Iron Works,
GLOUCESTER, NEW JERSEY,
NEARLY OPPOSITE PHILADELPHIA.**

THE subscribers having made extensive alterations in their works, are now prepared to receive orders for all kinds of Stationary and Marine Engines, Boilers, Locomotives, Sugar Mills, and every description of Mill Work.

Also—Orders for Iron and Brass Castings executed with despatch.

Having secured the valuable services of Mr. David Matthew as Superintendent (who has been for five years foreman in the Iron Works of John Watchman, now the Vulcan Works, Baltimore, and for 12 years superintendent of the Mohawk and Hudson and the Utica and Schenectady Railroads, New York,) they feel confident that all orders entrusted to them will be faithfully executed.

Having an extensive Wharf in front of their works, it will afford a safe harbor for all classes of steam vessels that may require repairs during the winter.

C. M. & J. C. SITER.
Gloucester, July 24, 1850. 1m.

Rosendale Cement.

THE NEWARK AND ROSENDALE LIME AND CEMENT CO. are now manufacturing at their works in NEWARK, N. J., and Ulster county, N. Y., a very superior article of *Hydraulic Cement*—also Lime Calcine Plaster, etc. Contractors and dealers will find it to their advantage to call or make application before purchasing elsewhere. All communications addressed to the subscriber, at Newark, N. J., will be punctually attended to.

1y*15 HENRY WILDE, Secretary.

MINING AGENCY.

Capt. O. H. Matthews,

Civil and Mining Engineer, F. G. S., London, etc.
HAVING completed his three years engagement on Lake Superior, is open to negotiate for another appointment as Mining Agent, or Superintendent of Mines. Also, to give his opinion and advice upon Mineral Lands, to Buyers and Sellers of Stock, or to be consulted on any section in this important branch of national industry.

The most implicit confidence may be relied on, and immediate attention given to all communications (pro paid). Address Capt. O. H. Matthews, Toronto, July 27th, 1850. 3m

Great Work on Bridge Building, etc., etc.

JUST published in medium folio, One Dollar, 75 cts. to subscribers.

Part I. of a "THEORETICAL AND PRACTICAL TREATISE ON THE CONSTRUCTION OF BRIDGES IN STONE, IRON AND WOOD," By George Duggan, Architect and Civil Engineer.

The present part contains beautifully executed plans, elevations, sections, and centering, of the Bridge of St. Maixence, France, by M. Perronet, the eminent Architect and Engineer, and plans, elevations, sections, and details of the oblique Timber Bridge, 700 ft. long, constructed for a double track across the River Tyne, on the line of the Newcastle and Carlisle railroad, by John Blackmore, C. E., with an introductory article on the relative merits of the various materials employed in the construction of Bridges, as regards economy, strength and durability, and critical remarks on the various forms of bridges designed and constructed by the most eminent architects and engineers in Europe and America.

"PART VI. of Specimens of the Stone, Iron and Wood Bridges, etc., etc., of the United States Railroads," By George Duggan, Architect and Civil Engineer, contains specimens of the plates and letter press intended for the APPENDIX, being the commencement of a complete Treatise on the Theory and Practice of Bridge Building. This will be one of the most valuable works on the subject ever presented to the attention of engineers in this country—condensing the most important information on this branch of architecture contained in the writings of the most eminent scientific men in the French, German, Italian, and English languages, in the course of the last and present century. It will be illustrated by numerous accurate representations of bridges of the greatest celebrity in modern times. Elaborate articles will be given on the strength, property, and uses of the different materials employed, and on the most approved methods of constructing Cofferdams, Foundations, Centering, etc., with descriptions and drawings of the various engines and Machines that were found most useful in constructing the works, and a selection of such specifications as may be of service to the practical bridge builder. The sixth number treats of the Application of Iron to Railroad Structures, and is illustrated by beautiful drawings of the Bridge across the Delaware at Saw Mill Rift on the Erie Railroad, and of the bridge over Fairfield street, on the Manchester and Birmingham Railroad. The great success of this work thus far is the best tribute to its scientific merit and its adaptation to the wants of the American engineer."—[New York Daily Tribune, June 23, 1850.]

Published by George Duggan, 300 Broadway, New York, to whom all communications should be addressed and subscriptions forwarded.

Parties remitting Mr. Duggan \$5. and the remainder \$4 when they have been supplied with the first six parts of the "Theoretical and Practical Treatise on Bridge Building, etc.," shall receive it monthly as published. To those making Mr. Duggan a present remittance of \$9, the work will be forwarded post free to any part of the United States.

**American Railway Guide,
AND POCKET COMPANION FOR THE
UNITED STATES;**

CONTAINING Correct Tables, showing the time for starting of trains from all stations, distances, fares, etc., on all the Railway lines in the U. States; also many of the principal Steamboat and Stage routes—accompanied by a complete RAILWAY MAP. Price, single copies 12½ cts., or \$1 per annum. Published on the first of every month, corrected from returns furnished by the Railway Superintendents throughout the Union.

This book has been compiled somewhat on the plan of Bradshaw's Guide, with such improvements in size, form and arrangement as have seemed desirable; and the publisher confidently hopes it will not be found liable to the objections of incompleteness and incorrectness, which have been made, and justly too, against various other similar works heretofore issued.

The subscriber having had the management of the NEW YORK PATHFINDER almost from its commencement, has enjoyed superior facilities in obtaining information relating to the thoroughfares of travel, and is therefore well qualified to prosecute with success the arduous undertaking of furnishing a complete and correct national guide book.

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WE are prepared to enter into arrangements for supplying our Cement for public works or other purposes. We warrant the cement equal in every respect to any manufactured in this country. It attains a great degree of hardness, sets immediately under water, and is a superior article for masonry coming in contact with water, or requiring great strength.

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February 16, 1850.
The above cement is used in most of the fortifications building by government.

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KUNS & BASELER, Mathematical Instrument makers, manufacture and keep for sale all kinds of mathematical instruments; also drawing instruments, scales and balances for the use of chemists, professional gentlemen, jewellers, etc., etc., of the most perfect description, at the lowest price, at 81 Nassau street, New York.

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Best Cast Steel Royal Improved Files, well known as better adapted for Engineers' and Machinists' purposes than any now in use in the United States.

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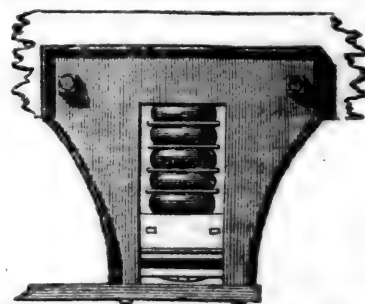
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Pig and other Iron also contracted for. Sole Agent for "Baxter's Machine and Burning Oil"—particularly adapted for "Railroads" and other Machinery—Preferred to Sperm by the many now using it, and 25 per cent. cheaper.

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CUMBERLAND SEMI-BITUMINOUS COAL
superior quality for Locomotives, for sale by
H. B. TEBBETTS,
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May 12, 1849.

FULLER'S PATENT INDIA RUBBER SPRING.

THESE SPRINGS ARE THE CHEAPEST,
the lightest and most durable of any yet known. They are easily applied to new or old cars, and there is small possibility of any accident occurring to them.

Other parties through Mr. Ray set up claims to an India Rubber Spring which, though the same in principle, is very inferior in its working and durability. Actions are in progress for an Infringement on Fuller's Patent against parties using that Spring.

The superiority of Fuller's Spring over that claimed by Mr. Ray is fully established and has frequently been testified to. The following are from gentlemen who have had much experience with both Springs.

"It will afford me pleasure to recommend your springs to the companies in this region, in preference to Ray's which I am confident are inferior in mechanical arrangement to yours."
JOHN M'RAE,
Engineer S. Carolina R. R., Charleston.

"I do not hesitate to allow you to say that I concur in Mr. M' Rae's opinion that Ray's springs are inferior in mechanical arrangement to Fuller's. I repeatedly expressed that opinion long before Mr. M' Rae had seen your springs (as I believe) and entertain it still."
WM. PARKER,
Gen'l Supt. of Baltimore and Ohio R. R.

Office of Sup't Norwich & Worcester R.R. Co. }
December 26, 1849. }

"I most fully concur in the opinion of Jno. M' Rae, Engineer of S. Carolina Railroad, that 'Rays Springs are inferior to Fuller's Springs;' and shall with pleasure recommend them to all Railroad Companies for adoption. I have used both springs on this road and have no hesitation in saying that I should in all cases prefer Fuller's Spring."

SAM'L H. P. LEE, JR.,
Sup't and Engineer.

Office B. & P. R. R. Co., }
Boston, 20th December, 1849. }

"This company have cars fitted up with both Ray's and Fuller's 'Metallic India Rubber Springs,' and do not hesitate to say that Fuller's arrangement is very much superior to Ray's."

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The following result has been obtained by experiment upon one railroad.

A set of Trucks fitted with Steel Springs cost	\$190-77	and weigh	2355 lbs.
The same with Fuller's Springs,	131-71	"	1911 lbs.
Difference,	\$59-06	"	444 lbs.

Not only is there an advantage in the cost, but owing to the great reduction in weight, the car can be made lighter throughout, and so an enormous saving in weight may be effected in a Train.

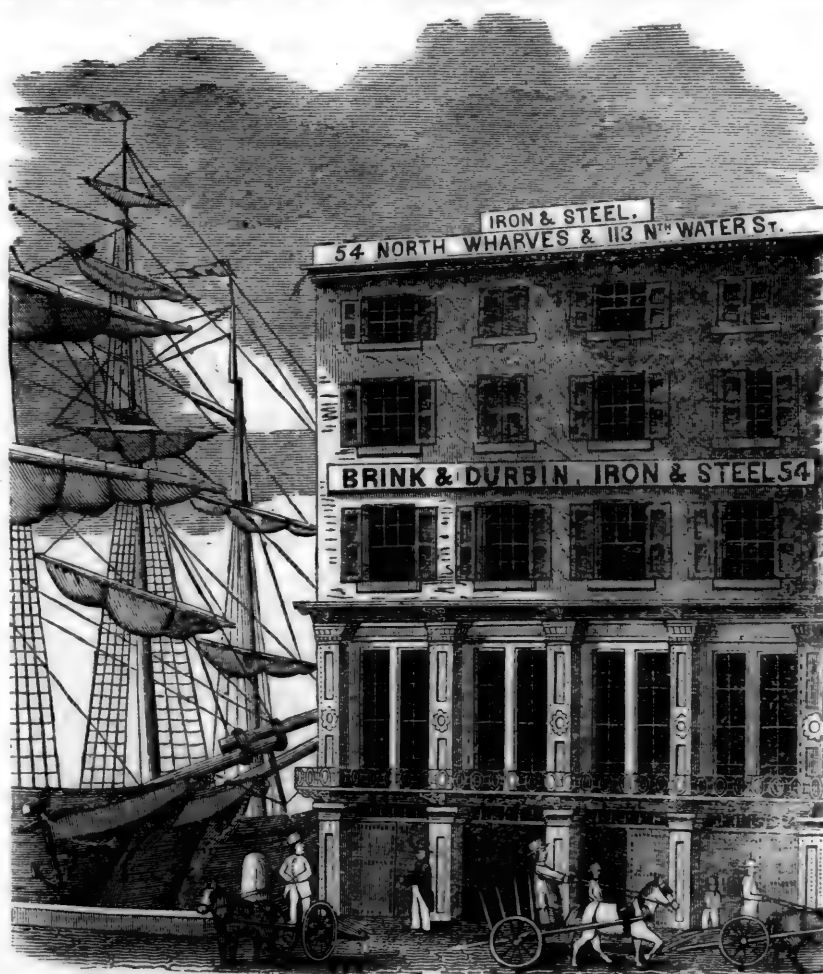
AGENTS.

G. M. KNEVITT, 38 Broadway, N. Y.,
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THE ADIRONDAC STEEL MANUFACTURING CO. is now producing, from American iron, at their works at Jersey City, N. J., Cast Steel of extraordinary quality, and is prepared to supply orders for the same at prices below that of the imported article of like quality. Consumers will find it to their interest to give this a trial. Orders for all sizes of hammered cast steel, directed as above, will meet with prompt attention.

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Clement, Wm. H.,

Little Miami Railroad, Cincinnati, Ohio.

Cozzens, W. H.,

Engineer and Surveyor, St. Louis, Mo.

Alfred W. Craven,

Chief Engineer Croton Aqueduct, New York.

Davidson, M. O.,

Eckhart Mines, Alleghany Co., Maryland.

Fisk, Charles B.,

Cumberland and Ohio Canal, Washington, D. C.

Felton, S. M.,

Fitchburg Railroad, Boston, Mass.

Floyd-Jones, Charles,

South Oyster Bay, L. I.

Gzowski, Mr.,

St. Lawrence & Atlantic Railroad, Montreal, Canada.

Gilbert, Wm. B.,

Rutland and Burlington Railroad, Rutland, Vt.

Grant, James H.,

Nashville and Chattanooga R. R., Nashville, Tenn.

S. W. Hill,

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Hewson, M. Butt,

Memphis, Tenn.

Holcomb, F. P.,

Southwestern Railroad, Macon, Ga.

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New York and Boston Railroad, Middletown Ct.

Latrobe, B. H.,

Baltimore and Ohio Railroad, Baltimore, Md.

Miller, J. F.,

Worcester and Nashua Railroad, Worcester, Mass.

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Schuylkill Navigation, Schuylkill Haven, Pa.

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Atlantic and St. Lawrence Railroad, Portland, Me.

McRae, John,

South Carolina Railroad, Charleston, S. C.

Nott, Samuel,

Lawrence and Manchester Railroad, Boston,

Prichard, M. B.,

East Tennessee and Georgia R. R., Cleveland, Tenn.

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Trenton, N. J.

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Ohio and Pennsylvania Railroad, Pittsburgh, Pa.

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Rahway, New Jersey.

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Panama Railroad—Address through office of Panama Railroad Co., 78 Broadway, N. Y.

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This Extensive Establishment, erected expressly for a Hotel, with every regard to comfort and convenience, is situated in the centre and most fashionable part of the city, and but a few minutes' walk from the Railroad Depots and Steamboat Landings.

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John Barstow, Esq., Providence.

Lewis Bullard, Esq., Boston.

February 9, 1880.

6m*

United States Railroad Guide and Steamboat Journal.

CONTAINING OFFICIAL TIME ADVERTISEMENTS, Tables of Stations, Distances, Fares, Time, etc., with much miscellaneous matter for the travelling public. Price 12 cents a copy. Yearly subscription \$1. Published at 43 Ann street, New York.

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Of all descriptions. Warranted Good

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Manufacturers of Machinists' Warranted Best Cast Steel Files, expressly for working upon Iron and Steel, made very heavy for recutting.

A full Stock of Steel and Files at all times on hand. 6m4

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CLEAN COP WASTE, suitable for cleaning Railroad, Steamboat and Stationary Engines, constantly on hand and for sale by

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3m

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ARE now receiving a large and complete assortment of Plain and Figured PLUSHES, of their own importation, which will be sold at the lowest market price, viz: Crimson, Maroon, Scarlet, Green, Blue, Purple, etc.

ALSO—CURLED HAIR, the best manufactured in market.

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AGENTS for the sale of Charcoal and Anthracite Pig Iron, Hammered Railroad Car and Locomotive Axles, Force Pumps of the most approved construction for Railroad Water Stations and Hydraulic Rams, etc., etc.

July, 27, 1849.

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Models of this Track, on the most improved plans, may be seen at the Engineer's office of the New York and Erie Railroad.

To Railroad Companies.**—WROUGHT IRON WHEELS—SAFETY AND ECONOMY.****NORRIS' LOCOMOTIVE WORKS, SCHENECTADY, NEW YORK,**

Are Manufacturing Wrought Iron Driving, Truck, Tender, and Car Wheels—made from the best American Iron. Address E. S. NORRIS.

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E. BROWN AND SON Mathematical inst. makers No. 27 Fulton Slip, New York, make and keep for sale, Theodolites, Levelling inst., Levelling rods, Surveyors Compasses, and Chains. Cases of Mathematical drawing insts. various qualities, together with a general assortment of Ivory Scales and small insts. generally used by Engineers.

Ranstead, Dearborn & Co.,MANUFACTURERS OF
LOCOMOTIVE CRANKS AND CAR AXLES,
ALSO**WROUGHT IRON SHAFTING,**

And All Kinds of Hammered Shapes.
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Also, Agent for the Manufacture of Telegraph Wire.
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GENUINE WICKESLY GRINDSTONES
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THEODOLITES, TRANSIT COMPASSES, and Levels, with Fraunhofers Munich Glasses, Surveyor's Compasses, Chains, Drawing Instruments, Barometers, etc., all of the best quality and workmanship, for sale at unusually low prices, by E. & G. W. BLUNT,
No. 179 Water St., cor. Burling Slip.
New York, May 19, 1849.

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3,000 TONS C. L. MAKE 63½ lbs. per yard, now landing and to arrive.
Also contracts made for future delivery of above superior make English Iron.
300 Tons Banks Best Iron, Round, Square and Flat.
200 " English Bar " " " "
10 " 9-16 Square Iron for Railroad Spikes.
For sale in lots to suit purchasers by DAVID W. WETMORE.
New York, March 26, 1850. 3m

Railroad Iron.

THE Undersigned, Agents for Manufacturers, are prepared to contract to deliver Rails of superior quality, and of any size or pattern, to any ports of discharge in the United States.

COLLINS, VOSE & CO.,
74 South St.

New York, June 1, 1850.

Railroad Iron.

1,500 Tons weighing 53 lbs. per lineal yard.
500 " " 57 " "
500 " " 56 " "
500 " " 60 & 61 lbs. "
Also 2½" flat rails. All the above being of approved patterns. For sale by DAVIS, BROOKS, & CO.,
68 Broad street.

N.B.—Rails imported on commission, or at a fixed price.

Iron.

Pig Iron, Anthracite and Charcoal; Boiler and Flue Iron, Spring and Blistered Steel, Nail Rods, Best Refined Bar Iron, Railroad Iron, Car Axles, Nails, Stove Castings, Cast Iron Pipes of all sizes, Railway Chairs of approved patterns for sale by COLEMAN, KELTON & CAMBELL,
109 N. Water St., Philadelphia.

IRONDALE PIG METAL, MANUFACTURED and for sale by the Bloomsburg Railroad Iron Co.
LINDLEY FISHER, Treasurer.
76 N. Water St., Philadelphia.

Railroad Iron.

2000 Tons, weighing 58 pounds per lineal yard, of the most approved pattern of T rails, in store and to arrive, for sale by COLLINS, VOSE & CO.,
74 South St.

New York, June 1, 1850.

Railroad Iron.

1650 Tons, weighing about 61 lbs. per yard, 40 tons, weighing about 52 lbs. per yard, and 825 tons, weighing about 53½ lbs. per yard, of the latest and most approved patterns of T rail, for sale by BOORMAN, JOHNSTON & CO.,
119 Greenwich street.

New York, Aug. 26, 1850.

N.B.—B. J. & Co are also prepared to take contracts for English rails, delivered in any of the Atlantic ports of the United States.

Railroad Iron.

THE UNDERSIGNED, HAVING made arrangements abroad, are prepared to contract for the delivery of Foreign rails, of approved brands upon the most favorable terms.

They will also make contracts for American rails, made at their Trenton works, from Andover Iron, in whole or in part, as may be agreed upon.

They are prepared to furnish Telegraph, Spring and Market Wire; Braziers and Wire Rods; Rivets and Merchant Bars to order, all made exclusively from Andover Iron. The attention of parties who require iron of the very best quality for special purposes, is respectfully invited.

COOPER & HEWITT,
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February 15, 1850.

Glendon Refined Iron.

Round Iron, Band Iron, Hoop Iron,
Square " Flat " Scroll "

Axles, Locomotive Tyres,
Manufactured at the Glendon Mills, East Boston, for sale by GEORGE GARDNER & CO.,
5 Liberty Square, Boston, Mass.
Sept. 15, 1849. 3m37

PATENT HAMMERED RAILROAD, SHIP & BOAT SPIKES.—The Albany Iron Works have always on hand, of their own manufacture, a large assortment of Railroad, Ship and Boat Spikes from 2 to 12 inches in length, and of any form of head. From the excellence of the material always used in their manufacture, and their very general use for railroads and other purposes in this country, the manufacturers have no hesitation in warranting them fully equal to the best spikes in market, both as to quality and appearance. All orders addressed to the subscribers at the works will be promptly executed.

JOHN F. WINSLOW, Agent.

Albany Iron and Nail Works, Troy, N. Y.
The above Spikes may be had at factory prices, of Erastus Corning & Co Albany; Menist & Co., New York; E. Pratt & Br. 1st, Eastmore, Md.

LAP—WELDED WROUGHT IRON TUBES

FOR

TUBULAR BOILERS,

FROM ONE AND A QUARTER TO SEVEN INCHES IN DIAMETER.

THE ONLY Tubes of the same quality and manufacture as those so extensively used in England, Scotland, France and Germany, for Locomotive, Marine and other Steam Engine Boilers.

THOMAS PROSSER & SON, Patentees,
28 Platt street, New York.**Railroad Iron.**

THE UNDERSIGNED ARE PREPARED TO contract for the delivery of English Railroad Iron of favorite brands, during the Spring. They also receive orders for the importation of Pig, Bar, Sheet, etc. Iron.

THOMAS B. SANDS & CO.,

73 New street,
February 3, 1849. New York.**Iron Store.**

THE Subscribers, having the selling agency of the following named Rolling Mills, viz: Norristown, Rough and Ready, Kensington, Triadelphia, Pottsgrove and Thorndale, can supply Railroad Companies, Merchants and others, at the wholesale mill prices for bars of all sizes, sheets cut to order as large as 58 in. diameter; Railroad Iron, domestic and foreign; Locomotive tire welded to given size; Chairs and Spikes; Iron for shafting, locomotive and general machinery purposes; Cast, Shear, Blister and Spring Steel; Boiler rivets; Copper; Pig iron, etc., etc.

MORRIS, JONES & CO.,

Iron Merchants,
Schuylkill 7th and Market Sts., Philadelphia.
August 16, 1849. 1y33**Railroad Iron.**

THE MOUNT SAVAGE IRON WORKS, Alleghany county, Maryland, having recently passed into the hands of new proprietors, are now prepared, with increased facilities, to execute orders for any of the various patterns of Railroad Iron. Communications addressed to either of the subscribers will have prompt attention. J. F. WINSLOW, President

Troy, N. Y.

ERASTUS CORNING, Albany;
WARREN DELANO, Jr., N. Y.JOHN M. FORBES, Boston.
ENOCH PRATT, Baltimore, Md.

November 6, 1848.

Railroad Iron.

THE SUBSCRIBERS ARE PREPARED TO take orders for Railroad Iron to be made at their Phoenix Iron Works, situated on the Schuylkill River, near this city, and at their Safe Harbor Iron Works, situated in Lancaster County, on the Susquehanna river; which two establishments are now turning out upwards of 1800 tons of finished rails per month.

Companies desirous of contracting will be promptly supplied with rails of any required pattern, and of the very best quality.

REEVES, BUCK & CO.
45 North Water St. Philadelphia,

March 15, 1849.

Monument Foundry.

A. & W. DENMEAD & SON.
Corner of North and Monument Sts.,—Baltimore,
HAVING THEIR

IRON FOUNDRY AND MACHINE SHOP

In complete operation, are prepared to execute faithfully and promptly, orders for Locomotive or Stationary Steam Engines, Woolen, Cotton, Flour, Rice, Sugar Grist, or Saw Mills, Slide, Hand or Chuck Lathes, Machinery for cutting all kinds of Gearing, Hydraulic, Tobacco and other Presses, Car and Locomotive patent Ring Wheels, warranted, Bridge and Mill Castings of every description, Gas and Water Pipes of all sizes, warranted, Railroad Wheels with best faggoted axle, furnished and fitted up for use, complete

Being provided with Heavy Lathes for Boring and Turning Screws, Cylinders, etc., we can furnish them of any pitch, length or pattern.

Old Machinery Renewed or Repaired—and Estimates for Work in any part of the United States furnished at short notice.

June 8, 1849.

Iron Wire.

REFINED IRON WIRE OF ALL KINDS.
Card, Reed, Cotton-flyer, Annealed, Broom, Buckle, and Spring Wire. Also all kinds of Round, Flat or Oval Wire, best adapted to various machine purposes, annealed and tempered, straightened and cut any length, manufactured and sold by

ICHABOD WASHBURN.

Worcester, Mass., May 25, 1849.

Wheel, Forge and Foundry Iron.

LOCUST GROVE Wheel Iron of great strength and superior chilling property.

Balt. Charcoal Forge Iron, from Patuxent, Curtis Creek and Gunpowder furnaces.

Elkridge Foundry Iron, of superior strength and softness. Anthracite and Charcoal Iron from Pennsylvania and Virginia. Gas and Water Pipes, Lamp Posts from Elkridge furnace.

LEMMON & GLENN,

6m9 62 Buchanan's Wharf, Baltimore.

S. S. Keyser & Co., IRON WAREHOUSE,

Corner of South and Pratt Streets,
BALTIMORE, MD.

Selling Agents for the Rough and Ready Bar Iron and Elk Boiler and Flue Iron Rolling Mills, Sarah and Taylor Furnaces, and Wrightsville Hollow Ware Foundry, and Dealers in Bar and Sheet Iron, and Cast, Sheer, German, Blister, Spring and Electroplated Steel, etc., etc.

Smith & Tyson,

GENERAL COMMISSION MERCHANTS,
No. 25 South Charles St., Baltimore, Md.

AGENTS for the Celebrated Columbia Pig Iron, suitable for Car Wheels and Chilled Ralls.

Columbia refined Charcoal Blooms; Refined Charcoal Junlatia Billet Iron for Wire; Refined Iron for Bridging, of great strength; Cut Nails, Spikes, and Brads; Railroad Spikes and Wrought Chairs. 22tf

Stickney & Beatty,

DEALERS IN IRON AND IRON MANUFACTURERS.

AGENTS for the Balt. City Rolling Mill, from which establishment they are prepared to furnish Ellicott's round, square, and flat bar iron, puddled and charcoal boiler plates and billet iron—also agents for the sale of the Laurel and Maryland (Balt.) charcoal forge pig irons, Balt. hard iron for chilling wheels, anti-Eatam nails, Catoctin foundry iron, boiler blooms from the Caledonian works, Wm. Jessop & Son's cast steel, Coleman's blister steel and nail rods, hoop, band, sheet, oval and common English iron.

Nos. 18 and 20 South Charles st., Baltimore.

Railroad Iron.

CONTRACTS made by the subscribers, agents for the manufacturers, for the delivery of Railway iron, at any port in the United States, at fixed prices, and of quality tried and approved for many years, on the oldest railways in this country.

RAYMOND & FULLERTON, 45 Cliff St.

Iron.

THE SUBSCRIBERS having resumed the agency of the New-Jersey Iron Company, are prepared to execute orders for the different kinds and sizes of iron usually made at the works of the company, and offer for sale on advantageous terms.—

150 tons No. 1 Bonton Foundry Pig Iron.
100 " No. 2 do. do. do.
300 " Nos. 2 & 3 Forge do. do.
100 " No. 2 Glendon do. do.
140 " Nos. 2 & 3 Lehigh Crane do. do.
100 " No. 1 Pompton Charcoal do.
100 " New-Jersey Blooms

50 " New-Jersey Faggoting Iron, for shafts
Best Bars, $\frac{1}{2}$ to 4 inch by $\frac{1}{2}$ to 1 inch thick.
Do do Rounds and Squares, $\frac{1}{2}$ to 3 inch.
Rounds and Squares, 3-16 to 1 inch.
Half Rounds, $\frac{1}{2}$ to 1 in. Ovals & Half Ovals $\frac{1}{2}$ to 1 $\frac{1}{2}$ in.
Bands, $\frac{1}{2}$ to 4 inch. Hoops, $\frac{1}{2}$ to 2 inch.
Trunk Hoops, $\frac{1}{2}$ to 1 $\frac{1}{2}$ in. Horse Shoe & Nut Iron.
Nail Plates. Railroad Spikes.

DUDLEY B. FULLER & Co., 139 Greenwich-st. and 85 Broad-st.

WILLIAM JESSOP & SONS' CELEBRATED CAST-STEEL.

The subscribers have on hand, and are constantly receiving from their manufactory,

PARK WORKS, SHEFFIELD,

Double Refined Cast Steel—square, flat and octagon. Best warranted Cast Steel—square, flat and octagon. Best double and single Shear Steel—warranted. Machinery Steel—round.

Best and 2d gy. Sheet Steel—for saws and other purposes.

German Steel—flat and square, "W. I. & S." "Eagle" and "Goat" stamps.

Genuine "Sykes" L Blister Steel.

Best English Blister Steel, etc., etc., etc.

All of which are offered for sale on the most favorable terms by **WM. JESSOP & SONS,**

91 John street, New York.

Also by their Agents—

Curtis & Hand, 47 Commerce street, Philadelphia.

Alex'r Fullerton & Co., 119 Milk street, Boston.

Stickney & Beatty, South Charles street, Baltimore.

May 6, 1848.

JOHNSON, CAMMELL & Co's Celebrated Cast Steel,

AND

ENGINEERING AND MACHINE FILES, which for quality and adaptation to mechanical uses, have been proved superior to any in the United States. Every description of square, octagon, flat and round cast steel, sheet, shovel and railway spring steel, best double and single shear steel, German steel, flat and square, goat stamps, etc. Saw and file steel, and steel to order for any purposes, manufactured at their Cyclops Steel Works Sheffield.

JOHNSON, CAMMELL & CO.,
100 William St., New York.

November 23 1849.

Railroad Iron.

THE Undersigned, Agents for Manufacturers, are prepared to contract for the delivery of English, Welsh and Scotch Rails, of any pattern and weight, also for every description of English, Welsh, Scotch, and Swedish Iron, Railway Chairs and Spikes, Rivets, Bolts, Nuts, Washers, Chain Cables, Anchors, Tin Plates, German Spelter, Iron Castings, and every description of Machinery.

WILLIAM BIRD & CO.,
Iron and Tin Plate Merchants,
44 Wall st., New York.

And at 5 Martin's Lane, City, London,
and 140 Buchanan st., Glasgow.

July 27th, 1850.

To the Proprietors of Rolling Mills and Iron Works.

THE Undersigned—Proprietors of Townsend's Furnace and Machine Shop, Albany—are extensively engaged in the manufacture of Machinery and fixtures for Iron, and Copper Rolling Mills, and Iron Works. Having paid particular attention to the manufacture of *Rolls* (Rollers), both *chilled* and *dry-sand*, they feel confident that they can execute orders for such castings in a satisfactory manner. And to give assurance of this, they beg leave to refer to the following named persons, proprietors and managers of some of the most extensive rolling mills in the country, viz: Jno. F. Winslow, J. Tuckerman, H. Burden, W. Birtt, J. & J. Rogers, Satus & Co., J. B. Bailey, L. G. B. Cannon, Hawkins & Atwater, etc., etc.

F. & T. TOWNSEND.

Albany, August 18, 1849,

Railroad Iron.

B. O. Railway Tires, Railway Wheels,
Scotch Pig Iron, Tin Plates and Banca Tin,
Muntz's Patent Metal Sheathing,
Baltimore Copper.

Contracts for Rails made on behalf of the manufacturers, for delivery at any ports in the United States, at fixed prices.

Bowling Tires and Tire Bars and Scotch Pigs imported to order.

Muntz's Ship-sheathing, and a general stock of Tin Plates and Banca Tin in store, and for sale by
RAYMOND & FULLERTON, 45 Cliff st.

Bowling Iron. Stamped B.O.

Railway Tire Bars Rivet Iron
Locomotive and other Axles Locomotive Frame do
Boiler Plates Bars,
and every other description of this superior Iron.

The subscribers, agents for the sale of Bowling Iron, are prepared to execute orders for importation, especially for railway and machinery uses, with despatch from the manufacturers.

RAYMOND & FULLERTON, 45 Cliff st.

Lovegrove's Patent Cast Iron Water and Gas Pipes.

THE Subscriber, the Inventor and Patentee of the Centrifugal mode of giving form to metallic substances while in a molten state, is preparing to make Cast Iron Water and Gas Pipes, of any dimensions, at prices much lower than they can be made in the old manner, and the pipes warranted to stand a pressure of three hundred pounds to the square inch, and to be soft enough to drill. Steam Engines and all kinds of machinery. Cast Iron Doors and Frames, and Mill Castings of every description, made to order.

THOMAS LOVEGROVE,

Machinist and Founder,

West Falls Avenue, below Pratt st., Baltimore.

Ray's Patent India Rubber Car Springs.

Savannah, Ga., May 22, 1850.

FOWLER M. RAY, Esq.,

Dear Sir: I have no hesitation in saying, after having used on our road your springs and Fuller's, that I consider yours decidedly the best in every particular, and in this opinion I am sustained by all our officers. Fuller's spring has a tendency to split, and also to chafe or abrade by the constant friction on the cast iron plates or disc: and in my opinion is not near so elastic as yours.

Your springs, which have been in use on our road for 12 or 15 months past, and in constant use under both passenger and freight cars, are to all appearances as elastic, sound and good, as when first put in use.

We are now building eighty-five new cars, of which for fifty-sets the springs have been ordered of you.

GEORGE A. ADAMS,

Master Carpenter,

Central Railroad and Banking Co. of Georgia.

Connecticut River Railroad Office,
Northampton, May 4, 1850.

E. CRANE, Esq.,

Dear Sir: It is now about two years since I first tried the experiment of using a set of Ray's India-rubber Springs upon one of our merchandise cars; and although the car has been in constant service since that time, I do not on examination find the slightest difference either in the thickness or elasticity of the material.

The same result has followed wherever we have applied them, either for wheel or draw springs on Engines, Tenders or Cars. At present we use no other; either in replacing old springs or building new cars—and I am perfectly satisfied that for economy, durability, safety, and ease of motion, that Ray's India-rubber is the best article for Springs which has been presented to the public.

Yours respectfully, **J. HUNT,**
Supt. Connecticut River Railroad.

EDWARD CRANE, Esq.,

Dear Sir: Having applied to cars of the Boston and Worcester Railroad Corporation, Ray's Vulcanised Rubber Springs (where they have been in use for some two years last past), I have had occasion to observe their operation, and am free to say in answer to your inquiries, that they retain their elasticity perfectly during all changes of atmospheric temperature: and are in my opinion a most valuable acquisition to Railroad Cars—are not liable to derangement, as is the case with steel springs; while at the same time it costs less to apply them. Respectfully yours,

D. N. PICKERING,

Supt. Motive Power, Bos. & Wor. Railroad,
Boston, April 18th, 1850.

FARMERS! ATTENTION!!

John Mayher & Co's
NEW AGRICULTURAL WAREHOUSE
AND SEED STORE,

197 WATER STREET, NEW YORK.
Where they have for Sale, the largest and most complete assortment of Farming Implements, ever offered for sale in this city—all of which they will sell 10 per cent. Cheaper than the same kind of Goods can be bought at any other house in the city. Our Goods are all Warranted to give satisfaction.

FARMERS wanting to purchase, will please call and examine our Stock before buying elsewhere.

Among our assortment may be found the Celebrated Highest Premium Eagle Ploughs! together with all the most approved Ploughs now in use.

Also,—Horse Powers, Threshing Machines, Fan Mills, Corn Shellers, Straw Cutters, Corn Mills, Seed Sowers, Churns, Ox Yokes, Ox Scrapers, Hay Rakes, Horse Rakes, Patent Chain Pump (that never freezes nor rusts), and other Pumps; in fact we have everything for Farming Purposes—together with Guano, Bone Dust and other Fertilizers.

JOHN MAYHER & CO.,
197 Water st., N. Y.

February 9, 1850.
N.B.—J. M. & Co. also continue their Old Stand, at 195 Front street, near Fulton Market.

**RAILROAD CAR
AND COACH TRIMMINGS.**
Doremus & Nixon,
IMPORTERS AND FURNISHERS

Plain Garnet Plush. Fig. Garnet Plush (Butterfly pat.
" Crimson " " Crimson " (Elegant.
" Scarlet " " " (Gen. Taylor.

BROCATELLES.

Crimson Silk Brocates. Gold and Maroon do.
Gold and Blue " " Brown "
Silk and Wool " of every color.

MOQUETTES,

Of elegant designs and colors.

GERMAN CLOTH FOR CAR LININGS.

The most beautiful goods ever shown in this country, and the subscribers are the sole agents for the sale of them.

Oil cloths Enamelled with Gold. } These goods can be
" " Silver. } furnished in any
Do. Silver ground velvet printed. } dimensions req'd.

CURLED HAIR

Of every description and quality.

JNO. W. A. STRICKLAND, Agent.
New York, 1850. 1716

FOWLER M. RAY'S
Patent India-rubber Railroad
CAR SPRING.

New York and Erie Railroad Shops.
Piermont, March 26, 1850.

This will certify that from practical experience in the use of Fowler M. Ray's India rubber Car Springs, I believe them to be far superior to any others now in use.

I have never known them to be affected by any change of temperature, as other Rubber Springs have been affected on this road.

I am at the present time repairing a Passenger Car that Mr. Ray and myself mounted with his springs about two years and eight months since.

The springs are at the present time as perfect, to all appearances, as when first applied to the car.

Respectfully yours,

HORACE B. GARDNER,
Foreman of the Car Shops.

Supt. Office N.Y. & H. R.R., }
New York, March 8, 1850. }

This is to certify that we have used the Rubber Springs manufactured by Mr. F. M. Ray for the past twenty months, "both for Passenger and Freight Car Springs and Bumpers, and of different sizes," and have in every case given entire satisfaction, and I consider them the best spring now in use

M. SLOAT, Supt.

Boston, March 5, 1850.

In answer to your enquiry about India-rubber Springs, I have to say that we have used them to a considerable extent on both freight and passenger cars, and also on several of our tenders; and I am very well satisfied that they answer all the purposes for which they are intended. I believe the India-rubber will soon supersede all other springs for cars and tenders.

Yours truly,

S. M. FELTON,
Supt. Fitchburg Railroad.

Office New Jersey Railroad Co., }
Jersey City, March 8, 1850. }

FOWLER M. RAY, Esq.,

Dear Sir: In answer to your enquiries respecting the operation of the Vulcanised Rubber Springs, purchased by our company from you some two years since, I reply that they are superior to any spring in use, (that I have either seen or heard of).

The improved form of your spring, consisting of a solid piece of vulcanised rubber with bands on the outside, is far superior to your first form, consisting of disks of rubber with metallic plates interposed.

The last named form was tried, if you recollect, at a much earlier period; and then was replaced by your last form.

I have no hesitation in saying that your springs have given entire satisfaction, and most cheerfully recommend them to railroad companies throughout the country for the following reasons:

1st. The cost is 30 per cent. less.
2d. Saving of weight on each car of 8 wheels from 700 to 800 lbs.

3d. Less care and attention is required, as they are not liable to get out of repair.

4th. A great saving is secured in the wear and tear of the cars and rails from their great elasticity.

5th. The freedom from noise.

6th. There is greater safety in case of accident, as they cannot be broken.

7th. The comfort of passengers is enhanced sufficiently to pay the expense, waiving all the other reasons that I have given.

Should this fail to satisfy any person enquiring, you are at liberty to refer to me, No. 150 Washington St., Jersey City. Yours respectfully,

T. L. SMITH, Supt.

New York, March 11, 1850.

I have used the Patent India-rubber Spring purchased of Mr. Ray, upon the cars of the New York and New Haven Railroad, and have found them efficient and economical; and when applied to the axles and draw springs, believe them to be quite equal to any in use. I have found a combination of these springs with a steel spring under the transom beam a very satisfactory arrangement, and am now using this plan in all new cars.

Yours respectfully,

ROBERT SCHUYLER.

February 25, 1850.

From practical observation of the use of the India-rubber Car Springs, manufactured and sold by your company, we are entirely satisfied in their application, and do not hesitate to recommend them as elastic, durable, requiring no repairs for years, and retaining their consistency during all extremes of weather. We have applied them for the past two years, and consider them superior for all railroad purposes.

Yours truly,

OSGOOD BRADLEY, Car Builder, Worcester.
T. & C. WASON, do. Springfield.
DEAN, PACKARD & MILLS, do. do.
DAVENPORT & BRIDGES, do. Cambridgeport.

Office of the New Jersey Railroad Co., }
Jersey City, March 7, 1850. }

This is to certify that we have had Mr. F. M. Ray's India-rubber Springs in constant use under our cars, and as Bumper Springs for upwards of two years, and they have in every way given perfect satisfaction.

The present form of spring we deem far superior to the form of Disk, having used both forms, although we have none of those made in Disks at present in use.

We take pleasure in recommending these springs to all railroad companies.

J. P. JACKSON, Vice Prest.
New Jersey Railroad and Trans. Co.

Roxbury, February 28, 1850.

In compliance with your request, I take great pleasure in stating the result of my experience in the use of "Ray's Patented Vulcanised India-rubber Car and Engine Springs." We have used them nearly two years, and never had one fail in any way. The cold weather does not affect them, as it has other rubber springs we have used.

With sixteen years' experience as superintendent of machinery on the Boston and Providence railroad, I take pleasure in saying that your springs are the best we ever used, or I ever saw used elsewhere. We have 20 cars rigged with them, of which I can say that the springs are as good now as when first applied. I put 24 lbs. of the rubber under the forward end of one of our heaviest engines, taking off 250 lbs. of steel springs—it has been in use 18 months; and is in as good condition now as when first put under the engine.

Very respectfully yours,

GEO. S. GRIGGS,
Supt. of Machinery, Boston and Prov. R.R.

Fall River, February 2, 1850.

In answer to yours of the 20th ult. I would say that this company has for some 10 or 12 months past been using "Ray's India-rubber Springs." We have applied them to both passenger and freight cars with uniform success. They have invariably preserved their elasticity and consistency through all the extremes of weather; and we are now applying them whenever the steel spring fails. I am well satisfied that they are particularly adapted for railroad purposes.

Very respectfully yours,

GEO. HAVEN,
Supt. Fall River Railroad.

Jersey City, March 9, 1850.

This is to certify that the present form of Mr. F. M. Ray's India-rubber Car Spring I consider far superior to the form of Disk, having used both forms.

I take pleasure in recommending these springs to all railroad companies. **DAVID H. BAKER,**
Foreman of Car Shop of N.J. R.R. & Trans. Co.

Harlem R.R. Depot, }
New York, March 7, 1850. }

This is to certify that we have used Mr. F. M. Ray's India-rubber Springs for over eighteen months, and find them to be easy and durable, and recommend them to railroad companies as being superior to anything we have tried.

J. M. SMART,
Foreman at 42d St. Depot.

Old Colony Railroad Office,
Boston, March 6, 1850.

EDWARD CRANE, Esq.,

President New England Car Co.,

Dear Sir: In compliance with your request I would state that the Old Colony Railroad Comp'y have had in use upon their road, India-rubber Springs furnished by your company, for more than eighteen months past, during which time they have been extensively used under Passenger and Freight Cars, Locomotive Tenders, and for Drawer and Buffing Springs, with the most perfect success. The elasticity and consistency of the Rubber has never been unfavorably affected by either extremes of heat or cold—and from the experience which we have had in the use of Rubber Springs, I think them well adapted for railroad purposes—and therefore we have for some months past used Rubber almost exclusively, in all places where springs are required.

Respectfully yours, etc.,

JAS. H. MOORE,
Supt. O. C. Road.

Troy, February 27, 1850.

We have been using your India-rubber Car Springs for nearly two years—and we take pleasure in saying that in our opinion the rubber has to a certain extent already, and may eventually entirely supersede all other Springs for Railroad Car purposes. We now use it entirely for Draw Springs and Bumpers, considering it better and lighter than steel.

During our two years' experience in the use of it, we have not known any to lose their elasticity, or fail in any way; and we cheerfully recommend the rubber for railroad car springs. Very respectfully,

EATON, GILBERT & CO.

Passenger Car Linings.

THE Advertiser continues to make to order the Enamelled Car Linings which have been so highly approved the last three years, and are now exclusively used by all the Northern Railroads. No pains are spared to get out new styles, and adapt them to the tastes of every consumer.

Orders addressed to **CHARLES STODDER, No. 75 Kilby street, Boston,** will have prompt attention. March 23, 1850. 2m

India-rubber for Railroad Cos.

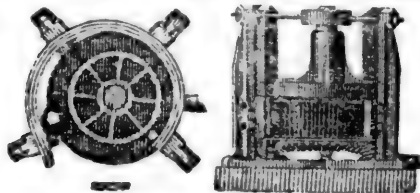
RUBBER SPRINGS—Bearing and Buffer—Fowler's Patent—Hose from 1 to 12 inches diameter. Suction Hose. Steam Packing—from 1-16 to 2 in. thick. Rubber and Gutta Percha Bands. These articles are all warranted to give satisfaction, made under Tyer & Helm's patent, issued January, 1849.—No lead used in the composition. Will stand much higher heat than that called "Goodyear's," and is in all respects better than any in use. Proprietors of railroads do not be overcharged by pretenders.

HORACE H. DAY,
Warehouse 23 Courtlandt street.

New York, May 21, 1849.

Spikes, Spikes, Spikes.

ANY person wishing a simple and effective Spikes Machine, or a number of them, may be supplied by addressing **J. W. FLACK,**
Troy, N. Y.
March 6, 1850.

MACHINERY.**Henry Burden's Patent Revolving Shingling Machine.**

THE Subscriber having recently purchased the right of this machine for the United States, now offers to make transfers of the right to run said machine, or sell to those who may be desirous to purchase the right for one or more of the States.

This machine is now in successful operation in ten or twelve iron works in and about the vicinity of Pittsburgh, also at Phoenixville and Reading, Pa., Covington Iron Works, Md., Troy Rolling Mills, and Troy Iron and Nail Factory, Troy, N. Y., where it has given universal satisfaction.

Its advantages over the ordinary Forge Hammer are numerous: considerable saving in first cost; saving in power; the entire saving of shingler's, or hammerman's wages, as no attendance whatever is necessary, it being entirely self-acting; saving in time from the quantity of work done, as one machine is capable of working the iron from sixty puddling furnaces; saving of waste, as nothing but the scoria is thrown off, and that most effectually; saving of staffs, as none are used or required. The time required to furnish a bloom being only about six seconds, the scoria has no time to set, consequently is got rid of much easier than when allowed to congeal as under the hammer. The iron being discharged from the machine so hot, rolls better and is much easier on the rollers and machinery. The bars roll sounder, and are much better finished. The subscriber feels confident that persons who will examine for themselves the machinery in operation, will find it possesses more advantages than have been enumerated. For further particulars address the subscriber at Troy, N. Y. P. A. BURDEN.

Railroad Spikes and Wrought Iron Fastenings.

THE TROY IRON AND NAIL FACTORY, exclusive owner of all Henry Burden's Patented Machinery for making Spikes, have facilities for manufacturing large quantities upon short notice, and of a quality unsurpassed.

Wrought Iron Chairs, Clamps, Keys and Bolts for Railroad fastenings, also made to order. A full assortment of Ship and Boat Spikes always on hand.

All orders addressed to the Agent at the Factory will receive immediate attention.

P. A. BURDEN, Agent,
Troy Iron and Nail Factory, Troy, N. Y.

CHILLED RAILROAD WHEELS.—THE UNDERSIGNED are now prepared to manufacture their Improved Corrugated Car Wheels, or Wheels with any form of spokes or discs, by a new process which prevents all strain on the metal, such as is produced in all other chilled wheels, by the manner of casting and cooling. By this new method of manufacture, the hubs of all kinds of wheels may be made whole—that is, without dividing them into sections—thus rendering the expense of banding unnecessary; and the wheels subjected to this process will be much stronger than those of the same size and weight, when made in the ordinary way.

A. WHITNEY & SON,
Willow St., below 13th,
Philadelphia, Pa.

Brown's Old Established SCALE WARE HOUSE,

NO. 234 WATER ST., NEW YORK.

THE Subscriber, Practical Manufacturer of Scales of every description, respectfully asks the attention of Railroad Companies to his Improved Wrought Iron Railroad Track and Depot Scales which for strength, durability, accuracy, convenience in weighing, and beauty of workmanship, are not surpassed by any others in this country.

He is aware that this is rather a bold assertion for him to make, yet he can say with confidence that they have but to be tried to give them precedence over all others.

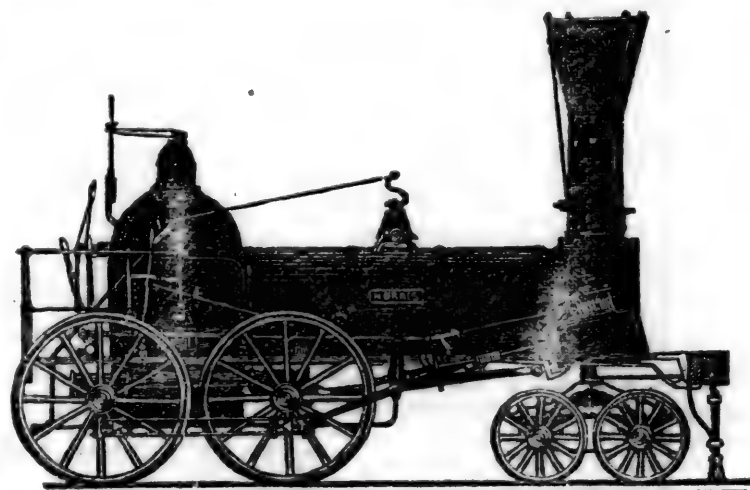
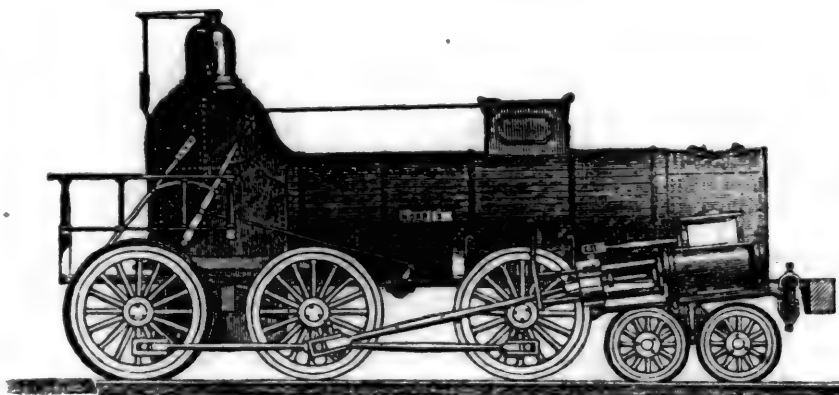
J. L. BROWN.

Bank Scales made to order, and all Scales of his make Warranted in every particular.

References given if required

NORRIS' LOCOMOTIVE WORKS.

BUSHHILL, SCHUYLKILL SIXTH-ST., PHILADELPHIA,



THE UNDERSIGNED Manufacture, to order Locomotive Steam Engines of any plan or size. Their shops being enlarged, and their arrangements considerably extended to facilitate the speedy execution of work in this branch, they can offer to Railway Companies unusual advantages for prompt delivery of Machinery of superior workmanship and finish.

Connected with the Locomotive business, they are also prepared to furnish, at short notice, Chilled Wheels for Cars of superior quality.

Wrought Iron Tyres made of any required size—the exact diameter of the Wheel Centre, being given, the Tyres are made to fit on same without the necessity of turning out inside.

Iron and Brass castings, Axles, etc., fitted up complete with Trucks or otherwise.

NORRIS, BROTHERS

PATENT MACHINE MADE HORSE-SHOES.

The Troy Iron and Nail Factory have always on hand a general assortment of Horse Shoes, made from Refined American Iron.

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November 3, 1849.

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To Inventors and Patentees.

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AMERICAN RAILROAD JOURNAL.

STEAM NAVIGATION, COMMERCE, MINING, MANUFACTURES.

HENRY V. POOR, Editor.

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American Railroad Journal.

PUBLISHED BY J. H. SCHULTZ & Co., 136 NASSAU ST.

Saturday, September 14, 1850.

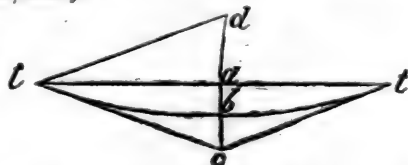
For the American Railroad Journal. Remington's Bridge.

A good deal has been said and published in the newspapers about the "Remington bridge;" and doubtlessly many have supposed a great improvement, depending on newly discovered principles, to have been effected and brought to light in its construction.

It is obvious enough, however, to those versed in such matters, that nothing new as to principle has been developed—the structure being simply what is technically called a suspension bridge, supported by wooden stringers, instead of iron chains or wire cables which are usually employed in that species of bridge; and further differing from the ordinary suspension bridge, in having the stringers drawn more nearly to a horizontal line, so that the platform or flooring rests upon, and follows the line of the stringers, instead of being suspended below them.

Now, the stringers in this condition are obviously subjected to stress according to the well known laws of statics, and to show approximately what the stress is, it will be sufficiently correct, for the slight curvature here supposed, to regard the curve as a circular or a parabolic arc; and if tangents be drawn from the two extremities of the curve, they will meet as far below the centre of the arc, as that part of the curve is below the chord of the arc;—and a load uniformly distributed over the length of the arc, will produce the same tension upon the stringers (at the ends,) as if the stringer were to follow the line of the tangents, and the whole load, including the weight of the stringer, were concentrated at the point where the tangents meet. Moreover, the amount of stress is to the weight of the load, as the length of either of the tangents is to twice the perpendicular from the intersection of the tangents to the chord of the arc, or four times the perpendicular from the chord to the lowest point in the curve. This can readily be illustrated by a diagram,* and may be reduced to the following for-

* Let t, b, t' , be the curve, and t, c, t' the tangents. Join t, t' , and draw c, a , perpendicular to t, t' , also draw t, d , parallel to c, t' , and meeting c, a , produced in d ;—then, $cb=ba$, nearly, and $cd=2ca=4ab$, nearly.



Now, suppose a weight w , placed at c , and sustained by the two lines or chains ct, ct' , the points t and t' being in the same level—the tension of these two lines, and the gravity of the weight w , being three forces in equilibrio, are to one another as the three sides of the triangle c, t, d , whose sides are parallel with the directions of the three forces, (see Mechanics) i.e., the stress of ct , and ct' , arising from the weight w , is to the said weight w , as the length of ct or ct' is to cd , or $2ca$, or $4ab$, and calling ct , (or tb , which may be regarded as the same, in this approximation and for slight curvature) l ,—representing ab by d , the stress by s , and the weight by w , the proportion will stand, $s : w :: l : 4d$, whence $4sd = lw$ and $s = \frac{wl}{4d}$.

Now the tension of these tangents is the same as would be the tension of the extremities of the arc tbt' , with the same weight w distributed uniformly over the length of said arc.

formula: $s = \frac{wl}{8d}$, in which s represents the stress, l the length of stringer, d the deflection, or distance of the chord from the lowest point of the curve, and w the load uniformly distributed over the arc, including the weight of the stringer.

Now applying this formula to a stringer in which $d = \frac{l}{50}$, we have, by substituting this value of d , $s = \frac{wl}{8 \times \frac{l}{50}} = \frac{50w}{8} = 6.25w$, showing the stress upon the stringer to be six and a quarter times as great as the distributed load supported by it.

This about the case of Mr. Remington's model in which he says three stringers one inch square sustained 14 tons, or $4\frac{1}{2}$ tons to each stringer, which being substituted for w , gives the stress equal to $6.25 \times 4\frac{1}{2}$ tons = 27.166 tons, a stress nearly sufficient to break one square inch of good wrought iron, and enough to break five square inches of good white oak.

The conclusion, then, is irresistible, that my formula is sadly incorrect, or that there must be some mistake as to the fact of Mr. Remington's three stringers of one inch square, sustaining 14 tons with a deflection of only one fiftieth part of their length.

But the formula, though not strictly correct, is essentially so for moderate curvatures; and for a deflection equal to one eighth of the length, it probably does not vary more than ten per cent. from the truth, and the less the deflection the nearer correct is the formula in about a duplicate ratio.

It is to be observed, moreover, that the stress is not the same in different parts of the stringer, being greatest at the ends, and least in the centre, the difference being as the length of the two tangents to that of the chord, or, for a deflection of 1 to 8, the difference is about 12 per cent., and a little less than 8 per cent. for a deflection of 1 to 10, which is seldom exceeded in suspension bridges.

Now, those who can, may believe that Mr. Remington's stringers are not subject to the established laws of statics, and that, as he enunciates, "a piece of timber may be made to sustain, when in nearly a horizontal position, nearly the same weight as is

necessary to separate its fibres"—meaning, as I take it, with the timber suspended by one end, and the weight hung at the other.

The proposition is only true when the deflection of the stringer is nearly equal to $\frac{1}{4}$ of its length, and the weight which the stringer will bear is proportionally less, as the deflection is less than $\frac{1}{4}$ of the length. With a deflection of 1 to 50 the stringer will bear, as we have seen above, less than one-sixth of what it would bear if suspended by one end.

I understand Mr. Remington's 436 ft. bridge in Alabama to be 10 feet wide, and from one to one and a half, say one and a quarter inches thick, and containing 150 square inches of cross section in the centre, with a deflection of ten feet. Now, supposing the pieces so united as to form a solid plank of ten feet wide by $1\frac{1}{4}$ inches thick, it would, at the most, be capable of sustaining a tension of 12,000 lbs. to the square inch or $150 \times 12000 = 1800000$

lbs. equal to s , in the formula $S = \frac{wl}{8d}$ and substituting also 436 feet for l , and 10 for d , we have

$1800000 \text{ lbs.} = \frac{436 w}{80}$ whence $w = 330275 \text{ lbs.} =$

the utmost capacity of the bridge, including its own weight.

Now, no prudent engineer would estimate these stringers to bear with safety a stress of over 2000 lbs. to the square inch, even if the splittings were as strong as the sound parts, and in truss bridges generally, the chords, or bottom stringers do not bear a tension of over 500 lbs. to each square inch in the aggregate cross section. But allowing Mr. Remington's stringers, on account of their superiority of timber and splicing, to be safe with four times that amount of stress, or 2000 lbs. to the inch, we have in this case, about 55,000 lbs. as the safe load of the bridge, including its own weight.

The planks are understood to be 6 inches thick at the ends of the bridge, (without any apparent good reason for the great difference from the ends to the centre,) and supposing them to average 3 inches over the whole area of 436 by 10 feet gives 1090 cubic feet, which, if of white oak, would weigh some 50 lbs. to the foot, or 54500 lbs.

Thus it will be seen that the stringers may sustain their own weight, and a trifle more, if the splittings are perfect, with tolerable safety, and might possibly sustain over 100 tons, without supposing any new principles or new discoveries in mechanics, which the structure manifestly does not develop.

S. WHIPPLE.

Railroad Law of New Hampshire.

AN ACT IN AMENDMENT OF THE LAWS IN RELATION TO RAILROAD CORPORATIONS.

Continued from page 561.

Doings During the Year.—Miles run by passenger trains; miles run by freight trains; miles run by other trains; total miles run; number of passengers carried in the cars; number of passengers carried one mile; number of tons of merchandise carried in the cars; number of tons of merchandise carried one mile; number of passengers carried one mile to and from other roads; number of tons of merchandise carried one mile to and from other roads; rate of speed adopted for express passenger trains, including stops; average rate of speed actually attained by the express passenger trains, including stops and detentions; rate of speed adopted for accommodation trains; rate of speed actually attained by accommodation trains, including stops and detentions; average rate of speed actually attained by special trains, including stops and detentions; average rate of speed adopted for freight trains, including stops and detentions; estimated

weight, in tons, of passenger cars (not including passengers) hauled one mile; estimated weight, in tons, of merchandise cars (not including freight) hauled one mile.

Expenditures for Working the Road.—For repairs of road, maintenance of way, exclusive of wooden bridges and renewals of iron; for repairs of wooden bridges; for renewals of iron, including laying down; for wages of switchmen, average per month; for wages of gate keepers, average per month; for wages of signal men, average per month; for wages of watchmen, average per month; for wages of conductors, average per month; for wages of ticket masters, average per month; number of men employed, exclusive of those engaged in construction; for removing ice and snow, (this item to include all labor, tools, repairs, and extra steam power used;) for repairs of fences, gates, houses for signal men, gate keepers, switchmen, tool houses; total for maintenance of way.

Motive Power and Cars.—For repairs of locomotives; for new locomotives to cover depreciation; for repairs of passenger cars; for new passenger cars to cover depreciation; for repairs of merchandise cars; for new merchandise cars to cover depreciation; for repairs of gravel and other cars; total for maintenance of motive power and cars; number of engines; number of passenger cars; number of merchandise cars; number of gravel cars.

Miscellaneous.—For fuel used by engines during the year, namely, wood and coal; for oil used by engines and cars; for waste and other material for cleaning; for salaries, wages, and incidental expenses chargeable to passenger department; for salaries, wages and incidental expenses, chargeable to freight department; for gratuities and damages; for taxes and insurance; for ferries; for repairs of station buildings, fixtures, furniture; for amount paid other companies in tolls for passengers and freight carried on their roads, specifying each company and the amount to each; for amount paid other companies as rent for use of their roads, specifying each company and the amount to each; for salary of president; for office expenses; for salary of treasurer; office expenses; for salary of superintendent; for office expenses; number of legal counsel retained, and amount paid them; number of actions in court each year in which the corporation is a party, the expense of each action, the nature of the controversy, and the amount in question; all other expenses not included in the foregoing items; total miscellaneous; total expenditure for working the road.

Income During the Year.—For passengers—1. On main road, including branches owned by company. 2. To and from other roads, specifying what, and amount from each. For freight—1. On main road and branches owned by company. 2. To and from other connecting roads, and amount from each; United States mails; rents; interest; from all other sources; total income; net earnings, after deducting expenses.

Dividends.—Per cent, total; surplus not divided; surplus last year; total surplus.

Estimated Depreciation Beyond the Renewals, namely:—Road and bridges; buildings; engines and cars.

Estimated Increased Value Beyond Depreciation, namely:—Road and bridges; buildings; engines and cars.

Number of Free Passengers the Last Year, namely:—Number of directors and officers (except superintendent) of the corporation when not engaged in the immediate management of the cars and care of the road; number of persons connected with and in the employment of other corporations; number of other persons, except stockholders when attending meetings of the corporation.

SEC. 11. If any railroad corporation shall violate any of the provisions of this act, or shall permit any such violation, for which violation no mode of punishment is provided, such corporation shall be liable to an action upon the case in the name of any party injured thereby, to recover his damage, and shall also be liable to indictment and fine not exceeding one thousand dollars for each offence. And if any officer, agent, or servant of any railroad corporation shall knowingly violate any of the provisions of this act, where no other remedy is provided against such officer, agent, or servant, he

shall be liable to indictment and fine not exceeding one hundred dollars, according to the nature and aggravation of the offence.

SEC. 12. Each passenger over any railroad shall be entitled to have taken with him by the same train, as part consideration of the fare paid by him, a reasonable amount of personal baggage, exclusive of specie and bills: Provided, that no road shall be required to carry such baggage to an amount valued beyond one hundred dollars without notice being given and extra charges paid for such risk and liability, and such corporation shall be liable for the safe transportation and delivery of all such baggage at the station for which the same was received, or for the payment of the value thereof, if they neglect or refuse to pay for such baggage as aforesaid, on demand, after the expiration of said thirty days.

SEC. 13. Whenever any land may have been or shall be entered upon and taken for the construction of a railroad, any party shall appear entitled to any estate, right, or interest in or charge affecting said land which was not adjusted by purchase or appraisal thereof at the time of the laying out and construction of said road, in such cases said land, on petition to the railroad commissioners, may be laid out and appraised in the same way and manner as is provided for the original laying out and appraisal of land, and if the road is in operation, it shall not be obstructed in the use of said land after written application has been made to the commissioners to lay out the same, and notice thereof has been served on the land holders, until such appraisal shall be made.

SEC. 14. This act shall take effect and be in force from and after the first day of August next.

Indiana.

Railway from Lawrenceburgh to Indianapolis.

We learn from the Lawrenceburgh Register that the engineers are again engaged in locating the line between Shelbyville and Indianapolis, with a fair prospect of a direct and easy line. Efficient men are engaged to obtain additional subscriptions to the stock. The lettings exceed thirty-four miles. The work progresses fairly—the grade on eight miles, except in a few places, is nearly completed. Some of the heavy work, bridging, &c., proceeds well. Offers are made for nearly all the work that is to be let, on terms that are highly favorable to the company, as well as to price as to payments. The first division, it is expected, will be ready for the iron next spring, and the second, with branches to Columbus and to Shelbyville, by the spring following; making the entire length of the line completed nearly ninety miles.

MEMOIR ON THE PHYSICS OF THE MISSISSIPPI RIVER, BY CALEB G. FORSHEY, C. E.

Continued from page 529.

Application of Statistics and Principles.

17. Reasoning *a priori*, the following inductions and conclusions seem unavoidable:

A. The channel of the river is made by the abrasive force of its waters. A greater force would produce a greater channel; and a less force a less channel.

B. The greater the channel, the less the liability to overflow.

C. Concentration of force increases abrasive power, and diffusion of force reduces it.

D. Levees confine and concentrate the waters, concentrate and increase the force, therefore increase the abrasion, therefore the capacity of the channel.

E. Outlets diffuse the water, reduce the abrasive force, and therefore reduce the capacity of the channel.

F. If the channel be already greater than necessary for its servitudes, it would be safe to relieve it of some of its grooving force by outlets.

G. If the channel be too small for its servitudes, it would be wise to increase the channel making power, by closing outlets.

18. The Mississippi discharges a given quantity annually, and this is divided into daily supplies,

with a maximum here, in April and May. It can produce no more.

A. If this supply be discharged with a great velocity, it must maintain a lower level, even if the channel remains unchanged; for there can be no more than the supply to be discharged, and hence the volume discharged in a month or year must remain the same.

B. A greater force, with the same volume, implies a greater velocity.

C. Therefore, the levees which confine the waters and concentrate the force, increase the velocity and depress the level of discharge.

19. By reference to diagram M and table C, we shall find these inductions, a priori, sustained by the facts.

A. From the year 1817 to 1827, there were no considerable levees about the mouth of Red river.—From 1827 to 1837, levees were being extended the whole length of Concordia coast, say 250 miles.—And from 1837 to 1847, we may regard the system of levees as in full operation, for a long distance above and below the point of observation at Vidalia.

B. During the first ten years, 1817 to 1827, the mean height of the river's surface was, for the first year, 6 inches above the mean height of the following ten years, 1827 to 1837, while levees were being constructed; and 9 inches higher than the mean height of ten years, 1837 to 1847, under the levee system. This relates to the mean annual height, and is reduced to the range of Carrollton.*

C. But the mean high water mark of these decennial periods is in like manner reduced, being 4 inches lower, in the second, than the first period, and 6 inches lower in the third period.

D. But we have from the dates of highest water a very unexpected result—namely, the date of highest water is later in the second and third periods than the first.

The mean dates of culmination are for Vidalia, April 26, April 30, and May 15, for the three periods, in their order, and the mean of the 30 years is on May the 7th.

E. The common impression, that levees produce earlier high waters, would appear to be unfounded—and this is the conclusion which it seems to me would be arrived at, from section 18, A, B, C; because the supply cannot be increased or hurried before the rains and thaws of the spring, and our levees can have little effect in hastening the dates of highest water at any point within the influence of levees. The mean dates of culmination as given here, then, only prove to me, that the periods observed are too short to obtain a fair mean, when the range is from March 13th to July 16th.

20. *Cut-offs.*—By application of the principles and reasonings to facts, we shall find—

A. That a cut-off shortens the channel, increases the declivity, accelerates the velocity, strengthens the channel making power, abrades the banks and bottom with more vigor, and ultimately produces a lower mean level than before the cut off.

B. Accordingly, the effect of Shreeve's cut off, at the mouth of Red river, presented in 1844† these phenomena, namely: at the cut off the water was 3 feet, or more lower than the water mark of 1828. Twenty miles above, it was 30 inches lower, 40 miles up, it was 14 inches lower; at Vidalia, 60 miles above, it was 7½ inches lower, and at Water Proof, 90 miles, it was 3 inches lower, and at points above Water Proof it was regarded as equal to 1828.

C. At Morganza, it was 18 inches lower, and at New Orleans and Carrollton full 8 inches lower than in 1828.

These facts were determined by myself at the time, and since, and carefully noted.

D. We may conclude, hence, that the effect was perceptible about 100 miles above, and at least 200 below a cut off, abridging the distance of current 18 miles, and 354 feet to the fall of water, thence

* The difference of the mean height at Vidalia would be more properly considered. The six inches at Carrollton was about 20 inches at Vidalia, and the 9 inches equal to 30 inches, where the range is 51 feet.

† In all these comparisons I regard the river as having been of the same height, when not locally affected in the years 1823, 1828, 1844, and 1849.

to the gulf; and that it showed a reduction of high water level both above and below the cut off.

21. The Raccourci cut off has been too recently made, for a full illustration of the effects. Some have already been severely felt. It shortened the distance 38 miles, with a fall at high water of 4½ feet. The effect in draining the district above it have been realised as anticipated. Its effect at Vidalia was about 4½ inches, and expired at a distance of about 100 miles. Below it has not had time to produce the new channel due to its acceleration, and has raised the water probably in a slight degree, but not to the mark of 1828 at Bayou Sara, by 2½ inches. By the best information I can obtain, the difference is about two inches in the bend above Carrollton. By changing points of greatest force, and by increase of that force, it has committed great ravages upon the banks, both above and below the cut off. It will require but two or three years more, judging from past experience, to adapt the new channel to the new channel maker, when the whole will be discharged at a lower level than before the cut off.

22. The matter, as a question of hydrostatics, is settled that a cut off will reduce the level of discharge on both sides; and the question of policy reduced to one of cost from abrasion of banks.—This should be well weighed, before making a cut off, from the suddenness with which a new force is applied. Levees are extended so gradually, that the consequences are slow in being felt, and may be guarded against.

23. *Regimen of Rivers.*—It has recently been advanced by Dr. Riddell, that the river has some normal regimen, and that the effects of a cut off were to continue the carving in the bends of the river, until its channel shall obtain its former length, and regain its normal regimen.

A. I am not aware of any law or laws of currents, whether sediment bearing or clear, which will warrant such doctrine. Inert matter can certainly have no choice of greater or less velocity.

B. The greater the momentum, of course, the greater the power to remove obstacles—and all bends are obstacles.

C. The weaker a fluent, the easier diverted from its course, and hence the tortuousness of streams with little fall.

D. The aggregate tendency of a river, with alluvial banks, of uniform power to resist abrasion, is to straighten its channel.

E. No banks are uniform in this respect, and hence no stream attains or maintains a straight channel. But the power to approximate straightness is increased with the greater declivity, and increased force gained by a cut off.

24. A. *State of Levees and their Servitudes.*—The levees of Louisiana may be regarded as in full operation for 50 years, for about 100 miles from Bayou Lafourche down below the city. These levees have an average height no greater than those now being erected in the upper portion of the State; and the highest water marks known, whether within the levied districts or without, are no higher than many points of the land; and some of the best river plantations present long reaches *without levees*.

B. The river then has not raised its bed, nor reached a point of elevation, in recent years, greater than its level when it deposited those high grounds.

C. To maintain levees in future, then, we shall have to raise them no higher than in the past.

25. A. The location of levees below Baton Rouge was chiefly made before those farther above, and consequently were placed too near the bank to admit of the new abrasions, arising from cut offs, from extended levees, and from the never ceasing steamboat waves.

B. For this reason they are now being destroyed by caving banks and by lashing waves.

C. A period has arrived, when these new elements have cut away the small battures; and the high waters which the geology of this alluvion shows to have been frequent, geologically speaking, in past ages, are recurring, and our levees are wholly unequal to the task of restraining the waters. There are those who are not croakers, that have foreseen these disasters; but their warnings have not been heeded; good levees have not been erected. *The law in this respect has never been enforced.*

26. The management of levees has been in the hands of those least capable of enforcing the law.

The districts have been determined by parish boundaries, and not as they should be by the topography of the grounds.

The vigilant have often been inundated, from the negligence of their neighbors.

These considerations, and not any defect in the principle, have caused a distrust in the levee system.

27. *What is the Remedy for Overflows?**—I would suggest to lay off the State into levee districts, indicated by the topography of the grounds, and of each district make sub-districts in like manner, with guard levees running back between them.

Let the districts be large enough to occupy the time, attention and professional labor of a surveyor of levees.

Let there be a chief engineer of levees, whose duty it shall be to survey and define these districts, and to nominate to the governor the district engineers, and to be responsible for their acts, and his own, in heavy bonds.

Let the whole and sole control be placed in his hands, with plenary powers to enforce the law respecting work upon the levees, and to draw from a fund created for that purpose, to have the work performed whenever the planter is delinquent.

Let the levees be erected, in all cases, one arpent from the river, and two or three arpents whenever ascertained to be necessary, by a hydrographic survey of the river. The proprietor having to make such levees in front as may be desirable or necessary to his interest.

28. Let the levee be at least 25 feet wide on the summit, and the public road placed on it, whenever the levee is not more than 5 feet high.

When the levee is higher let the crest be at least 8 feet wide, protected from travel; its base 60 feet, and the public road, on its side at least, 4 ft. above the level of the land, on its river margin, and incline thence 25 feet to the gutter, at the level of the land. Let the road be made of batture sand and it will always be practicable.

With such a levee, located, governed, and constructed as above, with the professional pride of the engineer, and his heavy bonds to quicken and render him vigilant, I have great confidence the country could be maintained free from inundations.

Without a levee system under State government, I have no hope for a remedy for the disasters, now so common and so overwhelming.†

Waste Weirs and Debouchures.—Since this memoir was in progress of preparation, a series of questions have been addressed to me by the joint committee on overflows, levees, and drainage, of the legislature.

The principles and views I have expressed answer most of these queries.

And my opinion of the effects of a waste weir at Bonnet Carre, or elsewhere, has been asked; and although my general conclusions are readily inferable from this paper, there are some details worth stating.

The objections are found in articles 17 and 18, as given above, that it would weaken the force of the current, at the bars of the river, and in the channel. All this force is needed; for the bars soon fill up on diverting the waters and weakening the force.

For many years the Northeast pass was the principle channel of commerce, and ships of 15 or 16 feet water passed the bar. Its depth now is about 8 feet, and 11 feet is the greatest depth a vessel can carry over the bar going out. Meantime the Southwest pass has opened, and after several months of high water cutting at the bar, a ship (the Colum-

* I treat this part of my subject professionally, and not as a legislator. It is for the legislature to provide ways and means. Let any one calculate how many miles of such levee as I propose could be built with the money lost the past year by inundations.

* A thorough topographic survey of the State, as a part of a general geological and scientific survey, would enable the State to distinguish the bonnety between alluvions and upland, and thus to levy a just tax upon lands liable to inundation, for the purposes of leveeing and draining them.

Shall we wait longer for the development of the resources of the State, while others are reaping the rich rewards of the few thousands spent in a scientific survey?

bia) was brought up over the bar, with nineteen feet of water. This is probably the greatest depth ever brought over against the current.

Three or four years since a cut off was made by nature and the oystermen, 25 miles above the Balize, discharging the water into the West Bay. In July, 1849, I measured and found the New Pass, called Wilder's Bayou, 1500 feet wide, and 60 feet deep near the south shore. Since that time the Northeast Pass has been closing with a new rapidity, and promise is given of a new channel to the gulf.

But every new channel closes some previous one, or affects and injures all others.

The objection made by some, that a waste weir at Bonnet Carré would fill the lake, and first flood with water, and next fill up the bed with sediment.

Both these objections I think groundless—first, because a few inches elevation of the water enables it to spread over an outlet several miles wide; and second, because a volume equal to one tenth part of the whole river discharged into the lake would not deposit more than one foot per century.

Nor is there much danger, in my opinion, of a waste weir wearing a channel, even with the 19 feet fall of water from the river to the lake, at Bonnet Carré.

But I am confident that the channel below would soon adapt itself to the diminished force, and there would be little or no reduction of level.

And it is certain that it would accelerate the velocity above, and increase the ravages upon the banks for 20 or 30 miles above.

Let us be careful in future how we tamper with the Mississippi river. He is a tyrant too ungovernable to be trifled with. We know too little of the physics of the river to make experiments at present; and that will be the wisest legislation which directs effort to solve its thousand unknown traits, and meantime relies upon long tried methods more powerfully and strongly applied in the future.

Without any particular theory to maintain or interest to subserve, by the adoption of a particular policy, more than the common interest of a citizen, I submit these views and facts, trusting that they may be of value at the present crisis, but perfectly ready and willing to see them entirely superseded and forgotten, whereinsoever they are not sustained by reason and truth.

To the Honorable, the Senate and House of Representatives, of the United States in Congress.

The undersigned, citizens of the State of Virginia, most respectfully represent, that, being deeply impressed with the vast importance, considered either in a political, commercial, or social aspect, that the valley of the Mississippi, below the mouth of the Ohio river, should be connected by a railway, on the shortest and most eligible route, with the Tide Water cities of the Chesapeake Bay and its tributaries, commenced in 1846, to make efforts for the speedy construction of this great national thoroughfare. In 1847, an act of incorporation was granted by the Legislature of this state, to construct a railway from the valley of James river at Lynchburg, to the state-line in Washington county.—Since that time, a company has been organized, the entire route surveyed, and found, not only practicable, but of easy execution, when it is recollected that the Blue Ridge Mountains and the great Alleghany chain are both passed. Sixty miles of this road are now under contract, and in rapid progress of construction. Stimulated by this movement in Virginia, and being thereby awakened to a proper appreciation of the subject, the Legislature of Tennessee has given its sanction for the continuation of the Virginia line of railroad through the entire length of the state, terminating at Memphis. The Legislature of Virginia, in the winter of 1848-9, authorised the construction of a railway from Alexandria to Gordonsville, a point on the Virginia Central railroad in Louisa county. This road is likewise in progress of construction. The distance from Gordonsville to Lynchburg is 98 miles, and from Alexandria to Washington city 10 miles; thus leaving but one hundred and eight miles of the entire line from the Federal Capital to Memphis, which is not now under legal organization and in progress of construction.

Your memorialists believe, that the enterprise in

which they have embarked, will encourage agriculture; promote manufactures and commerce; facilitate a free and general intercourse between the different parts of the United States; tend to the aggrandizement and prosperity of the whole country, and greatly strengthen the bonds which unite the confederacy. They venture, therefore, to solicit your favorable consideration of the prayer of this, their petition.

The construction of a railway from the Federal Capital to the centre of the valley of the Mississippi, is an object of such transcendent importance, that every enlightened citizen and legislator must contemplate its accomplishment with solicitude. To attempt even an enumeration of the benefits to be acquired by the United States from the construction of such a work, would not be admissible in a memorial to Congress. The undersigned must, therefore, rely, and they do with confidence, upon the wisdom of your honorable body, for a just appreciation of the magnitude of the subject they present for reflection and action; contenting themselves with a few general reflections very briefly urged.

If we consider the extent and fertility of the public lands west of the Mississippi, the larger portion of which is yet unsold, the disposition and ability of the people east of that river, (to say nothing of millions who are anxiously awaiting in Europe to enjoy the blessings of free government,) to purchase it; we cannot be insensible to the great pecuniary advantage which must result to the federal treasury from opening to those lands a safe, speedy and economical highway. Every dollar saved to the emigrant from the states east of the "Father of Waters," or from Europe, would operate to enhance the value of the public domain, and it is obvious that a railway from Washington city, through Virginia and Tennessee, would save a large portion of the expenses now incurred in reaching the valley of the Mississippi, below and southwest of the mouth of the Ohio, because it is shorter by more than 100 miles than any other route. Whatever adds to the value of the products of agricultural industry, must increase the value of the land itself. To a country remote from the markets of export, or the places of consumption, it is of the first importance that it should have every possible facility of transportation; because all that is taken from the transit charges, is profit on capital and labor employed in agriculture. This is true also in reference to the imports, and thereby the landholder who has cheap transportation, enjoys a twofold advantage in every increased facility afforded him. Your memorialists confidently believe that the whole country, west of the Mississippi, and south and southwest of the mouth of the Ohio, would enjoy, from the completion of a line of railway from the tide water of the Chesapeake to Memphis, greater advantages than any country so far inland, ever derived from any similar line of intercommunication. These are views confined merely to pecuniary considerations; but your memorialists are indeed more impressed with the political influences which the establishment of this great national thoroughfare will assuredly exert. Nothing is clearer to the minds of your memorialists than that the continuance of our union is essential to the preservation of our liberty as a people; and they believe that now the means of its continuance are only to be found in the strength of our common interests. Can any thing be imagined more conducive to this end than the construction of a railway that shall unite distant sections of country, by offering the facilities of a rapid and profitable intercourse? By the construction of this railway, half of the United States would have more ample means of promoting every social interest, than have heretofore been furnished to the people of any other country—by the accomplishment of any similar enterprise—confidently entertaining these opinions and being unable to perceive any good and valid reason why Congress should not make grants of public lands, to aid in the construction of railroads leading to the unsold public domain, as well as to railways passing through it, your memorialists respectfully ask that an appropriation of two millions of acres of public lands, lying west of the Mississippi river, may be granted and vested in the Virginia and Tennessee railroad company; the better to enable that company

to construct that part of this great national thoroughfare, between the valley of James river at Lynchburg, and the state line in Washington county.

Your memorialists are aware, that hitherto the Congress of the United States has not given any of the public lands to aid in the construction of either railways or canals, except where the proposed improvement passed through the lands thus appropriated. To the policy, thus to aid in the more rapid settlement and development of the immense territory held by the United States, your memorialists offer no objections; but on the contrary, would beg leave to express their decided approval. They would at the same time repeat the suggestion made above; that to them it seems difficult to offer arguments to sustain a policy already adopted, viz to make donations of alternate sections of public lands to aid in the construction of lines of intercommunication, passing through those lands, which may not be used with equal force in support of the prayers of this petition.

Shall it be said that the lands west of the Mississippi will be enhanced in value because railways are made to pass through them, thereby cheapening the transportation both of export and import trade, facilitating the intercourse of the people who may reside on the lands, expediting the transit of the mail, affording a certain and rapid line of military communication between distant points of the country in time of war? Will not the construction of railways east of the Mississippi, leading to the very terminus it may be of the lines of railway west of that river, and offering the most direct and least costly line of communication with the Atlantic markets of export and consumption, and places most assailable by European nations, exert the same influences in a much greater degree? Surely they will. Your memorialists repeat, that they are at a loss to conjecture any considerations, that should induce Congress to aid in the construction of lines of intercommunication in the new states where there are unsold lands, that do not apply with fully as much force, to sustain the extension of like aid to similar applications coming from the states in which there is not unsold public domain, unless indeed it be assumed that the new state have a better right to, and can with propriety appropriate the common property of all the states to their exclusive use and benefit.

As Virginians we might urge considerations against such an assumption of right, if attempted to be enforced, with more show of reason and justice, than could be offered by the citizens of other states, but will not urge an appeal to the generosity of Congress, to sustain the prayer of our memorial, whilst we regard it as amply sustained by other considerations, more fitting to govern the deliberation and influence the decision of your honorable body. Your memorialists confidently anticipate the prayer of this, their petition, will be granted, because their fellow citizens in other states have had granted to them, what we ask should be conferred upon the Virginia and Tennessee railroad company. To expect any other decision, would be to doubt the justice and wisdom of the Legislature of the Union.

New Inventions and Discoveries in Photography and the Talbotype.—Sir D. Brewster, in his inaugural address, the other day, to the British Association at Edinburgh, said, I need not inform this meeting that the art of taking photographic negative pictures upon paper was the invention of Mr. Fox Talbot, a distinguished member of this association. The superiority of the Talbotype to the Daguerreotype is well known. In the latter the pictures are reverted, and incapable of being multiplied, while in the Talbotype there is no reversion, and a single negative will supply a thousand copies, so that books may now be illustrated with pictures drawn by the sun. The difficulty of procuring good paper for the negative is so great, that a better material has been eagerly sought for; and M. Niepce, an accomplished officer in the French service, has successfully substituted for paper a film of Albumen, or the white of an egg spread upon glass. This new process has been brought to such perfection that these Talbotypes were universally regarded as the finest that had yet been executed. Another process, in which gelatine is sub-

stituted for albumen, has been invented, and successfully practised. Mr. Edmund Becquerel has succeeded in transferring to a Daguerreotype plate the prismatic spectrum, with all its brilliant color; and also, though in an inferior degree, the colors of the landscape. These colors, however, are very fugacious; yet, though no method of fixing them has yet been discovered, we cannot doubt that the difficulty will be surmounted, and that we shall yet behold all the colors of the natural world transferred by their own rays to surfaces both of silver and paper. But the most important fact in photography is the singular acceleration of the process discovered by M. Niepce, which enables him to take the picture of a landscape illuminated by diffused light in a single second, or at most in forty seconds. By this process he obtained a picture of the sun on albumen so instantaneously, as to confirm the remarkable discovery previously made by M. Arago, by means of a silver plate, that the rays which proceed from the central parts of the sun's disc have a higher photogenic action than those which issue from its margin.

Canal Navigation by Steam.

A number of scientific gentlemen and others attended yesterday evening to witness the trial of a model canal boat, which was made in the Washington canal, near the Seventh street bridge. The canal boat, of which the one under trial is the model, is called Bond's propeller, and was patented in 1849. The model boat was propelled by steam yesterday across our canal, where it is one hundred feet wide, in forty-three seconds. The boat seemed to move handsomely; causing, however, some ripple at her head. We understand that the trial previously made on the Schuylkill the same model boat was propelled one hundred and five yards in fifty-one seconds. We understand there is a boat now on the Delaware worked by Bond's propeller that is forty feet in length; and another is being built sixty feet in length, which is intended to be run on the Rappahannock canal. The trial of yesterday was witnessed by a number of citizens, and seemed to give general satisfaction.—*National Intelligencer.*

Gold Mining in Canada.

The Quebec Chronicle mentions that a company has been formed, and is now engaged in working the gold mines recently discovered in the seigniory of Vandrenil, in the county Beauce. It says:—

"The yield is continuous, and for the most part regular, the net profits of the company now engaged in extrication being about £5 per day. But in addition to this return from the sifting of the auriferous gravel, there are lucky hits—times when a piece of the precious metal of some considerable size is met with. We have this very day seen a piece weighing over one quarter of a pound, as pure as if it had been taken from the smelting pot—that is to say, unmixed with gravel or vitreous quartz, or any other foreign substance. Were this the only piece of any considerable size that had been found it would signify little; but it is neither the first nor the second, the third nor the fourth. There have been many valuable pieces found, and there seems to be every prospect of finding more."

Steam Haulage on Rivers and Canals.

An experiment has lately been tried, with complete success, on the Gloucester and Berkley Canal, of a somewhat novel steam tug for hauling vessels instead of horse power. It consists of a continuous flexible rail or bar of iron running the whole length of the canal, and made fast at each terminus. Above the deck of the tug are fixed a pair of rollers, between which this flexible iron band is placed, and as they are made to revolve by the steam engine on board, the grip which they take propels the boat. On the trial in question, after hauling various small craft of from 70 to 80 tons burden, she took in tow a Greek brig, laden with corn to the amount of 350 tons, which she towed against a head wind to the dock entrance, at a good walking pace. She hauled the common canal boats at a rate of 6 miles an hour, the speed being but little affected when going against tide. The cost of hauling in the Severn is a heavy item in the transit of goods, and this invention is calculated to diminish the expense 50 per cent., the con-

sumption of coal being only 25 lbs. per hour.—*C. E. & A. Jour.*

Telegraph Between England and France.

The Paris correspondent of the National Intelligencer states that "the wires of the electric telegraph are at last laid across the channel, connecting England with the continent, from Shakspeare's Cliff, one mile S. W. of Dover, to Cape Gnez, about 12 miles S. W. of Calais. The distance is 18 miles but the wires are 23 miles long, to allow for the inequalities of the bottom upon which they lie. The correspondent adds that the first experiments made with the apparatus, long used between New York and Philadelphia, have completely succeeded, and the line will soon be opened to public use; a strictly limited use, however, and of which the inevitable Minister of the Interior holds the reins in his hands."

Oregon Coal.

We have been shown by Mr. Benjamin Reynolds of this city, and have now in our office a specimen of coal taken from a vein recently discovered upon the Columbia river, near the Willamette. We are informed that it exists in great quantities, and is in a situation to be readily got out. The piece we have in our possession is a portion of the upper strata, and consequently cannot be so pure as the lower strata. It has the appearance of cannel coal. The resources of Oregon appear to be developing themselves.

Depths of the European and Open Seas.

In the neighborhood of the continents the seas are often shallow; thus the Baltic sea has depth of only 120 feet between the coasts of Germany and those of Sweden. The Adriatic, between Venice and Trieste, has depth of only 130 feet. Between France and England the greatest depth does not exceed 300 feet, while southwest of Ireland it suddenly sinks to 2000 feet. The seas in the south of Europe are much deeper than the preceding. The western basin of the Mediterranean seems to be very deep. In the narrowest parts of the Straits of Gibraltar it is not more than 1000 feet below the surface. A little further towards the east the depth falls to 3000. On the northwest of Sardinia, bottom has been found at the depth of nearly 5000 feet. With respect to the open seas, their depths are little known. About 250 miles south of Nantucket the lead has been sunk to 7,800. In north latitude, at 76 degrees, Capt. Ross has exceeded 6,000 feet in Baffin's Bay. But the most astounding depths are found in the Southern Atlantic; west of the Cape of Good Hope 16,000 feet have been found, and the plummet has not found bottom at 27,000 feet west of St. Helena. Doctor Young, relying upon the theory of the tides, considered himself justified in assigning about 15,000 to the Atlantic, and about 20,000 to the Pacific.

Baltimore Ship Building.

A Splendid Launch.—The new ocean steamer "Monumental City," was launched on Saturday afternoon about six o'clock from the ship yard of Mr. John A. Robb. She was to have been started at an earlier hour, but, from some cause, she stuck upon the ways and could not be got off for some time. When she did move, however, she glided into her destined element most gracefully; and moved upon its surface like a swan floating gently upon some quiet lake. The "Monumental City" is intended for the Pacific trade; she is owned by Captains Hugg and Norris, G. A. V. Spreckelsen, Esq., Robert Garret & Co., — Wilson of the firm of Wilson, Young & Co., Kirkland, Chase & Co., and Peter Strobel, Esq. She was constructed under the immediate superintendence of Captains Norris and Hugg and Mr. Strobel, the former of whom goes out in her as Captain; and the latter as Agent. She is 185 feet in length, 30 feet beam, 15 feet depth of launch; and from the beauty of construction and durability of materials used, as well as the rapidity with which she was built—being on the stocks but four months, from the time the keel was laid until she was launched—cannot fail to add to the high character already sustained by her builder for ability in his line of business.

After the launch a splendid collation, set out by Mr. James E. Collins, in his very best style, was partaken of by the workmen and a number of in-

vited guests; where all present could not fail to have enjoyed themselves, and more especially those who had borne the "burden of the day."

The Mineralogy of Louisiana.

The Harrisonburgh Advocate gives an account of the minerals collected by Dr. James Holliday of that town. It was from this immediate vicinity that the Monument block was quarried. We inspected this cabinet several years ago, and it contains many beautiful mineral and geological specimens. Its greatest interest, however, is derived from the fact that they are all collected from one locality—Agates, Cornelians, Amethysts, and others of the quartz family, and with those are found the Eucronites, Madrepores and other petrifications. None of them are found *in situ*, but are diminutive boulders. They are in fact strangers, though their migration is beyond the range of human computation.

They are found on the high grounds on both sides of the Mississippi river, but not a pebble as large as a pea can be had for love or money in the alluvial lands. Natchez, under the bill, and the high bluffs on the Ouachita, in the town of Harrisonburgh, are the richest localities, but they are properly scattered over the pine woods as far west as the Sabine. They all bear marks of attrition, and are rounded like stones on the sea shore; they are found in the drift, which was brought down from the mountains, when this great valley was covered with water, and a strong current poured down into the gulf, but with these rocks of the oldest age, which were created prior to any organic formation, are found the lilies and other remains of the early flora, hardened into stone; and the oldest shells, the first evidence of organic life. What train of far extending speculation is called forth by these discoveries.—*N. O. Crescent.*

Flax Made to Resemble Cotton.

However much the following method may now admit of simplification, it is very interesting to see how much cotton was esteemed formerly in relative value, and how much skill and capital have had to do with its present general development.—In the *Sedish Translations*, for the year 1747, a method is given of preparing flax in such a manner as to resemble cotton in whiteness and softness, as well as in coherence. For this purpose a little sea water is to be put into an iron pot or untinned copper kettle, and a mixture of equal parts of birch ashes and quick lime strewed upon it; a small bundle of flax is to be opened upon the surface, and covered with more of the mixture, and the stratification continued till the vessel is sufficiently filled. The whole is then to be boiled with sea water for ten hours, fresh quantities of water being occasionally supplied in proportion to the evaporation, that the matter may never become dry. The boiled flax is to be immediately washed in the sea by a little at a time, in a basket, with a smooth stick, at first while hot; and when grown cold enough to be borne by the hands, it must be well rubbed, washed with soap, laid to bleach, and turned and watered every day. Repetitions of the washing with soap expedite the bleaching; after which the flax is to be beat, and again well washed; when dry, it is to be worked and carded in the same manner as common cotton, and pressed between two boards for 48 hours. It is now fully prepared and fit for use. It loses by this process nearly one-half its weight, which is abundantly compensated by the improvement made in its quality.

Virginia.

A meeting was recently held in Alexandria to take into consideration the subject of internal improvements in this State. It was addressed by W. M. Burwell, Esq., of Bedford, a well known advocate of railroads, from whose address we make the following extract, showing the distance between Washington and Memphis by the new line of railroad which Virginia in conjunction with other States, is now endeavoring to construct:

Mr. Burwell stated that the distance from Memphis to Chattanooga is 310 miles. It is well known that a company is organized to construct this road and has now a cash subscription of \$1,500,

000. From Chattanooga to Knoxville the distance is 110 miles. The road is in an advanced state.—A company has also been organized and \$675,000 subscribed to build a railroad from Knoxville to the Virginia line, a distance of 120 miles; that the route has been surveyed, and 44 miles of it put under contract. A company has been organized to build a railroad from Lynchburg to the Tennessee line, a distance of 215 miles, and \$760,000 subscribed by individuals, and \$900,000 by the State, with an obligation on the part of the state to subscribe *pari passu* to an amount sufficient to complete the whole work; 60 miles of this road has been put under contract, and English iron bought at about \$42 per ton to lay the track—80 miles more it is expected will be put under contract in October.—The resources of the country, with the aid of the state, it is believed, are fully adequate to the completion of the whole work within a short time.

From Lynchburg to Charlottesville is about 65 miles. No company has as yet been incorporated to construct a railroad between these two points.—From Charlottesville to Gordonsville, a distance of 20 miles, there is now a railroad connection in full operation.

A company has been organized to build a railroad from Gordonsville to Alexandria, a distance of about 89 miles and 60 miles of it is now under contract to be finished by the 1st of January, 1852.

From Alexandria to Washington in 8 miles.—The whole distance from Memphis via Lynchburg to Washington is 932 miles. Upon this whole line no tunnelling will be necessary and the grades will be moderate. From Memphis to New Orleans by the river is 802 miles.

Between Chattanooga and Charleston, S. C., a distance of 430 miles, there is now a railroad in full operation. A company has been organized with a state subscription to construct a railroad from Lynchburg to City Point on James river, a distance of 110 miles. City Point is 10 miles from Petersburg. A part of this road is being built.

From Richmond, via the Danville road, to Lynchburg, is about 137 miles. A company has been organized to build a railroad between these two points and 90 miles is now under contract. From Norfolk to Lynchburg via the Weldon road, is about 180 miles. An act has been passed incorporating a company, without any aid of the state, to construct a railroad between these two points, and it is expected the road will be built at no very distant day. From Lynchburg to Washington via Gordonsville is about 180 miles; via Richmond and Fredericksburg about 270 miles.

Massachusetts.

Essex Railroad.—The county commissioners met at the Court House in this city on Monday last, according to adjournment, upon the petition of the Eastern vs. the Essex railroad company, when the latter company having failed to appear, and not having given the security ordered by the commissioners, as required by statute, for the payment of all such damages and costs as shall be awarded by said commissioners, or by a jury, for land or other property taken, record of the proceedings thus far was made, and petition, as to all other matters and things, was continued for further advisement.

We understand that notice has been given by the Eastern to the Essex company no longer to pass over the premises belonging to the former at the Northey's Point crossing, under that part of the statute which provides that all the right or authority of the company declining to give such security to enter upon or use the land or other property of the other party, except for making surveys, shall be suspended until they shall give such security. There are other orders for security which are also unanswered as yet by the Essex railroad company, and matters would seem to have arrived at that crisis when the real friends of the company should make a vigorous effort to relieve it of its embarrassments, if the thing can reasonably be done.—*Salem Register.*

New York.

Attica and Hornellsville Railroad.—A meeting of the friends of this road was held in Buffalo recently. There were delegates from the several counties through which it is designed to pass. The Buffalo Courier says:

"We learn from these gentlemen that the bona fide subscriptions obtained on the line of the road are as follows:

Attica	\$100,000
Middlebury	25,000
Warsaw	34,000
Gainesville	25,000
Castile	45,000
Genesee Falls	21,000
Portage	15,000
Nunda	50,000

\$315,000

The actual subscription exceeds this amount.—In addition to this, from \$75,000 to \$100,000 is guaranteed to be subscribed on the line, without including the subscription at Hornellsville, which will be \$25,000.

The company have, in short, what is equivalent to a subscription of \$450,000.

Several contractors have offered to build large portions of the road and take from 25 to 50 per cent. in stock. One contractor offers to build 30 miles on these terms. Another offers to build 10 miles, and take 50 per cent. in stock."

Illinois.

Alton and Sangamon Railroad.—The Alton Telegraph says: "We are gratified to be able to state that active operations on the Alton and Sangamon railroad commenced on Monday. A large number of men are now employed; and so soon as the necessary additional implements can be procured—which will be in a few days—the full force will be put on. All the iron, spikes, ties, etc., required for the whole route, have been purchased; and the early completion of this great work may be confidently anticipated. Stockholders should now come forward promptly, and pay the instalments regularly as they fall due.

We understand that Mr. Joseph Gilmore, formerly of Dayton, Ohio, but for nearly one year past a resident of this city, has obtained the contract for the first four miles from the terminus on Seventh street to the Coal branch. This embraces all the heavy cutting, and is by far the heaviest job on the whole route. The long experience and acknowledged energy of Mr. G. are a sufficient guarantee that his part of the work will be well done, and completed in good time; and we hope he will obtain an ample remuneration for his labor and enterprise."

Ohio and Pennsylvania Railroad.

More than two thousand men and horses are now employed upon the Ohio and Pennsylvania railroad, and the work done in the month of August amounted to nearly \$50,000.

This is a large force for a line on which the work is generally light, and it shows the rapidity with which it is advancing towards completion.

Some additional subscriptions to the stock will be needed to enable the company to complete the road to Massillon without incurring a floating debt. About one hundred and twenty thousand dollars of new subscriptions will be required for this purpose—and, when we consider the importance of the work to Pittsburg, its value to the stockholders, and the short time in which it can be brought into profitable use, we see the strongest reasons why the amount required should be readily raised. The contractors are doing the work at cash prices, and the directors should be kept in funds to carry out

this wholesome system to the end.—*Pittsburgh Gazette.*

Western Railroad Credits.

The Michigan Central railroad has been the pioneer in establishing Western railroad credits at the East. The success of this road has opened the eyes of eastern capitalists, and they now acknowledge that they never dreamed of the resources of the great west, as has been illustrated by the business of the railroads now in operation.

Western railroad securities are now negotiated with as much ease as in the eastern. Within the past year, the Indiana roads have raised over a million of dollars by loans, and within the past month the Central has obtained an additional loan of \$1,000,000—the Milwaukee and Mississippi railroad \$250,000, and the Chicago and Galena road \$400,000. In addition to these loans, \$5,000,000 of railway stock has been taken for enterprises of the west.—*Detroit Tribune.*

Indiana.

Hamilton and Rushville Junction Railroad.—In our last paper we noticed that Caleb B. Smith, Esq., had been appointed the President of this road and that there was a prospect of a speedy commencement. A writer in the Cincinnati papers, urging the claims of this road, says:

"Your connection with St. Louis should be made by a road passing through the centre of Indiana.—This you can effect very soon and at a small expense. Your road to Hamilton will soon be completed, a road from that point via Oxford, Connersville and Rushville to Indianapolis, takes you to the centre of the state. In two weeks from this date [Aug. 17.] cars will run from Rushville to Indianapolis. The only link then wanting in the chain is from Rushville to Hamilton. To supply this link we have a charter to make the Junction railroad, and the right of way has been given to our country by the Ohio Legislature. The route has been recently surveyed by Mr. Moore, one of the best engineers in the west, and is found to be very favorable. A first class road with a T rail, 60 lbs. to the yard, can be made for about \$15,000 per mile, making the aggregate cost a fraction over \$800,000. Our people are ready to take hold of the work and put half of it under contract this fall if we can get a reasonable amount of assistance from your city. If this road shall be made, cars will run direct from Cincinnati to Indianapolis. Roads are now in progress from Terre Haute, Lafayette and Peru, three prominent points on the Wabash river, to Indianapolis, and all of them will be completed in two years. If the Junction railroad shall be made, the whole trade which will be brought to Indianapolis on these three roads will be carried direct to Cincinnati. Your city will thus drain the trade of the whole centre of the State and that of the Wabash valley. But in addition to this, the road from St. Louis, eastward, will be made to Terre Haute, crossing the Wabash at that point, and you will then have a direct railroad communication with St. Louis. All these advantages will be secured to your city by the construction of the Junction road, and surely no road has been projected by which it can secure such immense advantages at so small a cost."

Ohio.

Cincinnati, Hamilton and Dayton Railroad.—The Hamilton Intelligencer says that the work on this road is progressing rapidly. On Monday two boat loads of T iron arrived here, designed for the portion of the road between Cincinnati and this place. The company is at this time engaged in securing the right of way between this place and Dayton, and we learn that it is the intention of the contractors to commence operations in a few days on that part. The manner in which the work is pushed forward by the company is certainly very creditable.

Maryland.

Railroad Election.—At an election for President and directors of the Wrightsville, York and Gettysburg railroad company, held on Tuesday at the office of the company in York, the following gentlemen were elected:

President—Robert M. Magraw.

Directors—John Herr, J. F. Cockey, T. Stevens, W. F. Walters, W. Thompson, Henry Welsh, A. Herr Smith, David G. Barnitz.

Description of a Powerful Magnet.

Mr. Faraday produced (at a meeting of the Royal Institution) a magnet of remarkable power, to which he invited attention. This magnet was made by Mr. Elias, of Harlaem, and presented to Mr. Faraday by Mr. Logeman, of that city. It weighs 0-98 lb., and lifts 26 lbs., and its power is not diminished on the keeper being forced abruptly from the poles, even though this be done many times in succession. Mr. Faraday reminded the meeting of Haecker's formula, which fixes the greatest sustaining power of the best artificial steel magnets at 10-33 N 2-3 [N being the weight of the magnet]; and he stated that this magnet has twice the power expressed by that formula, and that even when a disk of letter paper is interposed between the poles and the keeper, it will sustain the weight indicated by this formula.

Mr. Faraday mentioned that the small horse shoe magnet belonging to the Royal Institution weighs 7 lbs. 14 oz., and lifts from 40 to 41 lbs. (i. e., nearly 10-33 N 2-3. He concluded by noticing that this magnet of Mr. Elias would support its own weight at a single pole; and in this property it resembles the cylindrical bar magnets now made in the electro-magnetic helix, and used in the magnetical observatories. He suggested that this horse shoe magnet of Mr. Elias might probably be charged by a similar process. These magnets are manufactured in Haarlem at a cheap rate, even when possessing great power.—*London Athenium.*

Ohio.

Cincinnati and St. Louis Railroad.—The Cincinnati Gazette of Wednesday last says:—"The City Council at their meeting on Monday night, adopted a preamble and resolutions for submitting to a vote of the electors, the question, whether the city shall lend to the Ohio and Mississippi railroad company \$800,000 in 6 per cent bonds, to be expended in the construction of the road from this city west. The loan to be made when \$200,000 or upwards of stock shall have been subscribed by good and solvent subscribers, nor until a board of directors, a majority of whom shall be citizens of Hamilton county, shall be elected.

"This important question is now to be submitted to the people of the city, and there can be little doubt, but that they will direct the loan to be made."

The Coal Trade.

We give below a brief glance at the rapid increase of production and present magnitude of the anthracite coal trade, which may serve to refresh the memory of the reader:

The trade commenced with 365 tons in the year 1820; that the production reached 48,047 tons in 1827; that it had increased to 881,026 tons in 1837, and advanced to three millions of tons in 1847; without including much that is consumed on the spot, in the mining districts, or in the interior of the country.

The increased production, therefore, was, in the first ten years, viz: from 1827 to 1837, 1735 per cent.; in the second ten years, viz: from 1837 to 1847, 240 per cent.; and in the twenty years previous to 1848, that is, from 1827 to 1847, 6150 per cent.

Another view of this subject exhibits this accel-

erated increase in the consumption of anthracite, perhaps, with yet greater perspicuity. The amt. which was periodically forwarded to market, exclusive of the consumption in and near the places of production, and which has not been estimated, is as follows:

Aggregate in the 21 years from 1820 to 1840, inclusive.....	6,847,172 tons.
In the succeeding 7 years to '47, inclusive.....	12,381,961 tons.
Total from commencement....	19,219,133 tons.

Georgia.

Muscogee Railroad.—The board of directors at a meeting last week, passed an order for the purchase of locomotives for this road. The contractors are making good progress in grading and getting timbers for the superstructure. It is expected that by the month of April, 30 miles of the road out of this city, will be ready for the cars. The sections beyond the Flint river are now in process of location, and a large force will be put on them in November. We can thus see the end of this enterprise, and count safely upon a steam carriage from Columbus to Macon, in a little over twelve months.—*Columbus Times.*

Virginia.

Orange and Alexandria Railroad.—We learn that the board of directors of this railroad company at their recent meeting, adopted the location of the road through Prince William and Fauquier counties, on what is called the *upper line*.

This line passes about two miles and three quarters to the right of Brentsville, and within seven-eighths of a mile of Milford.

We learn also that the location of the road is now completed from Alexandria to Gordonsville, and that the total distance is rather less than 89 miles.

The board have directed the energetic prosecution of the graduation from Bull Run to Culpeper Court House, which has been hitherto kept back until the question of routes was decided.

We wish we were able to make a similar announcement for the Western section, and take the liberty to urge upon the friends of the work there, the propriety of forwarding an enterprise so important to their interests. A strong effort now might effect its commencement this fall, and certainly secure its completion in the year 1852.

There was a meeting of the stockholders of this company, held in this place, yesterday, at the Lyceum Hall, B. E. Harrison in the chair, and J. H. Reid, secretary. The meeting was called for the special purpose of considering the application for the branch of the road to Warrenton. The decision of the stockholders, we understand, was *adverse* to the application.—*Alexandria Gazette.*

New York.

Ogdensburg Railroad.—This railroad is to be opened for business through its whole line on the first of October next. An active competition will then spring up between the railroads running towards Boston, and the canal boats running to New York for the carriage of such freight as the above road may bring to the shores of Lake Champlain. We are anxious to see how this will terminate.—Our belief now is that merchandise can be transported from Rouse's Point to New York by lake and canal navigation for about one-half of what it will cost to send it by railroad to Boston. The above road will do a large local business we have no doubt. The amount of its through business is more problematical. As far as its influence is con-

cerned it will be decidedly in favor of this city, as Rouse's Point is and must always be nearer New York *commercially* than Boston. We wish the road all success. It is a very important one for the inhabitants of the northern part of this State. It has great obstacles to contend with, and we are heartily glad to see it so near its completion.

North Carolina.

The North Carolina Central Railroad "is to commence on New river, near Waynesboro', in Wayne county, where the Wilmington railroad crosses it. Thence, via Raleigh, keeping near Greensboro', through Lexington to Charlotte, in Mecklenburg county, a distance of about 220 miles." The capital stock of the company is \$3,000,000; one third being subscribed by individuals, and the balance by the State. At Charlotte the road will connect with the Charlotte and South Carolina railroad, which is to connect with the South Carolina railroad at Columbia, and will soon be completed.—On the north it will probably be connected with the Richmond and Danville railroad, and form a part of a very direct line between the north and south. We understand that the above road will be ready for contract about the first of January next.

Casting by Centrifugal Motion.

We have frequently spoken of this new mode of casting, invented by Mr. Thos. J. Lovegrove, of Baltimore. The process is very simple, consisting merely of pouring the melted iron into a cylinder, which is made to revolve with great rapidity, and by this motion the iron is equally distributed over its whole inside surface. The form of the casting may be varied at pleasure, by changing the form of the cylinder.

The pipes cast in this way are much stronger than those cast by the old process. The specific gravity of the iron is much greater. Every revolution of the cylinder adds one grain or layer to the pipe, which effectually prevents all air holes, and gives an uniform thickness to every part of it.—From the simplicity of the operation, we should judge that casting by this mode would be cheaper than by the old process. We have no doubt of its superiority in all other respects.

We learn that an incorporated company has been formed in Baltimore under the title of the *Centrifugal Company*, for the purpose of bringing this invention into use, and that the stock to the same is now being subscribed. We are glad to see that Mr. Lovegrove is like to meet with the reward which his ingenuity so richly merits.

To Iron Manufacturers.

The attention of those engaged in the manufacture of iron in the north and east, and who find it difficult to sustain themselves against both foreign and domestic competition, under the disadvantages of their position, is invited to the advertisement of the Alabama and Tennessee railroad, for proposals to furnish that road with iron manufactured in the former State. The amount wanted is sufficient to give a rolling mill a good start, and in Alabama, if in any State in the Union, the manufacture of iron can be carried on successfully. Here coal and iron ore of the best quality lie side by side, and works in the interior of this State would enjoy a strong protection in the cost of transportation, in addition to the revenue duty. After the railroad shall be supplied, the ordinary wants of the country will require a very large amount of pig and bar iron. But the railroad which is now in progress will be the parent stem of many other branches; so that the demand for these works would in all pro-

bability increase instead of diminish. On the whole, we do not know of a finer unoccupied field. Alabama is admitted to be one of the finest States in the Union, and her public works, which are now in progress, are destined to make her one of the most active and flourishing. Will not some of the northern manufacturers examine into this matter?

AMERICAN RAILROAD JOURNAL.

Saturday, September 14, 1850.

Influence of Railroad Construction upon the Money Market.

One of the most marked characteristics of this age, is the rapid and constant investment of accumulated capital. The discovery and application of natural forces, such as steam and electricity to the arts of life, and the vast addition which they have made to our means of production and enjoyment, making available sources of wealth, which, without such aids, would have been entirely beyond our grasp, have given an importance to capital, (understood as accumulated products) such as was never felt in any former age. In former times, when there was but little variety to labor: when, from age to age, the same routine of industry was followed, when from the want of suitable means of transportation, the most useful of products possessed no commercial value, the little capital that was accumulated, was hoarded, either from inability to use it, or for the purpose of securing it from the exactions of government, or from the brigand or the outlaw. But progress has brought with it security, and has opened to us channels by which accumulated capital may instantly become the means of further production; and the man who possesses most of this, yields by virtue of it a paramount influence in society. Formerly the land holder was king or noble. Now the monied man, who may not own a foot of land, has taken the place of these, in controlling the conduct of his fellow men. The former have been dethroned, and the latter installed in their place.

But to the point. How far will the rapid progress of our works of internal improvement interfere injuriously with the ordinary business operations of the country, which, to be conducted with ease, requires that a large amount of accumulated property shall remain uninvested? If, as a community, we embarrass ourselves, we defeat the objects we have in view. We must pause till we have extricated ourselves before we can again start with success.

The value of a railroad as a reproductive agent, depends of course upon the character of the country, and the pursuits of the people, through which it runs. This is the reason why railroads in this country are so much more useful and successful than in England. At the present time our great interest and pursuit is agriculture. These are of a bulky character, compared with their value, and from the want of interior markets must be transported to the seaboard, either for consumption at home or abroad. For the want of domestic markets, the value of produce depends upon the cost of transportation. In many parts of the country these are greater than the cost of culture; consequently many portions of the country remain either unsettled, or produce only what is consumed on the spot.

Our capacity for production in this country is unlimited. The great drawback to it, as we stated before, is the cost of conveyance to the seaboard. Now any contrivance that diminishes this cost adds in the same proportion to the property of the coun-

try. All public works are an illustration of this. Perhaps no one more strikingly so than the Indiana canal. Before this was opened, the price of corn on the Wabash was from 15 to 20 cents per bushel. It is now worth from 35 to 40 cents. The amount received yearly from this increased price is the yearly addition to the property of the State, arising from the sale of corn alone. Take the New York canal. The people of the United States could better build it every year from the saving they make by it in transportation—than do without it. The above serve merely as illustrations of the influence of all works of a similar kind.

It England every farmer enjoys a market at his own door. With the farmer there, the railroad is not equivalent to a market. At best, it only gives him a choice of markets. Most of the manufacturing towns, too, are near the sea shore, so that her manufactured fabrics require to be transported but a short distance. Railroads there are useful, but by no means to the same extent as in the U. States. The great masses have but little interest in their construction or success. Because railroads have not been successful there is no reason why they should not be here. The condition of things is entirely different, consequently that country furnishes no guide for this.

The only part of this country where the injurious effects of a too rapid construction of these works has been seriously felt, are the New England States. Here too many competing lines have been built, and too many have been pushed into unproductive parts of the country which had but little surplus to send to a market. But the fault here is in the expense of the roads, rather than the income. This nearly always exceeds the estimate, but by no means in the same ratio as expenses. These are owing partly to the rugged nature of the country, partly to bad management, and partly from the fact that most of them terminate in Boston and other large towns, involving vast expenses for suitable accommodations, in the shape of real estate, etc. If they had cost only one half the present sum, which is more than double the average cost of railroads in other parts of the Union, they would have been highly productive, and the influence of their success upon the money market, and upon public sentiment, would have completely prevented the result which we now witness. If in other parts of the U. States, railroads can be built for one third the cost of the New England railroads, then the want of success of the latter is no argument against the former, where the country is better adapted to their construction, and furnishes a greater business for their support.

Now we believe it may be demonstrated, that every railroad built in the west—we mean by this not such as might be built, but those that will be constructed for some years to come—instead of exhausting, will add so immediately to the means of the country, that the drain created by them will not be felt: that every such railroad will soon become so much additional means in the hands of those who construct them, for further progress and improvement. There is hardly a road constructed or in progress in the western country, where this is not, and will not prove, true. From the amount transported, the sum saved soon equals their cost. When this point is reached, the cost of construction ceases to be felt as a burden. It must be borne in mind, too, that every railroad is but the precursor of innumerable ordinary and plank roads, which all act as feeders to the main trunk line; which, like the channel of a mighty river, bears on its

bosom the floods collected from a thousand tributaries.

We do not see any reason, therefore, to fear from the construction of railroads, in the west particularly. If they must be built with money from the east, this will soon be returned in the increased tide of western produce sent back in exchange. If we cannot export our breadstuffs to the extent to be desired, the receipt of gold from the new State of California will prevent any pressure in the money market, which might have proved disastrous but for this new resource.

On the whole, we see no danger in the encouragement of these works; neither do we believe that anything is to be feared from their construction, to the extent to which they will be carried for some years to come at least.

Missouri.

Pacific Railway.

The St. Louis papers give an interesting account of a recent tour of Mr. Allen, President of the road, through the State on behalf of this work. He was every where welcomed in the most enthusiastic manner, and received assurances of a large subscription along the line of the road. Nearly all the counties through which it will run will subscribe largely, and individual subscriptions will be fully up to the ability of the people.

We learn that the engineer has completed the survey of one route from Jefferson City to the western boundary line of the State, in Cass county.—He is now engaged in running another line, commencing at or near the mouth of the Kansas river.

The entire surveyed route from St. Louis to the western State line, proves to be about 265 miles in length. There will be three routes surveyed from St. Louis to Jefferson City; five or six in the neighborhood of Jefferson City, and not less than two on the remainder of the route westward.

The friends of this road are very much encouraged by the favorable aspect of affairs. The route is much shorter than was anticipated, is of easy construction, and the whole population interested in the road are prepared to subscribe to its stock to the full extent of their means. With a large city like St. Louis, vitally interested in this work, and abundantly able to build it herself without aid from other sources, we certainly expect to witness the most rapid progress of this road.

We have occasion to know that the engineer of the road, who has the reputation at the east of being a man of cool, dispassionate judgment, is very favorably impressed with the importance of this line, with the resources of the country it is to traverse, and with the ability of the people of Missouri to build it, much more so than when he left New York. His opinion in these matters, will have great weight in this market, should the company ever come here for money, which very probable it may do.

Connecticut.

The New London, Willimantic and Palmer railroad has been completed to its junction with the Western railroad at Palmer, Mass.

Maine.

The Kennebec and Portland railroad is now completed from North Yarmouth to Portland.

Augusta, Hallowell and Gardiner have voted in favor of loaning their corporate credits to this road. These will place the company in funds, and there is now no doubt of the speedy completion of this work to Augusta.

The Steam Engine.

The present census of the United States when completed will show a very marked increase of the Northern States over the Southern. This disparity will be as great in the old as the new States. In Massachusetts the increase will be twice as great as in Virginia, or compared with the area of the two, nearly twenty times as great. The increase of Rhode Island with an area of 1200 square miles will probably be as great as North Carolina with 50,000.

The increase in the olden Northern States has not been in the agricultural towns. These have only gained where their growth has been stimulated by the manufacturing or commercial towns in their vicinity. The increase of population of the farming towns finds it for its advantage to emigrate west, where land is cheap, rather than pay the price asked at home. The gain is found as we said above in the manufacturing and commercial towns. The latter have grown from the additional business brought to them by the new facilities for transportation which have been opened, which enables the farmer to increase the amount of his products by diminishing the expense of sending them to market. The manufacturing towns owe the greater part of the rapid growth to the application of the steam engine to the manufacturing purposes. The south has not yet availed herself of this agency to any considerable extent. Hence the difference.

In the direction and application of her industry the south as far as great pursuits are concerned has derived but little advantage from the use of steam. Her whole work is still carried on by muscular power. Now the wealth of a people can be measured very exactly by the extent to which natural forces supersede muscular action. There is a limit to the efforts of the latter, but there is no limit to the extent of steam power. The steam power of England represents the labor of 300,000,000 men. Compared with a people who make no use of this power, she is as much stronger as if this power was actually represented by this number of living beings. Compare England or the United States with Spain. The power of these countries bear no ratio to their number of people, but to the extent to which natural power or agents are made use of by each. England is fifty times more powerful than Spain, because her steam power represents fifty times more men than Spain possesses.

So long as one country can monopolise the use of natural agents her gains are measured by the amount saved by their use, because she puts this difference into her own pocket. This is true to a less extent so long as by the negligence, indolence, or want of skill of other communities, she enjoys this monopoly. The immense wealth of England is owing to this fact. For a long time she monopolised, for manufacturing purposes, the steam engine. She could thus manufacture at one-quarter the former cost and sell at the old rates. All the world becomes tributary to the people who can manufacture cheapest.

Dr. C. T. Jackson.

Our readers will find in another column an advertisement of this distinguished Geologist, offering his services to the public in the line of his profession. Dr. Jackson enjoys a well established and widely known reputation as a skilful and experienced Geologist, and those having mines to explore or assaying to be done, cannot commit them to more experienced hands.

European and North American Railway.

Mr. A. C. Morton, Chief Engineer of the Atlantic and St. Lawrence railroad, is soon to commence the survey of that portion of the line through the State of Maine. The people in the Provinces appear to be fully aroused to the importance of this great work to them, and are coming forward most liberally with their subscriptions. We see no reason to doubt but that they will build their part of the line. They certainly will, if there is money and credit enough in the Provinces to do it.

New York.

Troy and Greenfield Railroad.—The directors of the Troy and Greenfield railroad company have been authorised, by the stockholders, to receive proposals for the construction of their railroad from North Adams to the State-line of New York; and if the report is favorable, it is stated that that portion of the road will probably be put under contract.

Spathic Iron and Steel Ores at Roxbury and New Milford, Ct.

The existence of this ore has long been known, but it has attracted but little attention for many years past, owing probably to the supposed difficulty of working the mines. Attention has recently been attracted to it, and it is found to be very accessible and easily worked. The excellent quality of the iron made from this ore gives it a very high value, and causes it to be sought for by those engaged in the manufacture of the best kinds of cutlery, and in machinery where great strength elasticity are required. We believe that this variety of ore is not worked in any part of the United States, nor in any part of the world, except in Germany, where it forms the basis of the celebrated "German steel." We understand that arrangements are making to work this ore on a large scale, for the purpose of converting it into steel; and it is believed that as good an article can be made from it as the best imported.

This locality was formerly worked for silver, which is associated with the ore. From a record of ancient workings, it appears that a large amount of silver was obtained. The mine was abandoned in consequence of the difficulty, under the old system of mining, of keeping it free from water. The old shaft has recently been cleared out, and proves to be 125 feet deep. The vein is about 10 feet wide, with a lode of pure ore about 4½ feet, which increases as it descends. The base of the hill, in which the mine is located, is 470 feet below the top of the shaft. The outcrop at the base is about 2 feet wide and about half a mile from the shaft.—We learn that one furnace is already in blast, and that others are in progress.

Columbia Silver and Lead Mining Co.

The above is a title of a company which has recently commenced operations at a locality in the towns North East and Aneram in Columbia county in this State. We were shown a few days since several tons of this ore, at the smelting establishment of M. Solomon & Co. in this city, which was very rich in metal, and we understand that analysis has proved it to contain about 75 per cent to the ton of ore. We learn that there is every appearance of an abundance of ore, and the specimens analysed prove it to be rich in silver. A large quantity is now raised to the surface, and works are to be immediately erected to reduce it to the metal.

The locality was worked during the war of the

Revolution, but abandoned soon after. The lead obtained from it went to supply the army. The whole range of the Green Mountains is known to be rich in minerals, and we think that there is reason to believe that the above mine will turn out to be a valuable one. We wish the company abundant success.

To Contractors.

The attention of contractors is invited to the advertisement of lettings by the Alabama and Tennessee railroad, in another column. This road, which will be vigorously pushed, is worthy of attention, not only for the present, but prospective work to be let. A portion of our northern contractors could not do better than to locate themselves in the south and west, as the great number of railroads which will soon be in progress will give them plenty of work.

Tredegar Iron Works.

ROLLING MILL, FOUNDRY AND MACHINE SHOPS. The undersigned continues to manufacture at his Works in this city (from best charcoal metal) Bar Iron of every description, embracing—Rounds and Squares, from ½ to 5 inches diameter. Plates, from ½ to 7 inches, all thicknesses. Bands and Scrolls, all sizes. Boiler plate and Plough Iron. Railroad and Locomotive Axles and Tires. Locomotive Frames, Spikes and Plates. Hoops, Ovals, Half Ovals, Half Rounds, Angle, T, L, and indeed every description of Iron usually manufactured, all of which he warrants to be equal to any made in this country. He also manufactures at his Foundry and Machine Shops all descriptions of Railroad Work, say, Locomotives, Railroad Wheels and Axles complete and ready for the road, Railroad Chairs, etc. Also, Marine and Stationary Engines all sizes, Sugar mills and Engines, Horse mills, and every kind of Machinery usually required for the operations of the country. He has paid particular attention to getting up machinery, etc., for Gold Mine operations, and those in want of such work might find it to their advantage to give him a call.
J. R. ANDERSON.

Richmond, Va., Sept. 10, 1850.

To Contractors.

ALABAMA AND TENNESSEE RIVER R. R. SEALED Proposals will be received by the Directors of the Alabama and Tennessee River Railroad, at their office in Selma, until the 1st of November next, for the graduation, masonry and bridging of 56 miles of the Southern Division of said road, extending northwardly from Selma.

Plans and profiles may be inspected and specifications and information will be given at the office of the company in Selma, on and after the 15th of October next.

Twenty-six miles of this division were graded in 1839. This part of the division will require repairs to the road bed, and will be furnished anew with culverts and bridges.

The country embraced in this division is healthy, well watered, and possesses facilities for obtaining supplies of provisions.

Proposals may be based upon cash payments, or upon payments of a proportion, or of the whole of the work in stock.

The Directors reserve to themselves the right to accept or reject proposals as they may think proper for the interests of the company.

The Directors expect to have as much as twenty miles of the Northern Division, extending northwardly from the Coosa river in Shelby county, ready for examination by the 15th November, and for letting by the 1st December; and 30 miles more, ready for examination by the 1st and for letting by the 15th of January, 1851. It is likewise their intention to let out the grading, masonry and bridging of the remainder of the Southern Division and of the Northern Division terminating at Gadsden, with all possible despatch.

By order of the President and Directors.

LEWIS TROOST, Chief Engineer.
Selma, Ala., August 30 1850.

CUT NAILS OF BEST QUALITY, BAR IRON (including Flat Rails) manufactured and for sale by
FISHER, MORGAN & CO.,
75 N. Water St., Philadelphia.

Great American Engineering

AND MECHANICAL WORK, just published in medium folio One Dollar, 75 cts. to Subscribers. Part VII of "Specimens of the Stone, Iron & Wood Bridges, Viaducts, Tunnels, Culverts, &c., &c., of the United States Railroads." By George Duggan, Architect and Civil Engineer.

The present part contains beautifully executed plans, elevations, sections and details of the elegant timber Bridge, (Burr's Patent,) 150 feet span, across Salmon River, Malone, on the line of the Northern-Ogdensburg-railroad, and isometrical views of Bridges 30, 40 60, 82 and 88 feet span on the line of the Utica and Syracuse railroad, with specifications, form of contract, &c., &c., for the Connecticut River railroad.

"It is a work that was a great desideratum, and must prove of great benefit to the engineering profession generally, and especially to the tyro in practical engineering and mechanical knowledge; in truth it strikes us, that it would require years of labor and patient toil on the part of a young engineer to prepare the drawings, and collect the information that will be embodied in this work, and can now be secured for the trifling sum of \$9"—[Scientific Amer. March 16, 1850.]

In connection with this subject (Iron Railroad Structures) we take occasion to call attention again to Mr. Duggan's valuable and expensive publication, exhibiting drawings, with full descriptions of the various stone, iron and wooden bridges, viaducts, tunnels, culverts, etc., of all the Railroads in the United States. Mr. Duggan is an accomplished Architect and Civil Engineer, who came from Ireland to this country to exercise his profession; but finding railroad construction here, in many respects, different from that he had been accustomed to in Europe, he applied himself to the study of our system; and the fruits of his researches and investigations embodied in this work, are well calculated to meet the exigencies of engineers, and to assist draughtsmen, bridge builders, mechanics and students.—[N. Y. Jour. of Com., Feb. 14, 1850.]

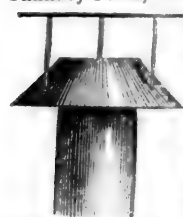
Published by

GEORGE DUGGAN,
300 Broadway, New York.

To whom all communications should be addressed, and subscriptions forwarded.

Emerson's Patent Ventilator,

ADAPTED to Cars, Engine houses, Public Halls, Factories, Churches, School Houses, Dwellings, Chimney Flues, etc.



3,000 of the article.

CHILSON, ALLEN, WALKER & Co.,
351 Broadway, New York.

This Ventilator is stationary, and cannot get out of order. It is constructed in such conformity to certain ascertained laws of pneumatics, as to insure a constant draft outward, whatever may be the changing direction of the wind. The Massachusetts Mechanic Association have awarded a gold medal to the Inventor, and the Manufacturers have already disposed of over 3,000 of the article. Manufactured and sold by

NOTICE

For Proposals for Railroad Iron, for the Alabama and Tennessee River Railroad,

TO BE MANUFACTURED FROM ALABAMA ORE.

THE Alabama and Tennessee River Railroad Co. invite proposals, until the 1st of January, 1851, for Iron Rails, to be made of Alabama Iron, for the Northern Division and part of the Southern Division of their road, embracing a distance of about 105 miles. The rails are to be of the H pattern, in lengths of 18 feet, and weighing 63 lbs. per lineal yard. They are to be delivered on the Coosa river, at a landing to be hereafter designated, between Kimulgee ferry and Fort Williams, commencing their delivery on the 1st of November, 1851, and continuing it at the rate of from 80 to 100 tons per week, until the whole quantity required (10,500 tons) shall have been delivered. They are to be inspected by Lewis Troost, Chief Engineer.

It is proper to state to iron masters and capitalists at a distance, that the country traversed by the Northern and part of the Southern divisions of the road abounds in excellent iron ore and bituminous coal, and possesses every advantage for the successful manufacture of iron, health, cheap labor and provisions.

Further information may be obtained by addressing the President of the Company at Selma, Ala. By order of the Board of Directors.

J. W. LAPSLEY, President.

Great Work on Bridge Building, etc., etc.

JUST published in medium folio, One Dollar, 75 cts. to subscribers.

Part I. of a "THEORETICAL AND PRACTICAL TREATISE ON THE CONSTRUCTION OF BRIDGES IN STONE, IRON AND WOOD," By George Duggan, Architect and Civil Engineer.

The present part contains beautifully executed plans, elevations, sections, and centering, of the Bridge of St. Maizence, France, by M. Perronet, the eminent Architect and Engineer, and plans, elevations, sections, and details of the oblique Timber Bridge, 700 ft. long, constructed for a double track across the River Tyne, on the line of the Newcastle and Carlisle railroad, by John Blackmore, C. E., with an introductory article on the relative merits of the various materials employed in the construction of Bridges, as regards economy, strength and durability, and critical remarks on the various forms of bridges designed and constructed by the most eminent architects and engineers in Europe and America.

"PART VI. of Specimens of the Stone, Iron and Wood Bridges, etc., etc., of the United States Railroads," By George Duggan, Architect and Civil Engineer, contains specimens of the plates and letter press intended for the APPENDIX, being the commencement of a complete Treatise on the Theory and Practice of Bridge Building. This will be one of the most valuable works on the subject ever presented to the attention of engineers in this country—condensing the most important information on this branch of architecture contained in the writings of the most eminent scientific men in the French, German, Italian, and English languages, in the course of the last and present century. It will be illustrated by numerous accurate representations of bridges of the greatest celebrity in modern times. Elaborate articles will be given on the strength, property, and uses of the different materials employed, and on the most approved methods of constructing Cofferdams, Foundations, Centering, etc., with descriptions and drawings of the various engines and Machines that were found most useful in constructing the works, and a selection of such specifications as may be of service to the practical bridge builder. The sixth number treats of the Application of Iron to Railroad Structures, and is illustrated by beautiful drawings of the Bridge across the Delaware at Saw Mill Rift on the Erie Railroad, and of the bridge over Fairfield street, on the Manchester and Birmingham Railroad. The great success of this work thus far is the best tribute to its scientific merit and its adaptation to the wants of the American engineer.—[New York Daily Tribune, June 23, 1850.]

Published by George Duggan, 300 Broadway, New York, to whom all communications should be addressed and subscriptions forwarded. Parties remitting Mr. Duggan \$5. and the remainder \$4 when they have been supplied with the first six parts of the "Theoretical and Practical Treatise on Bridge Building, etc." shall receive it monthly as published. To those making Mr. Duggan a present remittance of \$9, the work will be forwarded post free to any part of the United States.

Rosendale Cement.

THE NEWARK AND ROSENDALE LIME AND CEMENT CO. are now manufacturing at their works in NEWARK, N. J., and Ulster county, N. Y., a very superior article of *Hydraulic Cement*—also Lime Calcine Plaster, etc. Contractors and dealers will find it to their advantage to call or make application before purchasing elsewhere. All communications addressed to the subscriber, at Newark, N. J., will be punctually attended to.

14*15 HENRY WILDE, Secretary.

Notice to Contractors.

SEALED PROPOSALS will be received at the office of the James River and Kanawha Company in Richmond, until the 1st day of October next, for the construction of the Piers and Abutments of the Bridges across James River at New Canton, Hardwicksville and Bent Creek. This work will be paid for in cash. Besides the usual reservation of 20 per cent. on the monthly estimates, the contractor or contractors will be required to give ample security, satisfactory to the Board of Directors, for the completion of the work at the time and in the manner specified in the contracts.

Plans of the above works will be exhibited and specifications thereof delivered to the contractors at the office of John Cauty, the Assistant Engineer in charge of the same in Columbia.

WALTER GWYNN,
Chief Eng. J. R. & K. Co.

August 16, 1850.

GRAHAM'S COMPOSITION, to Remove and Prevent Incrustation (or Scale) in STEAM BOILERS.

THIS valuable composition having been fully and extensively tested, is now offered to the public, as a sure remedy and preventive for incrustations in steam boilers of all descriptions. By its use, all scale is entirely removed from the boilers of Ocean and River Steamers, Locomotive and Stationary Engines, in from 3 to 20 running days, according to the size of the boiler and thickness of the scale. In New Boilers, all incrustation is prevented at a trifling expense.

The preservation of the boiler, great economy of fuel and labor, safety, and increased speed, are among the advantages to be derived from the use of this composition.

Orders should state the quality of water used, viz: "Salt," "Fresh," or "Brackish."

For sale, with directions for use, by

W. H. NEWMAN,
75 Pearl street,
New York.

TESTIMONIALS.

New York, August 17, 1850.

We have used Graham's Composition in the boilers of the Steamship Southerner, during several voyages between this place and Charleston. The boilers were old and very foul with scale, a very large quantity of which was removed by the use of the composition, and no new scale was formed.

From our own experience and observation in the use of the article, we are fully satisfied that it will effectually remove the incrustation made by sea water, and also that it will effectually prevent its formation.

We are also satisfied that the use of it will be attended with a great saving of fuel, and that it has no injurious effect upon iron.

DAVID N. MAXON, Engineer,
BERRY, Master,
Steamship Southerner.

Steamship Philadelphia, }
New York, August 27, 1850. }

I have used "Graham's Composition for Steam Boilers," in the boilers of Steamship Philadelphia, on the voyage to and from Chagres, and am entirely satisfied that it will remove, dissolve and prevent all scale or incrustation in salt water boilers.

For the preservation of the boiler and economy of fuel and labor, I hereby recommend the employment of this composition in the Boilers of Ocean Steamers.

WM. BISBY,
Chief Engineer.

Novelty Iron Works, }
New York, July 5, 1850. }

We have examined the specimen of Graham's Composition for preventing incrustation of steam boilers, and we believe it may be used with perfect safety in reasonable quantities for the purpose intended, as there does not appear to be any agent in the composition calculated to injure the iron.

STILLMAN, ALLEN & CO.

Piermont, May 20, 1850.

I have used "Graham's Composition," and find it to produce the intended effect; and I hereby, without hesitation, recommend it for Stationary, Marine and Locomotive Engine Boilers.

JOHN BRANDT,
Superintendent Motive Power
New York & Erie R.R.

New York, July 25, 1850.

In answer to many inquiries as to the practical effect of "Graham's Composition," I will state that I have used it in the boiler of the Steamboat Sunwick, which had become considerably incrustated with hard scale from both salt and fresh water. We used 10 lbs. per day, for three days, without blowing off the water, until the fifth day, when all was drawn off. To our astonishment, we found the whole interior of the boiler as clear of scale and smooth as when it came from the hands of the maker. The following week, we tried the same quantity in a small steam tow boat.—The boiler had old scale of long accumulation and very thick. We ran the boat three days without blowing off, and on the fourth day washed out the boiler and found it, like the "Sunwick's," perfectly clean and smooth as when new. I am therefore enabled to state that the use of the composition in these two instances under my own immediate observation and direction, has been attended with complete success.

JAMES MORROW,
Engineer Astoria Ferry.

Faggotted Car and Engine Axles

FORGED by RANSTEAD, DEARBORN & Co., Boston, Mass.
These Axles enjoy the highest reputation for excellence, and are all warranted.

Ogden & Martin's ROSENDALE CEMENT.

WE are prepared to enter into arrangements for supplying our Cement for public works or other purposes. We warrant the cement equal in every respect to any manufactured in this country. It attains a great degree of hardness, sets immediately under water, and is a superior article for masonry coming in contact with water, or requiring great strength.

For sale in tight barrels, well papered, at their office by
OGDEN & MARTIN, 104 Wall st.
February 16, 1850.

The above cement is used in most of the fortifications building by government.

Railroad and Mathematical Instruments.

KUNS & BASELER, Mathematical Instrument makers, manufacture and keep for sale all kinds of mathematical instruments; also drawing instruments, scales and balances for the use of chemists, professional gentlemen, jewellers, etc., etc., of the most perfect description, at the lowest price, at 81 Nassau street, New York.

Ibbotson, Brothers & Co's CELEBRATED CAST STEEL

AND
Best Cast Steel Royal Improved Files, well known as better adapted for Engineers' and Machinists' purposes than any now in use in the United States.

Every description of Square, Octagon, Flat and Round Cast Steel, Sheet, Shovel and Railway Spring Steel, etc., and Steel to order for any purpose—manufactured at their works in Sheffield—and universally known by the old stamp "Globe."

HENRY I. IBBOTSON, Agent,
218 Pearl st., New York.

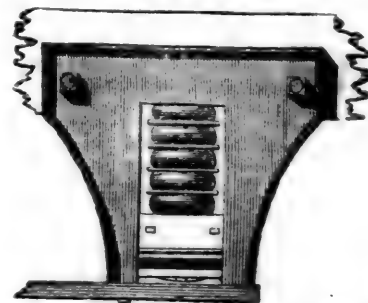
Railroad Iron.

OF ANY PATTERN AND WEIGHT,
Of a Favorite Brand,
And deliverable in Bond, or Duty paid, at any Port of the U. S., contracted for on favorable terms, by
CHARLES ILLIUS,
20 Beaver St., New York.

Pig and other Iron also contracted for. Sole Agent for "Baxter's Machine and Burning Oil"—particularly adapted for "Railroads" and other Machinery—Preferred to Sperm by the many now using it, and 25 per cent. cheaper.

Coal.

CUMBERLAND SEMI-BITUMINOUS COAL
superior quality for Locomotives, for sale by
H. B. TEBBETTS,
No. 40 Wall St., New York.
May 12, 1849. 1ml19

FULLER'S PATENT INDIA RUBBER SPRING.

THESE SPRINGS ARE THE CHEAPEST,
the lightest and most durable of any yet known. They are easily applied to new or old cars, and there is small possibility of any accident occurring to them.

Other parties through Mr. Ray set up claims to an India Rubber Spring which, though the same in principle, is very inferior in its working and durability. Actions are in progress for an Infringement on Fuller's Patent against parties using that Spring.

The superiority of Fuller's Spring over that claimed by Mr. Ray is fully established and has frequently been testified to. The following are from gentlemen who have had much experience with both Springs.

"It will afford me pleasure to recommend your springs to the companies in this region, in preference to Ray's which I am confident are inferior in mechanical arrangement to yours."
JOHN M'RAE,
Engineer S. Carolina R. R., Charleston.

"I do not hesitate to allow you to say that I concur in Mr. M'Raë's opinion that Ray's springs are inferior in mechanical arrangement to Fuller's. I repeatedly expressed that opinion long before Mr. M'Raë had seen your springs (as I believe) and entertain it still."
WM. PARKER,
Gen'l Supt. of Baltimore and Ohio R. R.

Office of Supt. Norwich & Worcester R.R. Co. }
December 26, 1849. }

"I most fully concur in the opinion of Jno. McRae, Engineer of S. Carolina Railroad, that 'Rays Springs are inferior to Fuller's Springs;' and shall with pleasure recommend them to all Railroad Companies for adoption. I have used both springs on this road and have no hesitation in saying that I should in all cases prefer Fuller's Spring."

SAM'L H. P. LEE, JR.,
Supt. and Engineer.

Office B. & P. R. R. Co. }
Boston, 20th December, 1849. }

"This company have cars fitted up with both Ray's and Fuller's 'Metallic India Rubber Springs,' and do not hesitate to say that Fuller's arrangement is very much superior to Ray's."

W. RAYMOND LEE, Supt.

The following result has been obtained by experiment upon one railroad.

A set of Trucks fitted
with Steel Springs cost \$190.77 and weigh 2355 lbs.
The same with Fuller's
Springs, . . . 131.71 " 1911 lbs.

Difference, . . . \$59.06 " 444 lbs.

Not only is there an advantage in the cost, but owing to the great reduction in weight, the car can be made lighter throughout, and so an enormous saving in weight may be effected in a Train.

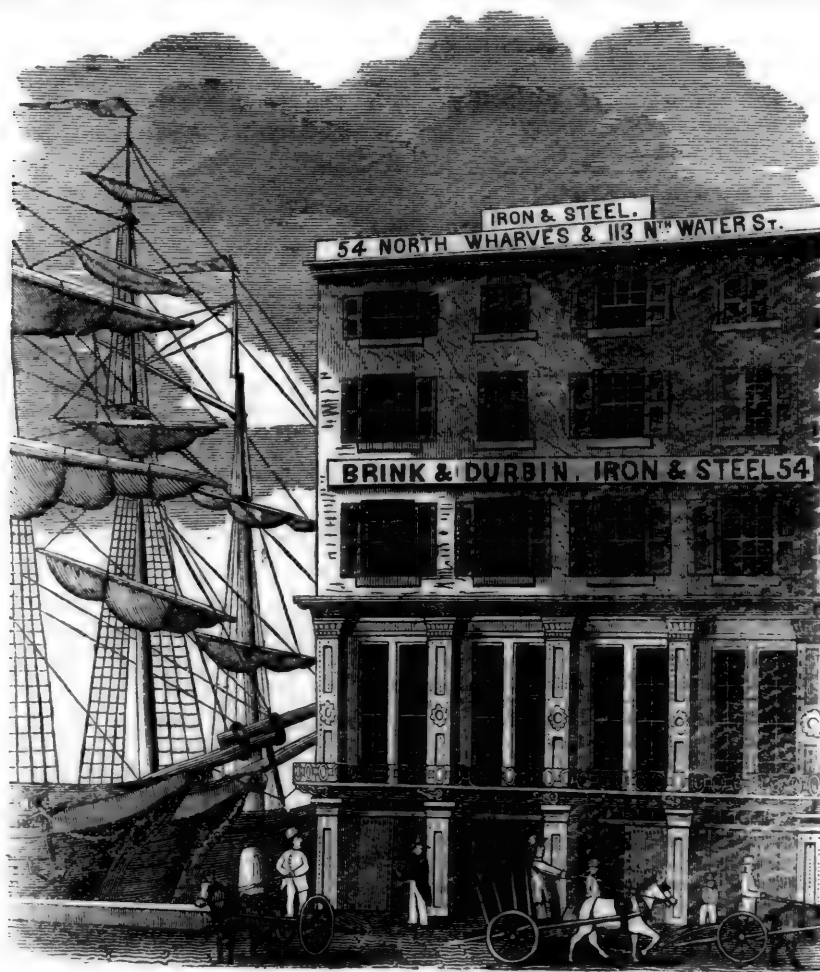
AGENTS.

G. M. KNEVITT, 35 Broadway, N. Y.,
JOHN THORNLEY, 110 Chestnut St., Philad.
The BOSTON BELTING CO., Milk st., Boston.
January 2, 1850.

American Cast Steel.

THE ADIRONDAC STEEL MANUFACTURING CO. is now producing from American iron, at their works at Jersey City, N.J., Cast Steel of extraordinary quality, and is prepared to supply orders for the same at prices below that of the imported article of like quality. Consumers will find it to their interest to give this a trial. Orders for all sizes of hammered cast steel, directed as above, will meet with prompt attention.

May 28, 1849.

**To Merchants, Railroad Companies, Machinists and Boiler Makers.**

THE subscribers beg leave to call attention to their very large stock of Iron and Steel—of American, English, Swede and Norway make—of all the different kinds in use. Also, Railroad Iron, Ship, Boat and Railroad Spikes. They are also Agents for the Best Pennsylvania Locomotive Boiler and Tank Iron, each sheet of which will be stamped and warranted, at lowest mill prices. Our prices for all kinds of iron will be found very low, either for cash or approved credit.

BRINK & DURBIN, Philadelphia.

ENGINEERS.**Atkinson, T. C.,**

Alexandria and Orange Railroad, Alexandria, Va.

Banks, C. W.,

Civil Engineer, Vicksburg, Miss.

Buckland, George,

Troy and Greenbush Railroad.

Clement, Wm. H.,

Little Miami Railroad, Cincinnati, Ohio.

Cozzens, W. H.,

Engineer and Surveyor, St. Louis, Mo.

Alfred W. Craven,

Chief Engineer Croton Aqueduct, New York.

Davidson, M. O.,

Eckhart Mines, Alleghany Co., Maryland.

Fisk, Charles B.,

Cumberland and Ohio Canal, Washington, D. C.

Felton, S. M.,

Fitchburgh Railroad, Boston, Mass.

Floyd-Jones, Charles,

South Oyster Bay, L. I.

Gzowski, Mr.,

St. Lawrence & Atlantic Railroad, Montreal, Canada.

Gilbert, Wm. B.,

Rutland and Burlington Railroad, Rutland, Vt.

Grant, James H.,

Nashville and Chattanooga R. R., Nashville, Tenn.

S. W. Hill,

Mining Engineer and Surveyor, Eagle River, Lake Superior.

Hewson, M. Butt,

Memphis, Tenn.

Holcomb, F. P.

Southwestern Railroad, Macon, Ga.

Johnson, Edwin F.

New York and Boston Railroad, Middletown Ct.

Latrobe, B. H.,

Baltimore and Ohio Railroad, Baltimore, Md.

Miller, J. F.,

Worcester and Nashua Railroad, Worcester, Mass.

Morris, Elwood,

Schuylkill Navigation, Schuylkill Haven, Pa.

Morton, A. C.,

Atlantic and St. Lawrence Railroad, Portland, Me.

McRae, John,

South Carolina Railroad, Charleston, S. C.

Nott, Samuel,

Lawrence and Manchester Railroad, Boston.

Prichard, M. B.,

East Tennessee and Georgia R. R., Cleveland, Tenn.

Roebling, John A.,

Trenton, N. J.

W. Milnor Roberts,

Bellefontaine and Indiana Railroad, Marion, Ohio.

Roberts, Solomon W.,

Ohio and Pennsylvania Railroad, Pittsburgh, Pa.

Sanford, C. O.,

South Side Railroad, Virginia.

Schlatter, Charles L.,

Northern Railroad (Ogdensburg), Malone, N. Y.

Sours, Peter,

Rahway, New Jersey.

Stark, George.,

Bost., Con. and Mont. R. R., Meredith Bridge, N. H.

Steele, J. Dutton,

Pottstown, Pa.

Trautwine, John C.,

Panama Railroad—Address through office of Panama Railroad Co., 75 Broadway, N. Y.

Trimble, Isaac R.,

Philad., Wil. & Baltimore Railroad, Wilmington, Del.

Tinkham, A. W.,

United States Fort, Bucksport, Me.

Thomson, J. Edgar.,

Pennsylvania (Central) Railroad, Philadelphia.

Troost, Lewis,

Alabama and Tennessee Railroad, Selma, Ala.

Whipple, S.,

Civil Engineer and Bridge Builder, Utica, N. Y.

Williams, E. P.,

Auburn and Schenectady Railroad, Auburn, N. Y.

Williams, Charles H.,

Milwaukee, Wisconsin.

HOTELS.**Exchange Hotel,**

Adjoining Eastern Railroad Depot,

BUFFALO, N. Y.

BY.....**FISS & SPERRY,**
Late of Delevan House, Albany.**J. D. Abraham, Architect,**

NO. 300 MAIN STREET,

BUFFALO, N. Y.

Fountain Hotel,

LIGHT STREET, BALTIMORE,

P. THURSTON.....Proprietor.

DUNLAP'S HOTEL,

On the European Plan,

NO. 135 FULTON STREET,

Between Broadway and Nassau St.,
NEW YORK.**MANSION,**Corner of Maine and Exchange Streets,
P. DORSHIMER. BUFFALO.**GUY'S****United States Hotel,**

(Opposite Pratt street Railroad Depot),

BALTIMORE.

JOHN GUY. WILLIAM GUY.

American Hotel,

Pratt street, opposite the Railroad Depot,

BALTIMORE.

HENRY M. SMITH.....Proprietor.

Late of the Exchange & St. Charles Hotels, Pittsburgh.

Washington Hotel,

BY JOHN GILMAN,

\$1 Per Day.

No. 206 Pratt street, (near the Depot),

BALTIMORE.

Barnum's City Hotel,

MONUMENT SQUARE, BALTIMORE.

This Extensive Establishment, erected expressly for a Hotel, with every regard to comfort and convenience, is situated in the centre and most fashionable part of the city, and but a few minutes' walk from the Railroad Depots and Steamboat Landings.

The House has lately undergone a thorough repair, embracing many valuable improvements, and will accommodate 250 Guests. BARNUM & CO.

JONES' HOTEL,

NO. 152 CHESTNUT STREET,

PHILADELPHIA.

BRIDGES & WISER, Proprietors.

BUSINESS CARDS.**Lithography.**

JOHN P. HALL & CO.,

161 Main st., Buffalo, (Commercial Advertiser Build.)

Are prepared to execute all kinds of Lithography in good style and at reasonable rates. Particular attention will be paid to Engraving Railroad Maps, Engineer's Plans and drafts, etc., and orders in this line are respectfully solicited.

J. T. Hodge

Will attend to the examination of mining tracts near Lake Superior, and prepare Reports and Maps.

Address, during the Summer,

Ontonagon Postoffice, Lake Superior.

Cumberland Steam Coal,

FROM THE

FROSTBURG MINES, MD.

H. A. TUCKER,

Agent of Frostburg Coal Co.

No. 50 Wall Street, New York.

Eaton, Gilbert & Co.,

Railroad Car, Coach and Omnibus Builders,

TROY, N. Y.

Charles T. Jackson, M. D.,

STATE ASSAYER, late Geologist to Maine, Rhode Island, New Hampshire, and the United States, offers his services to his friends and the public in making any Chemical, Mineralogical or Geological researches that may be required for the improvement of Agriculture and the Manufacturing Arts. Particular attention will be paid to the exploration of mines and to assaying of ores of the metals.

State Assayer's office, 31 Somerset st.

Boston Sept. 3, 1850

To Railroad Companies and Mechanical Establishments.

A Person of considerable experience and practical knowledge in Mechanical, Civil and Marine Engineering, is anxious to meet with an engagement with either a Private Individual or Public Company, who may have works either to design or execute in the above branches of the Engineering Profession.

Address Z. Y., 47 Atlantic st., South Brooklyn, L. I.

STEEL AND FILES.**R. S. Stenton,**

20 CLIFF STREET, NEW YORK,

AGENT FOR

J. & Riley Carr's

BAILEY-LANE WORKS, SHEFFIELD,

Manufacturers of Cast, Shear, German and Blister

STEEL

Of all descriptions. Warranted Good

FILES.

Manufacturers of Machinists' Warranted Best Cast Steel Files, expressly for working upon Iron and Steel, made very heavy for recutting.

A full Stock of Steel and Files at all times on hand. 6m4

Walter R. Johnson,

CIVIL AND MINING ENGINEER AND ATTORNEY for Patents. Office and Laboratory, F St., opposite the Patent office, Washington, D. C.

Dudley B. Fuller & Co.,

IRON COMMISSION MERCHANTS,

No. 139 GREENWICH STREET,

NEW YORK.

Manning & Lee,

GENERAL COMMISSION MERCHANTS,

NO. 51 EXCHANGE PLACE,

BALTIMORE.

Agents for Avalon Railroad Iron and Nail Works, Maryland Mining Company's Cumberland Coal 'CED'—'Potomac' and other good brands of Pig Iron.

Cop Waste.

CLEAN COP WASTE, suitable for cleaning Railroad, Steamboat and Stationary Engines, constantly on hand and for sale by

KENNEDY & GELSTON,

54 Pine St., New York.

October 27, 1849,

3m

Plushes for Railway Cars, Omnibuses, etc.**F. S. & S. A. MARTINE,**

112 WILLIAM ST., NEAR JOHN.

ARE now receiving a large and complete assortment of Plain and Figured PLUSHES, of their own importation, which will be sold at the lowest market price, viz: Crimson, Maroon, Scarlet, Green, Blue, Purple, etc.

ALSO—CURLED HAIR, the best manufactured in market.

Samuel Kimber & Co., COMMISSION MERCHANTS

WILLOW ST. WHARVES, PHILADELPHIA.

AGENTS for the sale of Charcoal and Anthracite Pig Iron, Hammered Railroad Car and Locomotive Axles, Force Pumps of the most approved construction for Railroad Water Stations and Hydraulic Rams, etc., etc.

July, 27, 1849.

James Herron, Civil Engineer,OF THE UNITED STATES NAVY YARD,
PENSACOLA, FLORIDA.,

PATENTEE OF THE

HERRON RAILWAY TRACK.

Models of this Track, on the most improved plans, may be seen at the Engineer's office of the New York and Erie Railroad.

To Railroad Companies.**—WROUGHT IRON WHEELS—**
SAFETY AND ECONOMY.**NORRIS' LOCOMOTIVE WORKS,**
SCHENECTADY, NEW YORK,

Are Manufacturing Wrought Iron Driving, Truck, Tender, and Car Wheels—made from the best American Iron. Address E. S. NORRIS.
May 16, 1849.

Manufacture of Patent Wire ROPE AND CABLES,

For Inclined Planes, Suspension Bridges, Standing Rigger, Mines, Cranes, Derrick, Tillers, &c., by JOHN A. ROEBLING, Civil Engineer,
TRENTON, N. J.

Doremus & Harris,ANALYTICAL & CONSULTING CHEMISTS,
179 BROADWAY, NEW YORK.

SCHOOL OF CHEMISTRY.

To Engineers and Surveyors.

E. BROWN AND SON Mathematical inst. makers No. 27 Fulton Slip, New York, make and keep for sale, Theodolites, Levelling inst., Levelling rods, Surveyors Compasses, and Chains, Cases of Mathematical drawing insts. various qualities, together with a general assortment of Ivory Scales and small insts. generally used by Engineers.

Ranstead, Dearborn & Co.,MANUFACTURERS OF
LOCOMOTIVE CRANKS AND CAR AXLES,

ALSO

WROUGHT IRON SHAFTING,
And All Kinds of Hammered Shapes.

Forge at Commercial Point, Dorchester,
Office 25 Foster's Wharf, opposite No. 211 Broad St.
BOSTON.

Henry I. Ibbotson,

IMPORTER of Sheffield and Birmingham Goods.
Also, Agent for the Manufacture of Telegraph Wire.
218 PEARL ST., NEW YORK.

Cumberland, (Md.) Coals for Steaming, etc.

ORDERS RECEIVED FOR AND FILLED
by J. COWLES, 27 Wall St., N. Y.

Samuel D. Willmott,MERCHANT, AND MANUFACTURER OF
CAST STEEL WARRANTED SAWS,

—AND FILES—

IMPORTER OF THE
GENUINE WICKESLY GRINDSTONES
NO. 8 LIBERTY STREET,
NEW YORK.

Railroad Instruments.

THEODOLITES, TRANSIT COMPASSES, and Levels, with Fraunhoffer's Munich Glasses, Surveyor's Compasses, Chains, Drawing Instruments, Barometers, etc., all of the best quality and workmanship, for sale at unusually low prices, by
E. & G. W. BLUNT,

No. 179 Water St., cor. Burling Slip.
New York, May 19, 1849.

IRON.**Railroad Iron.**

3,000 TONS C. L. MAKE 63½ lbs. per yard,
now landing and to arrive.

Also contracts made for future delivery of above superior make English Iron.

300 Tons Banks Best Iron, Round, Square and Flat.

200 " English Bar

10 " 9-16 Square Iron for Railroad Spikes.

For sale in lots to suit purchasers by
DAVID W. WETMORE.

New York, March 26, 1850. 3m

Railroad Iron.

THE UNDERSIGNED, Agents for Manufacturers, are prepared to contract to deliver Rails of superior quality, and of any size or pattern, to any ports of discharge in the United States.

COLLINS, VOSE & CO.,
74 South St.

New York, June 1, 1850.

Railroad Iron.

1,500 Tons weighing 53 lbs. per lineal yard.

500 " " 57 " "

500 " " 56 " "

500 " " 60 & 61 lbs. "

Also 2½ flat rails. All the above being of approved patterns. For sale by

DAVIS, BROOKS, & CO.,
68 Broad street.

N.B.—Rails imported on commission, or at a fixed price.

Iron.

Pig Iron, Anthracite and Charcoal; Boiler and Flue Iron, Spring and Blistered Steel, Nail Rods, Best Refined Bar Iron, Railroad Iron, Car Axles, Nails, Stove Castings, Cast Iron Pipes of all sizes, Railway Chairs of approved patterns for sale by

COLEMAN, KELTON & CAMELL,
109 N. Water St., Philadelphia.

IRONDALE PIG METAL, MANUFACTURED

and for sale by the Bloomsburg Railroad Iron Co.
LINDLEY FISHER, Treasurer.
75 N. Water St., Philadelphia.

Railroad Iron.

2000 Tons, weighing 58 pounds per lineal yard, of the most approved pattern of T rails, in store and to arrive, for sale by

COLLINS, VOSE & CO.,
74 South St.

New York, June 1, 1850.

Railroad Iron.

1650 Tons, weighing about 61 lbs. per yard, 40 tons, weighing about 52 lbs. per yard, and 825 tons, weighing about 53½ lbs. per yard, of the latest and most approved patterns of T rail, for sale by
BOORMAN, JOHNSTON & CO.,
119 Greenwich street.

New York, Aug. 26, 1850.

N.B.—B., J. & Co are also prepared to take contracts for English rails, delivered in any of the Atlantic ports of the United States.

Railroad Iron.

THE UNDERSIGNED, HAVING made arrangements abroad, are prepared to contract for the delivery of Foreign rails, of approved brands upon the most favorable terms.

They will also make contracts for American rails, made at their Trenton works, from Andover Iron, in whole or in part, as may be agreed upon.

They are prepared to furnish Telegraph, Spring and Market Wire; Braziers and Wire Rods; Rivets and Merchant Bars to order, all made exclusively from Andover Iron. The attention of parties who require iron of the very best quality for special purposes, is respectfully invited.

COOPER & HEWITT,
17 Burling Slip, New York.

February 15, 1850.

Glendon Refined Iron.

Round Iron, Band Iron, Hoop Iron,
Square " Flat " Scroll "

Axles, Locomotive Tyres,

Manufactured at the Glendon Mills, East Boston, for sale by
GEORGE GARDNER & CO.,
5 Liberty Square, Boston, Mass.

Sept. 15, 1849. 3m37

PATENT HAMMERED RAILROAD, SHIP & BOAT SPIKES.—The Albany Iron Works have always on hand, of their own manufacture, a large assortment of Railroad, Ship and Boat Spikes from 2 to 12 inches in length; and of any form of head. From the excellence of the material always used in their manufacture, and their very general use for railroads and other purposes in this country, the manufacturers have no hesitation in warranting them fully equal to the best spikes in market, both as to quality and appearance. All orders addressed to the subscribers at the works will be promptly executed.

JOHN F. WINSLOW, Agent.

Albany Iron and Nail Works, Troy, N. Y.
The above Spikes may be had at fact prices, of Erastus Corning & Co Albany, Merrill & Co., New York; E. Pratt & Br. 1st, Baltimore Md

LAP—WELDED WROUGHT IRON TUBES

FOR

TUBULAR BOILERS,

FROM ONE AND A QUARTER TO SEVEN INCHES IN DIAMETER.

THE ONLY Tubes of the same quality and manufacture as those so extensively used in England, Scotland, France and Germany, for Locomotive, Marine and other Steam Engine Boilers.

THOMAS PROSSER & SON, Patentees,
23 Platt street, New York.

Railroad Iron.

THE UNDERSIGNED ARE PREPARED TO contract for the delivery of English Railroad Iron of favorite brands, during the Spring. They also receive orders for the importation of Pig, Bar, Sheet, etc. Iron.

THOMAS B. SANDS & CO.,

73 New street,
New York.

February 3, 1849.

Iron Store.

THE Subscribers, having the selling agency of the following named Rolling Mills, viz: Norristown, Rough and Ready, Kensington, Triadelphia, Pottsgrove and Thorndale, can supply Railroad Companies, Merchants and others, at the wholesale mill prices for bars of all sizes, sheets cut to order as large as 58 in. diameter; Railroad Iron, domestic and foreign; Locomotive tire welded to given size; Chairs and Spikes; Iron for shafting, locomotive and general machinery purposes; Cast, Shear, Blister and Spring Steel; Boiler rivets; Copper; Pig Iron, etc., etc.

MORRIS, JONES & CO.,

Schuylkill 7th and Market Sts., Philadelphia.
August 16, 1849. ly33

Railroad Iron.

THE MOUNT SAVAGE IRON WORKS, Alleghany county, Maryland, having recently passed into the hands of new proprietors, are now prepared, with increased facilities, to execute orders for any of the various patterns of Railroad Iron. Communications addressed to either of the subscribers will have prompt attention.

J. F. WINSLOW, President

Troy, N. Y.

ERASTUS CORNING, Albany

WARREN DELANO, Jr., N. Y.

JOHN M. FORBES, Boston.

ENOCH PRATT, Baltimore, Md.

November 6, 1848.

Railroad Iron.

THE SUBSCRIBERS ARE PREPARED TO take orders for Railroad Iron to be made at their Phoenix Iron Works, situated on the Schuylkill River, near this city, and at their Safe Harbor Iron Works, situated in Lancaster County, on the Susquehanna river; which two establishments are now turning out upwards of 1800 tons of finished rails per month.

Companies desirous of contracting will be promptly supplied with rails of any required pattern, and of the very best quality.

REEVES, BUCK & CO.

45 North Water St. Philadelphia,
March 15, 1849.

Monument Foundry.

A. & W. DENMEAD & SON,
Corner of North and Monument Sts.,—Baltimore,

HAVING THEIR

IRON FOUNDRY AND MACHINE SHOP

In complete operation, are prepared to execute faithfully and promptly, orders for Locomotive or Stationary Steam Engines, Woolen, Cotton, Flour, Rice, Sugar Grist, or Saw Mills,

Slide, Hand or Chuck Lathes, Machinery for cutting all kinds of Gearing. Hydraulic, Tobacco and other Presses, Car and Locomotive patent Ring Wheels, warranted,

Bridge and Mill Castings of every description, Gas and Water Pipes of all sizes, warranted, Railroad Wheels with best faggoted axle, furnished and fitted up for use, complete

Being provided with Heavy Lathes for Boring and Turning Screws, Cylinders, etc., we can furnish them of any pitch, length or pattern.

Old Machinery Renewed or Repaired—and Estimates for Work in any part of the United States furnished at short notice.

June 8, 1849.

Iron Wire.

REFINED IRON WIRE OF ALL KINDS,
Card, Reed, Cotton-flyer, Annealed, Broom, Buckle, and Spring Wire. Also all kinds of Round, Flat or Oval Wire, best adapted to various machine purposes, annealed and tempered, straightened and cut any length, manufactured and sold by

ICHABOD WASHBURN.

Worcester, Mass., May 25, 1849.

Wheel, Forge and Foundry Iron.

LOCUST GROVE Wheel Iron of great strength and superior chilling property.
Balt. Charcoal Forge Iron, from Patuxent, Curtis Creek and Gunpowder furnaces.

Elkridge Foundry Iron, of superior strength and softness. Anthracite and Charcoal Iron from Pennsylvania and Virginia. Gas and Water Pipes, Lamp Posts from Elkridge furnace.

LEMMON & GLENN,

6m9 62 Buchanan's Wharf, Baltimore.

S. S. Keyser & Co., IRON WAREHOUSE,

Corner of South and Pratt Streets,
BALTIMORE, MD.

Selling Agents for the Rough and Ready Bar Iron and Elk Boiler and Flue Iron Rolling Mills, Sarah and Taylor Furnaces, and Wrightsville Hollow Ware Foundry, and Dealers in Bar and Sheet Iron, and Cast, Sheer, German, Blister, Spring and Electroplated Steel, etc., etc.

Smith & Tyson,

GENERAL COMMISSION MERCHANTS,
No. 25 South Charles St., Baltimore, Md.

AGENTS for the Celebrated Columbia Pig Iron, suitable for Car Wheels and Chilled Rolls. Columbia refined Charcoal Blooms; Refined Charcoal Juniata Billet Iron for Wire; Refined Iron for Bridging, of great strength; Cut Nails, Spikes, and Brads; Railroad Spikes and Wrought Chairs. 22tf

Stickney & Beatty,

DEALERS IN IRON AND IRON MANUFACTURERS.

AGENTS for the Balt. City Rolling Mill, from which establishment they are prepared to furnish Ellicott's round, square, and flat bar iron, puddled and charcoal boiler plates and billet iron—also agents for the sale of the Laurel and Maryland (Balt.) charcoal forge pig irons, Balt. hard iron for chilling wheels, anti-rust nails, Catocin foundry iron, boiler blooms from the Caledonian works, Wm. Jessop & Son's cast steel, Coleman's blister steel and nail rods, hoop, band, sheet, oval and common English iron.

Nos. 18 and 20 South Charles st., Baltimore.

Railroad Iron.

CONTRACTS made by the subscribers, agents for the manufacturers, for the delivery of Railway Iron, at any port in the United States, at fixed prices, and of quality tried and approved for many years, on the oldest railways in this country.

RAYMOND & FULLERTON, 45 Cliff st.

Iron.

THE SUBSCRIBERS having resumed the agency of the New-Jersey Iron Company, are prepared to execute orders for the different kinds and sizes of iron usually made at the works of the company, and offer for sale on advantageous terms.—

150 tons No. 1 Boonton Foundry Pig Iron.

100 " No. 2 do. do. do.

300 " Nos. 2 & 3 Forge do. do.

100 " No. 2 Glendon do. do.

140 " Nos. 2 & 3 Lehigh Crane do. do.

100 " No. 1 Pompton Charcoal do.

100 " New-Jersey Blooms

50 " New-Jersey Faggoting Iron, for shafts

Best Bars, $\frac{1}{2}$ to 4 inch by $\frac{1}{2}$ to 1 inch thick.

Do do Rounds and Squares, $\frac{1}{2}$ to 3 inch.

Rounds and Squares, 3-16 to 1 inch.

Half Rounds, $\frac{1}{2}$ to 1 in. Ovals & Half Ovals $\frac{1}{2}$ to 1 $\frac{1}{2}$ in.

Bands, $\frac{1}{2}$ to 4 inch. Hoops, $\frac{1}{2}$ to 2 inch.

Trunk Hoops, $\frac{1}{2}$ to 1 $\frac{1}{2}$ in. Horse Shoe & Nut Iron.

Nail Plates. Railroad Spikes.

DUDLEY B. FULLER & Co., 139 Greenwich-

st. and 85 Broad-st.

WILLIAM JESSOP & SONS' CELEBRATED CAST-STEEL.

The subscribers have on hand, and are constantly receiving from their manufactory,

PARK WORKS, SHEFFIELD,

Double Refined Cast Steel—square, flat and octagon.

Best warranted Cast Steel—square, flat and octagon.

Best double and single Shear Steel—warranted.

Machinery Steel—round.

Best and 2d gy. Sheet Steel—for saws and other purposes.

German Steel—flat and square, "W. I. & S." "Eagle"

and "Goat" stamps.

Genuine "Sykes," L. Blister Steel.

Best English Blister Steel, etc., etc., etc.

All of which are offered for sale on the most favorable terms by

WM. JESSOP & SONS,

91 John street, New York.

Also by their Agents—

Curtis & Hand, 47 Commerce street, Philadelphia.

Alex'r Fullerton & Co., 119 Milk street, Boston.

Stickney & Beatty, South Charles street, Baltimore.

May 6, 1848.

JOHNSON, CAMMELL & Co's Celebrated Cast Steel,

AND ENGINEERING AND MACHINE FILES,
which for quality and adaptation to mechanical uses, have been proved superior to any in the United States. Every description of square, octagon, flat and round cast steel, sheet, shovel and railway spring steel, best double and single shear steel, German steel, flat and square, goat stamps, etc. Saw and file steel, and steel to order for any purposes, manufactured at their Cyclops Steel Works Sheffield.

JOHNSON, CAMMELL & CO.,

100 William St., New York.

November 23 1849.

Railroad Iron.

THE Undersigned, Agents for Manufacturers, are prepared to contract for the delivery of English, Welsh and Scotch Rails, of any pattern and weight, also for every description of English, Welsh, Scotch, and Swedish Iron, Railway Chairs and Spikes, Rivets, Bolts, Nuts, Washers, Chain Cables, Anchors, Tin Plates, German Spelter, Iron Castings, and every description of Machinery.

WILLIAM BIRD & CO.,

Iron and Tin Plate Merchants,

44 Wall st., New York.

And at 5 Martin's Lane, City, London,

and 140 Buchanan st., Glasgow.

July 27th, 1850.

To the Proprietors of Rolling Mills and Iron Works.

THE Undersigned—Proprietors of Townsend's Furnace and Machine Shop, Albany—are extensively engaged in the manufacture of Machinery and fixtures for Iron, and Copper Rolling Mills, and Iron Works. Having paid particular attention to the manufacture of *Rolls* (Rollers), both *chilled* and *dry-sand*, they feel confident that they can execute orders for such castings in a satisfactory manner. And to give assurance of this, they beg leave to refer to the following named persons, proprietors and managers of some of the most extensive rolling mills in the country, viz: Jno. F. Winslow, J. Tuckerman, H. Burden, W. Burtt, J. & J. Rogers, Saitus & Co., J. B. Bailey, L. G. B. Cannon, Hawkins & Atwater, etc., etc.

F. & T. TOWNSEND.

Albany, August 18, 1849.

Railroad Iron.

B. O. Railway Tires, Railway Wheels,
Scotch Pig Iron, Tin Plates and Banca Tin,
Muntz's Patent Metal Sheathing,
Baltimore Copper.

Contracts for Rails made on behalf of the manufacturers, for delivery at any ports in the United States, at fixed prices.

Bowling Tires and Tire Bars and Scotch Pigs imported to order.

Muntz's Ship-sheathing, and a general stock of Tin Plates and Banca Tin in store, and for sale by

RAYMOND & FULLERTON, 45 Cliff st.

Bowling Iron. Stamped B.O.

Railway Tire Bars Rivet Iron
Locomotive and other Axles Locomotive Frame do
Boiler Plates Bars,
and every other description of this superior iron.

The subscribers, agents for the sale of Bowling Iron, are prepared to execute orders for importation, especially for railway and machinery uses, with despatch from the manufacturers.

RAYMOND & FULLERTON, 45 Cliff st.

Lovegrove's Patent Cast Iron Water and Gas Pipes.

THE Subscriber, the Inventor and Patentee of the Centrifugal mode of giving form to metallic substances while in a molten state, is preparing to make Cast Iron Water and Gas Pipes, of any dimensions, at prices much lower than they can be made in the old manner, and the pipes warranted to stand a pressure of three hundred pounds to the square inch, and to be soft enough to drill. Steam Engines and all kinds of machinery. Cast Iron Doors and Frames, and Mill Castings of every description, made to order.

THOMAS LOVEGROVE,

Machinist and Founder,

West Falls Avenue, below Pratt st., Baltimore.

Ray's Patent India Rubber Car Springs.

Savannah, Ga., May 22, 1850.

FOWLER M. RAY, Esq.,

Dear Sir: I have no hesitation in saying, after having used on our road your springs and Fuller's, that I consider yours decidedly the best in every particular, and in this opinion I am sustained by all our officers. Fuller's spring has a tendency to split, and also to chafe or abrade by the constant friction on the cast iron plates or discs: and in my opinion is not near so elastic as yours.

Your springs, which have been in use on our road for 12 or 15 months past, and in constant use under both passenger and freight cars, are to all appearances as elastic, sound and good, as when first put in use.

We are now building eighty-five new cars, of which for fifty-sets the springs have been ordered of you.

GEORGE A. ADAMS,

Master Carpenter,

Central Railroad and Banking Co. of Georgia.

Connecticut River Railroad Office, }

Northampton, May 4, 1850. }

E. CRANE, Esq.,

Dear Sir: It is now about two years since I first tried the experiment of using a set of Ray's India-rubber Springs upon one of our merchandise cars, and although the car has been in constant service since that time, I do not on examination find the slightest difference either in the thickness or elasticity of the material.

The same result has followed wherever we have applied them, either for wheel or draw springs on Engines, Tenders or Cars. At present we use no other; either in replacing old springs or building new cars—and I am perfectly satisfied that for economy, durability, safety, and ease of motion, that Ray's India-rubber is the best article for Springs which has been presented to the public.

Yours respectfully, **J. HUNT,**

Supt. Connecticut River Railroad.

EDWARD CRANE, Esq.,

Dear Sir: Having applied to cars of the Boston and Worcester Railroad Corporation, Ray's Vulcanised Rubber Springs (where they have been in use for some two years last past), I have had occasion to observe their operation, and am free to say in answer to your inquiries, that they retain their elasticity perfectly during all changes of atmospheric temperature: and are in my opinion a most valuable acquisition to Railroad Cars—are not liable to derangement, as is the case with steel springs; while at the same time it costs less to apply them. Respectfully yours,

D. N. PICKERING,

Supt. Motive Power, Bost. & Wor. Railroad,
Boston, April 15th, 1850.

FARMERS! ATTENTION!!**John Mayher & Co's**NEW AGRICULTURAL WAREHOUSE
AND SEED STORE,

197 WATER STREET, NEW YORK.

Where they have for Sale, the largest and most complete assortment of Farming Implements, ever offered for sale in this city—all of which they will sell 10 per cent. Cheaper than the same kind of Goods can be bought at any other house in the city. Our Goods are all Warranted to give satisfaction.

FARMERS wanting to purchase, will please call and examine our Stock before buying elsewhere.

Among our assortment may be found the Celebrated Highest Premium Eagle Ploughs! together with all the most approved Ploughs now in use.

Also,—Horse Powers, Threshing Machines, Fan Mills, Corn Shellers, Straw Cutters, Corn Mills, Seed Sowers, Churns, Ox Yokes, Ox Scrapers, Hay Rakes, Horse Rakes, Patent Chain Pump (that never freezes nor rusts), and other Pumps; in fact we have everything for Farming Purposes—together with Guano, Bone Dust and other Fertilizers.

JOHN MAYHER & CO.,
197 Water st., N. Y.

February 9, 1850.

N.B.—J. M. & Co. also continue their Old Stand, at 195 Front street, near Fulton Market.

**RAILROAD CAR
AND COACH TRIMMINGS.**
Doremus & Nixon,
IMPORTERS AND FURNISHERS

HAVE FOR SALE

Plain Garnet Plush. Fig. Garnet Plush (Butterfly pat.
"Crimson " "Crimson " (Elegant.
"Scarlet " " " " (Gen. Taylor.

BROCATELLES.

Crimson Silk Brocatelles. Gold and Maroon do.
Gold and Blue " " Brown "
Silk and Wool " of every color.

MOQUETTES,

Of elegant designs and colors.

GERMAN CLOTH FOR CAR LININGS.

The most beautiful goods ever shown in this country, and the subscribers are the sole agents for the sale of them.

Oil cloths Enamelled with Gold. These goods can be
" " Silver. furnished in any
Do. Silver ground velvet printed. dimensions req'd.

CURLED HAIR

Of every description and quality.

JNO. W. A. STRICKLAND, Agent.
New York, 1850. 1yl6
**FOWLER M. RAY'S
Patent India-rubber Railroad
CAR SPRING.**
New York and Erie Railroad Shops,
Piermont, March 26, 1850.

This will certify that from practical experience in the use of Fowler M. Ray's India rubber Car Springs, I believe them to be far superior to any others now in use.

I have never known them to be affected by any change of temperature, as other Rubber Springs have been affected on this road.

I am at the present time repairing a Passenger Car that Mr. Ray and myself mounted with his springs about two years and eight months since.

The springs are at the present time as perfect, to all appearances, as when first applied to the car.

Respectfully yours,

HORACE B. GARDNER,
Foreman of the Car Shops.Supt. Office N.Y. & H. R.R., }
New York, March 8, 1850.

This is to certify that we have used the Rubber Springs manufactured by Mr. F. M. Ray for the past twenty months, "both for Passenger and Freight Car Springs and Bumpers, and of different sizes," and have in every case given entire satisfaction, and I consider them the best spring now in use.

M. SLOAT, Supt.

Boston, March 5, 1850.

In answer to your enquiry about India-rubber Springs, I have to say that we have used them to a considerable extent on both freight and passenger cars, and also on several of our tenders; and I am very well satisfied that they answer all the purposes for which they are intended. I believe the India-rubber will soon supersede all other springs for cars and tenders.

Yours truly,

S. M. FELTON,
Supt. Fitchburg Railroad.Office New Jersey Railroad Co., }
Jersey City, March 8, 1850. }

FOWLER M. RAY, Esq.,

Dear Sir: In answer to your enquiries respecting the operation of the Vulcanised Rubber Springs, purchased by our company from you some two years since, I reply that they are superior to any spring in use, (that I have either seen or heard of).

The improved form of your spring, consisting of a solid piece of vulcanised rubber with bands on the outside, is far superior to your first form, consisting of disks of rubber with metallic plates interposed.

The last named form was tried, if you recollect, at a much earlier period; and then was replaced by your last form.

I have no hesitation in saying that your springs have given entire satisfaction, and most cheerfully recommend them to railroad companies throughout the country for the following reasons:

- 1st. The cost is 30 per cent. less.
- 2d. Saving of weight on each car of 8 wheels from 700 to 900 lbs.
- 3d. Less care and attention is required, as they are not liable to get out of repair.
- 4th. A great saving is secured in the wear and tear of the cars and rails from their great elasticity.
- 5th. The freedom from noise.
- 6th. There is greater safety in case of accident, as they cannot be broken.
- 7th. The comfort of passengers is enhanced sufficiently to pay the expense, waiving all the other reasons that I have given.

Should this fail to satisfy any person enquiring, you are at liberty to refer to me, No. 150 Washington St., Jersey City. Yours respectfully,

T. L. SMITH, Supt.

New York, March 11, 1850.

I have used the Patent India-rubber Spring purchased of Mr. Ray, upon the cars of the New York and New Haven Railroad, and have found them efficient and economical; and when applied to the axles and draw springs, believe them to be quite equal to any in use. I have found a combination of these springs with a steel spring under the transom beam a very satisfactory arrangement, and am now using this plan in all new cars.

Yours respectfully,

ROBERT SCHUYLER.

February 25, 1850.

From practical observation of the use of the India-rubber Car Springs, manufactured and sold by your company, we are entirely satisfied in their application, and do not hesitate to recommend them as elastic, durable, requiring no repairs for years, and retaining their consistency during all extremes of weather. We have applied them for the past two years, and consider them superior for all railroad purposes.

Yours truly,

OSGOOD BRADLEY, Car Builder, Worcester.
T. & C. WASON, do. Springfield.
DEAN, PACKARD & MILLS, do. do.
DAVENPORT & BRIDGES, do. Cambridgeport.Office of the New Jersey Railroad Co., }
Jersey City, March 7, 1850. }

This is to certify that we have had Mr. F. M. Ray's India-rubber Springs in constant use under our cars, and as Bumper Springs for upwards of two years, and they have in every way given perfect satisfaction.

The present form of spring we deem far superior to the form of Disk, having used both forms, although we have none of those made in Disks at present in use.

We take pleasure in recommending these springs to all railroad companies.

J. P. JACKSON, Vice Prest.
New Jersey Railroad and Trans. Co.

Roxbury, February 28, 1850.

In compliance with your request, I take great pleasure in stating the result of my experience in the use of "Ray's Patented Vulcanised India-rubber Car and Engine Springs." We have used them nearly two years, and never had one fail in any way. The cold weather does not affect them, as it has other rubber springs we have used.

With sixteen years' experience as superintendent of machinery on the Boston and Providence railroad, I take pleasure in saying that your springs are the best we ever used, or I ever saw used elsewhere. We have 20 cars rigged with them, of which I can say that the springs are as good now as when first applied. I put 24 lbs. of the rubber under the forward end of one of our heaviest engines, taking off 250 lbs. of steel springs—it has been in use 18 months, and is in as good condition now as when first put under the engine.

Very respectfully yours,

GEO. S. GRIGGS,
Supt. of Machinery, Boston and Prov. R.R.

Fall River, February 2, 1850.

In answer to yours of the 20th ult. I would say that this company has for some 10 or 12 months past been using "Ray's India-rubber Springs." We have applied them to both passenger and freight cars with uniform success. They have invariably preserved their elasticity and consistency through all the extremes of weather; and we are now applying them whenever the steel spring fails. I am well satisfied that they are particularly adapted for railroad purposes.

Very respectfully yours,

GEO. HAVEN,

Supt. Fall River Railroad.

Jersey City, March 9, 1850.

This is to certify that the present form of Mr. F. M. Ray's India-rubber Car Spring I consider far superior to the form of Disk, having used both forms.

I take pleasure in recommending these springs to all railroad companies. DAVID H. BAKER,
Foreman of Car Shop of N.J. R.R. & Trans. Co.

Harlem R.R. Depot, }

New York, March 7, 1850.

This is to certify that we have used Mr. F. M. Ray's India-rubber Springs for over eighteen months, and find them to be easy and durable, and recommend them to railroad companies as being superior to anything we have tried.

J. M. SMART,

Foreman at 42d St. Depot.

Old Colony Railroad Office,
Boston, March 6, 1850.

EDWARD CRANE, Esq.,

President New England Car Co.,

Dear Sir: In compliance with your request I would state that the Old Colony Railroad Comp'y have had in use upon their road, India-rubber Springs furnished by your company, for more than eighteen months past, during which time they have been extensively used under Passenger and Freight Cars, Locomotive Tenders, and for Drawer and Buffering Springs, with the most perfect success. The elasticity and consistency of the Rubber has never been unfavorably affected by either extremes of heat or cold—and from the experience which we have had in the use of Rubber Springs, I think them well adapted for railroad purposes—and therefore we have for some months past used Rubber almost exclusively, in all places where springs are required.

Respectfully yours, etc.,

JAS. H. MOORE,

Supt. O. C. Road.

Troy, February 27, 1850.

We have been using your India-rubber Car Springs for nearly two years—and we take pleasure in saying that in our opinion the rubber has to a certain extent already, and may eventually entirely supersede all other Springs for Railroad Car purposes. We now use it entirely for Draw Springs and Bumpers, considering it better and lighter than steel.

During our two years' experience in the use of it, we have not known any to lose their elasticity, or fail in any way; and we cheerfully recommend the rubber for railroad car springs. Very respectfully,

EATON, GILBERT & CO.

Passenger Car Linings.

THE Advertiser continues to make to order the Enamelled Car Linings which have been so highly approved the last three years, and are now exclusively used by all the Northern Railroads. No pains are spared to get out new styles, and adapt them to the tastes of every consumer.

Orders addressed to CHARLES STODDER, No. 75 Kilby street, Boston, will have prompt attention. March 23, 1850. 2m

India-rubber for Railroad Cos.

RUBBER SPRINGS—Bearing and Buffer—**Fowler's Patent**—Hose from 1 to 12 inches diameter. Suction Hose. Steam Packing—from 1-16 to 2 in. thick. Rubber and Gutta Percha Bands. These articles are all warranted to give satisfaction, made under Tyer & Helm's patent, issued January, 1849.—No lead used in the composition. Will stand much higher heat than that called "Goodyear's," and is in all respects better than any in use. Proprietors of railroads do not be overcharged by pretenders.

HORACE H. DAY,

Warehouse 23 Courtlandt street.

New York, May 21, 1849.

Spikes, Spikes, Spikes.

ANY person wishing a simple and effective Spik Machine, or a number of them, may be supplied by addressing

J. W. FLACK,

March 6, 1850.

Troy, N. Y.

MACHINERY.

Henry Burden's Patent Revolving Shingling Machine.



THE Subscriber having recently purchased the right of this machine for the United States, now offers to make transfers of the right to run said machine, or sell to those who may be desirous to purchase the right for one or more of the States.

This machine is now in successful operation in ten or twelve iron works in and about the vicinity of Pittsburgh, also at Phoenixville and Reading, Pa., Covington Iron Works, Md., Troy Rolling Mills, and Troy Iron and Nail Factory, Troy, N. Y., where it has given universal satisfaction.

Its advantages over the ordinary Forge Hammer are numerous: considerable saving in first cost; saving in power; the entire saving of shingler's, or hammerman's wages, as no attendance whatever is necessary, it being entirely self-acting; saving in time from the quantity of work done, as one machine is capable of working the iron from sixty puddling furnaces; saving of waste, as nothing but the scoria is thrown off, and that most effectually; saving of staffs, as none are used or required. The time required to furnish a bloom being only about six seconds, the scoria has no time to set, consequently is got rid of much easier than when allowed to congeal as under the hammer. The iron being discharged from the machine so hot, rolls better and is much easier on the rollers and machinery. The bars roll sounder, and are much better finished. The subscriber feels confident that persons who will examine for themselves the machinery in operation, will find it possesses more advantages than have been enumerated. For further particulars address the subscriber at Troy, N. Y.

P. A. BURDEN.

Railroad Spikes and Wrought Iron Fastenings.

THE TROY IRON AND NAIL FACTORY, exclusive owner of all Henry Burden's Patented Machinery for making Spikes, have facilities for manufacturing large quantities upon short notice, and of a quality unsurpassed.

Wrought Iron Chairs, Clamps, Keys and Bolts for Railroad fastenings, also made to order. A full assortment of Ship and Boat Spikes always on hand.

All orders addressed to the Agent at the Factory will receive immediate attention.

P. A. BURDEN, Agent,
Troy Iron and Nail Factory, Troy, N. Y.

CHILLED RAILROAD WHEELS.—THE UNDERSIGNED are now prepared to manufacture their Improved Corrugated Car Wheels, or Wheels with any form of spokes or discs, by a new process which prevents all strain on the metal, such as is produced in all other chilled wheels, by the manner of casting and cooling. By this new method of manufacture, the hubs of all kinds of wheels may be made whole—that is, without dividing them into sections—thus rendering the expense of banding unnecessary; and the wheels subjected to this process will be much stronger than those of the same size and weight, when made in the ordinary way.

A. WHITNEY & SON,
Willow St., below 13th,
Philadelphia, Pa.

Brown's Old Established SCALE WARE HOUSE,

NO. 234 WATER ST., NEW YORK.

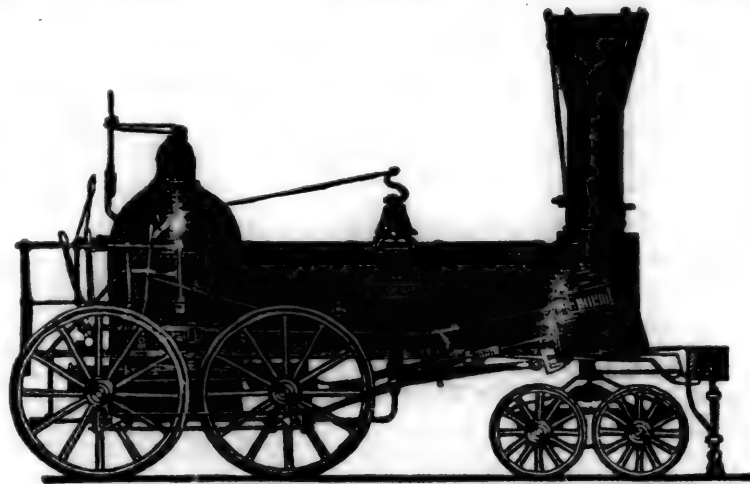
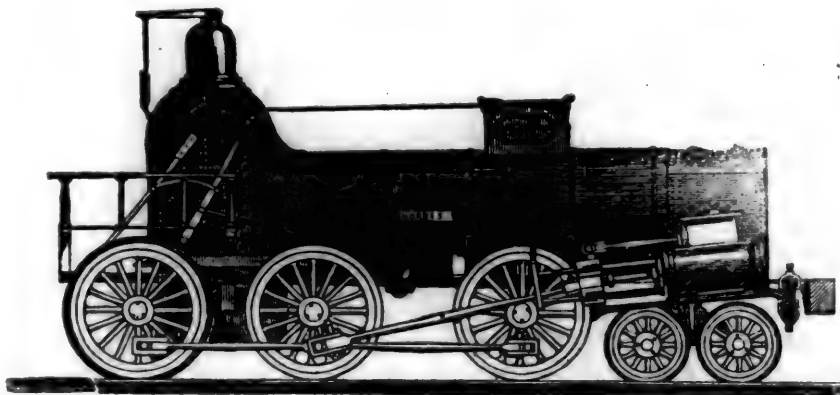
THE Subscriber, Practical Manufacturer of Scales of every description, respectfully asks the attention of Railroad Companies to his Improved Wrought Iron Railroad Track and Depot Scales which for strength, durability, accuracy, convenience in weighing, and beauty of workmanship, are not surpassed by any others in this country.

He is aware that this is rather a bold assertion for him to make, yet he can say with confidence that they have but to be tried to give them precedence over all others.

J. L. BROWN.

Bank Scales made to order, and all Scales of his make Warranted in every particular.

References given if required

NORRIS' LOCOMOTIVE WORKS.
BUSHHILL, SCHUYLKILL SIXTH-ST., PHILADELPHIA,

THE UNDERSIGNED Manufacture to order Locomotive Steam Engines of any plan or size. Their shops being enlarged, and their arrangements considerably extended to facilitate the speedy execution of work in this branch, they can offer to Railway Companies unusual advantages for prompt delivery of Machinery of superior workmanship and finish.

Connected with the Locomotive business, they are also prepared to furnish, at short notice, Chilled Wheels for Cars of superior quality.

Wrought Iron Tyres made of any required size—the exact diameter of the Wheel Centre, being given, the Tyres are made to fit on same without the necessity of turning out inside.

Iron and Brass castings, Axles, etc., fitted up complete with Trucks or otherwise.

NORRIS, BROTHERS

PATENT MACHINE MADE HORSE-SHOES.

The Troy Iron and Nail Factory have always on hand a general assortment of Horse Shoes, made from Refined American Iron.

Four sizes being made, it will be well for those ordering to remember that the size of the shoe increases as the numbers—No. 1 being the smallest.

P. A. BURDEN, Agent,
Troy Iron and Nail Factory, Troy, N. Y.

Etna Safety Fuse.

THIS superior article for igniting the charge in wet or dry blasting, made with DUPONT'S best powder, is kept for sale at the office and depot of

REYNOLDS & BROTHER,

Manufacturers,
No. 85 Liberty St.

NEW YORK.

And in the principal cities and towns in the U. States.

The Premium of the AMERICAN INSTITUTE was awarded to the Etna Safety Fuse at the late Fair held in this city.

November 3, 1849.

ly

COLUMBUS, OHIO,

Railroad Car Manufactory.
RIDGWAYS & KIMBALL,

HAVE established at this central point, the manufacture of Passenger, Freight, Gravel and Hand Cars for Railroads, and assure all Western Railroad Companies that it will be their constant aim to procure the best materials and workmen, and to turn out the best kind of work at fair prices. Specimens may be seen on the Columbus and Xenia Railroad. The patronage of Railroad Companies is respectfully solicited.

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To Inventors and Patentees.

OWEN G. WARREN, ARCHITECT, Has had many years' experience as Agent for obtaining Patents, both in this country and Europe, and will transact such business promptly and reasonably. Persons at a distance can have their business done by correspondence—without the necessity of visiting this city or Washington. Office No. 94 Merchants Exchange, Wall st., corner of Hanover st., up stairs.

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AMERICAN RAILROAD JOURNAL.

STEAM NAVIGATION, COMMERCE, MINING, MANUFACTURES.

HENRY V. POOR, Editor.

ESTABLISHED 1831.

PUBLISHED WEEKLY, AT No. 136 NASSAU ST., NEW YORK, AT FIVE DOLLARS PER ANNUM IN ADVANCE.
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ASSISTANT EDITORS,

J. T. HODGE, *For Mining and Metallurgy.*
GEN. CHAS. T. JAMES, *For Manufactures and the Mechanic Arts.*
M. BUTT HEWSON, C. E., *For Civil Engineering.*

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American Railroad Journal.

PUBLISHED BY J. H. SCHULTZ & Co., 136 NASSAU ST.

Saturday, September 21, 1850.

Pacific Railway.

TO THE EDITOR OF THE R. R. JOURNAL:

St. Louis, September 5th, 1850.

SIR—I send you a copy of the St. Louis Intelligencer, containing a notice of certain railroad meetings in the western counties of Missouri, from which you will judge of the spirit which prevails in regard to the construction of the Pacific railroad.

The interest taken in its immediate construction is commensurate with the disadvantages under which the farmers and merchants now labor. The lands being of the best quality and easily worked, there is every encouragement to improve them, but except on and near the Missouri river, the expense of transportation to a market is so great as to discourage all surplus production. The staples of the country being agricultural—hemp, wheat, to-

bacco and corn, the business of the merchant is dependent on the activity of the farming population. All, therefore, suffer, and suffer proportionally to the richness of the land, from the want of facilities of transportation. The flour of Missouri is becoming generally esteemed for its superior quality, and the hemp grown here is said to equal the best Kentucky hemp; but the excess of either of these sent to market now is trifling compared with what it is destined to be when the unoccupied lands shall have been brought under cultivation.

The greater part of the stock of this railroad will probably be taken up within the State, because the advantages which it offers as a safe investment cannot be so well understood elsewhere. I will briefly sketch these, but the precise route of the railroad not being determined yet, I am not able to give you.

The Pacific railroad company of the State of Missouri, possesses a very liberal charter from the State, authorising it to construct a railroad from St. Louis, westerly, to the State-line in Cass county, and authorising it to purchase and hold real estate. The company does not, as its title might imply, propose to extend its operations beyond the State line. It will form one link, and evidently an important one, in the great line of communication destined to be opened over the plains, to the Pacific near San Francisco, and it will also form a link of another line of communication which by and bye will be projected towards Santa Fe, connecting the territory or State of New Mexico intimately with the seaboard States, with which her connection now can only be said to be nominal.

But not to dwell on these future large sources of business, which by some will be looked upon as more problematical and speculative than they really are, the Pacific railroad company can look forward to an immediate revenue on the completion of the road, from sources in active operation, of which we have a present knowledge and experience. These are—

1st. That portion of the present California emigration, which, concentrating at Kansas and Independence, commences there its journey across the plains. 2d. The passenger travel, and part of the freight of the Upper Missouri, from the vicinity of Independence upwards. 3d. The legitimate passenger and freight business of the rich country through which the road passes.

The emigration to California cannot now reasonably be looked upon as a temporary or speculative source of revenue. The gold diggings are not found to run out, but on the contrary the extent of the workings is on the increase. The returns of patient labor there are not found to be of the nature of a lottery. They have proved to be entirely reliable, and a man of industrious habits and good health can certainly earn, after allowing for all expenses, a per diem, far exceeding what he can obtain in the old States. He labors hard for one or two seasons, and then generally returns to his native State with the result of his accumulations, which there becomes a capital on which to base, whether as farmer or merchant, a fair business.—These circumstances, while they continue to exist, will maintain and increase the present course of emigration, and the foundations are in the meantime being laid of other sources of business on the Pacific whose importance will soon become more apparent.

The emigration across the plains during the past season is estimated by those who have attended to the reports of the numbers of wagons passing certain points at 40,000 persons;—of this number 10,000 are estimated to have passed through Independence and Kansas, coming from the lower part of this State, and from the States of Ohio, Indiana and Illinois. A large part of the emigration passed through St. Joseph, and the remainder entered on the plains from numerous points along the State-line as convenience dictated, all of them concentrating on a common trail before reaching Fort Laramie.

Now it is reasonable to suppose that had there been a railroad from St. Louis to the State-line a much larger proportion of the emigration would have concentrated upon the extreme end of the railroad, because that point would have been reached from St. Louis by railroad in one day, where from four to twelve days must have been occupied, according as the companies of emigrants passed up the river by steamboat or travelled with their wagons by land. Their entire equipments could be carried by railroad, wagons, cattle and provisions. They would thus be enabled to commence their journey on shorter notice, and with their animals in better condition. These reasons and the natural increase of the emigration will bear us out in estimating it at from 20,000 to 25,000 persons starting

from the State-line in the spring after the completion of the road. According to recent returns, over three-fourths of the entire emigration to California reaches the Pacific by way of the plains now; and it must not be lost sight of that were a railroad constructed across, this mode of reaching California would be incomparably the shortest and cheapest when compared with what are termed now the short routes, by way of Panama or Tehuantepec.

The government service will itself be considerable in the course of a few years on the routes to San Francisco and Santa Fe. A line of mails have been established this summer to Santa Fe. Military posts will be established on both routes and troops are already on their way up the country destined for this service and for the protection of convoys of emigrants, although the number of these troops is thus far entirely insufficient for the service. These sources of revenue will be found to be very considerable.

The second source mentioned, was that of the business of the valley of the Upper Missouri, embracing from the neighborhood of Independence to St. Joseph, Fort Leavenworth, Council Bluffs and upwards. Whatever general route may be adopted for the railroad, it seems to be generally concluded that a branch will be made to the Missouri River, in Jackson county, if the main line should follow the river there.

The distance from Independence to St. Louis by the railroad will be about 280 miles, by the river the steamboat distance is given as 429 miles. I mention Independence merely as a point of comparison.

The character of the Missouri river is most favorable for railroad competition, because its navigation is unusually difficult and tedious. The experience of all who have travelled on it may in this respect confidently be referred to. From ice and low water there are about three months of the year lost on an average. At present the steamboats running on the river are of the smallest class, unable to carry much freight, because the water on the bars is only 3½ feet. There are abundance of snags on the river; the channel is very variable from the light nature of the soil of the valley in which the stream meanders, and the rapidity of the current combined. The current runs at the rate of three to five miles an hour. Boats running down the river do not travel during the night except in the highest stages of the water. The passage consequently occupies from Independence to St. Louis ordinarily 3½ days, when there are no interruptions by grounding on sand bars. During the past week these interruptions have been frequent. In the trip up the boats generally run during the night, because a boat running up stream can be got off a bar comparatively easily. The time of making the passage is about the same either way, as the rapidity of the current does not admit of making more than an average of 4 to 5 miles an hour up stream, exclusive of the delays at the landings. The peculiar character of this river deserves a more minute description, but enough has been said to show that at Independence the travel proceeding to St. Louis from the Upper Missouri would not be likely to hesitate between a safe passage to St. Louis easily in one day, and a tedious and hazardous passage down the river in from three to four days. The same reasons would govern the travel from St. Louis to Independence, and the better class of freights would take the same direction. A line of steamboats would then be established on the Upper Missouri, connecting with the railroad, and gov-

erned as steamboats are not now on these rivers, by its necessary regularity.

An examination of the map and some reflection on the character of the lands of the Upper Missouri will satisfy any one that the business from that source alone will be very important. The number of steamboats which ply on the river now sufficiently indicate this. The business of the Upper Missouri will be vastly increased by a mode of communication which shall be as regular in winter as in summer, in low water as in high water, and which shall admit of the staples of the country reaching market probably at any time. This second source of present revenue is considered very important and reliable.

The third source mentioned, is the local business of the country along the line of the road. Whatever route may be adopted the agricultural tonnage must become shortly very important. The prairie lands are rich and productive, and can be brought rapidly into use. The returns of wheat, corn and hemp and stock are destined to be very large.—There is no such thing as unproductive land in this section of country. In the neighborhood of St. Louis, and for 260 miles, mostly along the line of the road, traces of coal are found in the streams.—In the neighborhood of St. Louis the coal is worked to advantage, and finds a market in that city. At the crossing of the Osage river near Jefferson city, the coal is also worked, and it has been worked on some of the branches of the Gasconade river, where it crops out. There are other points in the neighborhood of Boonville, Georgetown, Mount Pleasant, Lexington and Independence, where it is worked to a trifling extent, and chiefly for the supply of blacksmiths, the seams which crop out in these localities being too thin to warrant extensive workings.

The extent and character of the coal basin of the upper country is very little understood, there may exist heavy beds of coal below those thin beds which crop out on the surface. An examination by a proper geologist, and frequent borings, are wanted to understand the full extent and value of this immense and universal basin. Lime accompanies the coal. On the Merrimac river, there are large supplies of iron ore, and furnaces are in operation at three points. The iron produced is well known as of a very superior quality. On the Osage river the ore is also found, but it is not worked. There are numerous indications of copper veins on the Merrimac river, and there are some furnaces in operation, but the extent of these veins is little understood. The labors of a good practical geologist are everywhere wanted to give positiveness to the vague information which exists now in regard to the mineral resources of this entire region of country.

I have thus endeavored to indicate the principal sources of revenue which warrant us to take hold of our railroad enterprise to the State-line, with courage and confidence, and I have stated them, in my opinion, with great moderation, and without dwelling on the legitimate increase which the history of all railroads warrants us to expect from the peculiar business facilities which they present. I have not the leisure nor statistics now to place the statement before the eye in figures, nor would it be so reliable to the general reader, as a fair conception of the large fountains of business to which his attention has been directed, the value of which he can himself form some estimate of, and one much more likely to fall short of the result than to exceed it.

The surveys of this road are in active progress three parties being in the field; the company anticipates being able to have the first hundred miles from St. Louis prepared for contract in the course of next spring.

Your obedient servant,

A. SUBSCRIBER.

The Breaking of the Iron Bridge on the New York and Erie Railroad.*

What was the cause of the accident? And how should it affect the confidence in the iron bridges generally on railroads? are questions in which the public are generally interested, and which I, being a bridge engineer and builder, am particularly interested. The latter consideration induces me to attempt an answer to these inquiries; and the former, I hope, will induce others to read and consider, according to their merits, the following remarks and statements.

I have not seen the bridge in question, and therefore cannot speak positively as to the sizes and proportions of its parts; but I have seen several bridges built on the same plan, and by the same parties, and suppose this to have been proportioned in accordance with their usual practice.

Now, more than one person can testify to my having frequently remarked, in relation to those bridges, that they were *badly proportioned*, and that in certain parts which I have pointed out, they did not contain half enough iron to render them safe and reliable; that I was surprised that they endured as much as they did, and should not be disappointed to hear of their failure at any time.

Moreover, on page 754 of the American Railroad Journal for 1847, will be found an article by me, in relation to the iron bridges on the Harlem railroad, (one of the same kind,) just north of the Yorkville tunnel, in which I gave measurements and calculations, showing that certain parts of the wrought iron in that bridge, to wit, the chords, technically so called, were subject to a stress more than twice as great as the limit of safe strain, established by long experience, and adopted by engineers generally, with slight modifications, according to the views of different observers and experimenters. I will quote one or two paragraphs from that article:

"It appears, then, that a portion of the wrought iron in the bridge in question, is liable to a stress of more than 26,000 lbs.* to the square inch, from a dead load on one track of 1,000 lbs. to the foot run, and yet the bridge endures the daily and rapid transit of the trains of the Harlem railroad."

"If, then, bridges be built on the plans given in my work on bridges, which are estimated to sustain *twice* the above weight, or 2,000 pounds to the ft. run, with a stress of 10,000 lbs to the square in. of wrought iron, on any part, instead of 26,000 lbs. as above or less than one-fourth† the stress for the same load, will not the chances of failure be reduced almost beyond the range of possibility, as far as wrought iron is concerned?"

The point there attempted to be established was, that if bridges badly proportioned, with some parts exposed to excessive strain, would endure at all, how much more might those be relied on in which the greatest strain was only a fraction of what certain parts of the former were enduring.

Now the bridge which occasioned the catastrophe on the New York and Erie railroad, on the 1st instant, was of about the same length as that on the Harlem road, here referred to, and *probably* was similarly proportioned, the lower chord in each truss containing four square inches in cross

* The absolute capacity of wrought iron for sustaining tension is about 60,000 lbs. to the square inch of cross section, and the limit of safety is usually reckoned at about one-fourth of that amount, or 15,000 lbs. to the square inch, though for railroad bridges I have assumed it at only 10,000 lbs.

† This reads $\frac{1}{4}$ in the printed article, but it is manifestly a misprint, or mistake in the copy.

section, with one-fourth of the same cut away in forming bolt holes, leaving only three square inches in the weakest parts. The truss, moreover, I suppose to have had a depth equal to about one-tenth the length of span; and for such a length and depth of truss, for a single track railroad bridge, I should have put in at least ten square inches of cross section of wrought iron, in the middle of the lower chord, with other parts similarly proportioned with regard to the stress they were liable to.

Now I suspect that the lower chord in the neighborhood of the centre was the part that first gave way, in consequence of being too small. If it was not so, it only proves that there were other parts still weaker than that, to which I had never given attention. My attention was turned to that point, because that struck me as the most defective in proportions, and the most easily demonstrated to be so, and having established that point to my own satisfaction, I did not feel interested to go into further detail.

The cause of the failure, therefore, I conclude to be the bad proportions of the structure, and weakness, i. e., want of proper size, in some of the parts, defects noticed and frequently spoken of by me, (in relation to other bridges on the same plan) years ago; that the accident affords no just grounds of apprehension from iron bridges properly proportioned and constructed, nor of discouragement from the introduction of such bridges on railroads.

Now the most important practical lesson taught by the sad catastrophe which gave occasion to this article, as it appears to me, is that a better understanding of the mechanical principles involved in the construction of bridges should prevail among engineers, and those having charge of such works, and that no structures of the kind, either of wood or iron, should be adopted or admitted, unless scientifically and systematically planned and proportioned throughout.

Since writing the above I have seen the resolution of the directors of that road for the *disuse* of iron bridges upon their road in future, and for the removal of two small bridges built by me near Binghamton.

The measure may be one of policy or expediency for the company, as the public is liable to reason from the failure of one iron bridge that all iron bridges are unsafe, however differently planned and proportioned. But if any confidence can be placed in the preceding statements, the folly of taking the failure here spoken of as any evidence of unsafety in those remaining will be sufficiently apparent.

It would seem that this summary condemnation of iron bridges by the directors of the New York and Erie railroad company is founded on the fact that an iron bridge may "break suddenly and without any previous warning." Did it occur to them that many of the bridges considered as wooden bridges depend for their support on iron bolts and fastenings, which are equally liable to "break suddenly, without warning;" and that their breaking would be equally as fatal to the structures of which they compose parts as the breakage of a corresponding part of an iron bridge.

Look at the Howe bridges, on one of the most popular plans now in use for railroad bridges in this country. Think of a bridge of 150 feet stretch, with some 9-10 of the structure, and all but 1-15 part of the load (and a railroad bridge should be able to bear with safety a load of 2,000 lbs. to each running foot) suspended by 8 iron bolts of 1½ inches in diameter, and this cut down by screw threads to a trifle over 1½ inches diameter, leaving not to exceed 15 square inches to sustain the whole weight.

Now, 9-10 of such a structure could not weigh less than 100,000 lbs. which, added to 280,000 for the 1-15 of the maximum load, gives 380,000 lbs. to be sustained by 15 square inches of wrought iron; showing 25,333 lbs. to the square inch as the average stress upon all of that set of 8 bolts; and those bolts, being in pairs, one pair in each corner of the bridge, are in no wise certain of sustaining the same stress, and the breakage of any one of them would suddenly throw such a stress upon its fellow as would be almost certain to break it and cause the immediate downfall of the bridge.

Then look at those doomed iron bridges built by me at Binghamton, in which no man can point

out an important piece of wrought iron which, under a load of 2,000 lbs. to the running foot can be demonstrated to sustain a tension exceeding 10,000 lbs. to the square inch of cross section, or any other part more severely taxed, in proportion to its safe capacity. Having duly contemplated this picture and that, let us pause for a moment, and admire the wisdom, or commiserate the ignorance, of those who tremble at crossing the iron bridge, while they feel fully at ease in passing over the so called wooden structure, whose stability depends on the same kind of material, exposed to double, and almost treble the stress which it sustains in the other structure.

Utica, August 7th, 1850.

S. WHIPPLE.

Oxygen.

Continued from page 563.

First on our list are the cotemporaries, Robert Boyle and Dr. Hooke; both celebrated for their love of truth, but, in nearly every other respect, differing as widely as possible. Boyle was the attractive, elegant and insinuating Irish gentleman. Hooke, the cool, cautious, and sarcastic observer. Boyle found ready panegyrists for all his acts, and one of his admirers has forever immortalized his own lucubration by commencing with the memorable sentence, "Robert Boyle, the father of chemistry and brother to the Earl of Cork"—thus making his lordship uncle to chemistry; a case of nepotism without a parallel. Hooke was less fortunate, if fortune is to be reckoned by the amount of written praise, for one of this acquaintance thus speaks of him: "He is very crazy, much concerned for fear he should outlive his estate. He hath starved one old woman already, and, I believe, he will endanger himself to save sixpence for anything he wants." The same friend (?) writing after Hooke's decease says: "I wonder old Dr. Hooke did not choose rather to leave his £12,000 to continue what he had promoted and studied all the days of his life, I mean mathematical experiments, than to have it to go to those whom he never saw or cared for. It is rare virtuosos die rich, and it is a pity they should if they were like him."

Boyle was born in Ireland in 1627, and died in London in 1691. He repeated Le Brun's experiment of the calcination of tin; and finding that the calyx could not be formed without the assistance of heat, and apparently not noticing that air was also necessary, he adopted the idea that calces were the compounds of heat with the respective metals; the increase of weight being due to the fixation of that amount of heat.* That Boyle should have neglected the action of air is especially remarkable, because he was the first to introduce the air pump into England, and by its aid experimented upon the utility of air in ordinary combustion. He found that gunpowder, in the exhausted receiver, could be ignited by a burning glass, whereas other combustibles would not inflame; and hence he concluded, that the nitre contained in the powder was concerned in furnishing materials, now known to be oxygen, to supply the place of air.

Dr. Hooke was born 1635, and died 1702. His experimental researches are not his only claims upon posterity, for the inculcation of the sentiments expressed in the following brief quotations from his works, will always demand respect. In his preface to the "Micrographia," he thus warns the lovers of hypothetical speculation: "In this investigation, upon which the desirable reform in philosophy is to be founded, there is not so much required any strength of imagination, as a sincere hand and faithful eye, to examine and record the things themselves as they really appear."—"The science of nature has been too long made the work of the brain and of the fancy; let it now revert to plain and sound observation; let there be rigor in admitting, strictness in comparing, slowness in debating, and shyness in determining." The understanding "must watch the irregularity of the senses, but not go before them, or prevent their informa-

* If it be said that heat and phlogiston are here synonymous, it must be remarked, that if it be so, then Boyle must have reversed the phlogiston theory: he says, metals during calcination combine with heat (phlogiston?); the theorists said, by calcination a body became dephlogisticated, i. e., was deprived of phlogiston (heat?).

tion; it must examine, range, and dispose of the bank which is laid up in the memory; but it must be sure to make distinction between the sober and well collected heap, and the extravagant ideas and mistaken images which there it may sometimes light upon." Speaking of himself, he says, in the true spirit of a philosopher, i. e., a lover of wisdom, "If ever I have ventured at small conjectures respecting the causes of the things I have observed, I beseech the reader to look upon them only as doubtful problems and uncertain guesses, not as unquestionable conclusions, or matters of unfutable science." We could almost wish to possess the fabled powers of some eastern potentates; we would first cause this sentence to be written in letters of gold, and then would issue an unalterable decree, compelling its hourly repetition by all speculative philosophers, under pain of instant destruction of their unread productions. In the sixteenth section of the same work, he notices the necessity of the presence of air in common combustion. In its absence, wood is converted into charcoal, which glows but does not burn. He argues that air is the universal solvent of combustible bodies. The term "solvent" being employed, we suppose, in the same sense as applied to air when it is said to dissolve water by evaporation; that is, in a state of very intimate mechanical mixture or adhesion, and not in that still closer connection which is now conceived as chemical combination: for all chemical operations, such as the formation of salts and alloys were generally explained mechanically, and were even definitely assigned to the peculiar effects of certain arrangements of hooks and eyes, clefts and wedges, and similar contrivances. Hooke, in further illustration of this solvent power, says, that it is exercised only by a small proportion of air, which is like unto, or the very same, as that which is fixed in saltpetre, oxygen; and hence the atmosphere is like those spirits (spirits then signified many things besides alcoholic liquids, thus the acid solvents of the metals were termed spirits, as, spirits of salt and of nitre, substances now known as hydrochloric and nitric acids, etc.) which have much phlegm, impurity, in them, and soon become glutted, whereas saltpetre abounds more in those solvent particles, and hence a little will dissolve a great sulphureous body quickly and violently; and as other weak solvents will quickly consume the dissoluble body if applied in sufficient quantity, so air applied to a combustible, by a draft or by bellows, will dissolve it as rapidly as saltpetre.—Whence, he concludes, there is no element of fire, but that flame is the result of the mutual agency of the combustible and part of the atmosphere. He also particularly alludes to the use of air in respiration, but does not appear to have followed up these investigations. In a later work, "Lampas," 1677, he explains, in a very beautiful manner, the phenomenon of the flame of a candle; and by holding it in a thin piece of glass or mica, he observed its section, and showed that the interior is not luminous. Hooke's doctrines were also independently illustrated by John Mayow, born in Cornwall, 1645, died in London 1679. At least Mayow never names Dr. Hooke, and we must, therefore, in the absence of proof to the contrary, charitably suppose that he was unaware of Hooke's labors.—Mayow's views on respiration are particularly remarkable as being the first which are worth reviewing. He experimented by placing a burning candle and a living mouse under similar bell glasses, and noting the duration of flame and life thus situated. He then placed a candle and mouse together under the same bell glass, and found that life and flame were extinct in a proportionally shorter interval of time. He also varied the experiment by endeavoring to burn a candle in air spoiled by breathing, and to support life in air vitiated by combustion. Failing in both instances to maintain either flame or life, he concluded "that the nitro-aerial particles are absorbed both by the candle and by the animal." The then prevailing theory ascribed to respiration the property of cooling the blood; but having observed the necessity of the "fire-air" particles in ordinary combustion, he considered their absorption as necessarily connected with the heat of the blood.

Dr. Stephen Hales, born in Kent 1677, died at Teddington 1761, may be said to be the first who fairly laid the foundation of pneumatic chemistry,

the chemistry of the gases. Mayow and others hewed and dressed many stones, but Hales laid the foundation, and Priestley afterwards raised the scaffold, and devised implements for future use.—The building is still unfinished, and honest hard-working laborers are in request; we might venture to say there are also good openings for good architects.

Hales' experiments are exceedingly curious, and his conduct well exemplifies the danger of a strong adherence to a mere theory. He had started with the idea that all gases were only so many modifications of common air, and though he actually procured hydrogen, coal gas, oxygen, and carbonic acid gas, as well as many others, yet he contented himself by measuring their quantities, and took no heed of their remarkable and distinctive properties. He also observed that calcined tartar, containing much caustic potash, partially purified air that had been spoiled by breathing; but instead of detecting its specific action, its combining with the carbonic acid gas, he confounded it with the mere absorbing powers of some other kinds of salts. In fact, no man was ever nearer the discovery of important truths, and so wilfully neglected his opportunities. A fatality appears to have attached itself to all he did. It was the fatality of seeking facts to establish a theory, instead of contentedly accepting facts for their own sake, until they should embody forth their own theory of truth. It was the dog and the shadow—hypothesis against induction; and we are almost led to believe that Hales must have originated the saying, which has been, perhaps, rather too vain-gloriously generally ascribed to a foreigner—"If facts do not agree with my theory—why, so much the worse for the facts."

To be continued.

SUBMARINE TELEGRAPH.

The Submarine Telegraph between Dover and Calais was laid during the last week of August, and England is now connected with the continent telegraphically. The operation of laying the wires was performed by the aid of a steamer. Between the paddle wheels, in the centre of the vessel, was a gigantic drum, or wheel, nearly fifteen feet long, and seven feet in diameter, weighing seven tons, and fixed on a strong frame work. Upon it, was coiled up, in careful, close convolutions, about 30 miles of telegraphic wire, one tenth of an inch in diameter, encased in a covering of gutta percha, the thickness of a little finger. The point proposed to be reached—Cape Grinez—the nearest land mark to the English coast, and between Calais and Bologne, is a distance of 21 miles, so that a surplus supply of nine miles of wire was held in reserve for the purpose of slackening. The route was marked by a series of pilot buoys. The vessel steamed out at the rate of three or four miles an hour into the open sea, in a direct track for Cape Grinez. The operation of paying out the 30 miles of wire commenced on a signal to the sailors to "go ahead with the wheel, and pay out the wire," which was continuously streamed out over a roller at the stern of the vessel, the men, at every 16th of a mile, being busily engaged in rivetting on to the wire square leaden clamps or weights of from 14 to 24 lbs., which had the effect of sinking the wire in the bottom of the sea, which, on the English coast, commences at a depth of 30 feet, and goes on varying from that to 100 and 180 feet. The whole of the casting out and sinking was accomplished with great precision and success, owing to the favorable state of the day. This is the most extensive experiment yet made in carrying the telegraph under water.

COAL BANK.

The Chattanooga Advertiser, of the 4th instant, says: Col. Jas. Vaughn, of Monroe county, called at our office on Monday last, and informed us that he had recently opened a fine vein of bituminous stone coal in Roane county, about three fourths of a mile from Joseph Kimbrough's, and three miles from the Tennessee river. The vein is about 17 feet wide by 12 in thickness. He is taking about 100 bushels per day to each hand engaged. Col. Vaughn has a contract with Cooper and Wiley, of Cass county, Georgia, by which he expects to lay down at our landing 2,000 bushels of coal a week.

STAITE'S ELECTRIC LIGHT.

Mr. Staite exhibited his electric light from the light house on the South pier, Sunderland, on Monday evening last. He was invited by the commissioners of the river Wear, in order, it found suitable, that it might be adopted as the permanent means of illuminating the new dock. Towards evening thousands thronged the quays and piers; and many took trips to sea to witness the effect of the light several miles from the land. The apparatus was erected upon a temporary platform raised a few feet above the light house, on the South pier—the galvanic battery being placed in a shed below. We learn by the Sunderland Herald that at ten o'clock exactly the anxious spectators were gratified by the first glimpse of light, which was shown by a parabolic reflector. It was first directed towards Hartlepool, Seaham and Ryhope, and then brought gradually northward, by the reflector being moved slowly round—all the while, however, the beams falling inland.

The light was then sent successively upon the docks, St. John's Chapel, the quays, piers, and then toward Roker and Whitburn. On all these places a bright stream of light was thrown with a marked effect; and at times the brilliancy was such that persons were obliged to desist gazing upon the light house. At the farthest end of the piers the illumination was so great that one individual could distinguish the features of another at a considerable distance—in fact, the pier, from end to end, had the appearance of a fine promenade, splendidly lighted up. When directed toward a vessel which happened to be entering the harbor, it rendered every object on deck clearly visible; and any one possessing an ordinary power of vision could easily make out the smallest print.

At Ryhope, three miles off, a lady was enabled to read a letter which she had never opened; and at Whitburn, two miles distant, in an opposite direction, the Herald was read on the sands by several individuals, when the reflector was in such a position as to cast a beam of light in that direction. The iron bridge which crosses the river Wear, three quarters of a mile from the pier, was crowded; and indeed almost everywhere that it was known the light was to be exhibited, parties were eager to obtain a glimpse of it. At half past ten o'clock the commissioners proceeded out to sea, a distance of seven miles, in the Sea Horse steamer, at which distance the pier light was invisible; while the electric light shone clear, bright and effulgent as ever; and a captain might have brought his chart on deck and consulted it with ease.

The following letter received by Mr. Meik from Mr. Reid, harbor master at Seaham, seven miles off, shows how it was distinguished there: "I was favored with your note yesterday, with the information that the electric light would be shown at Sunderland last evening, and I beg to express my best acknowledgements for it. I observed the light burst out with great splendor at about the time appointed, and it continued with varied intensity until 11-25, when it suddenly increased both its apparent size and intensity to a light of surpassing splendor, reducing the other lights near as seen from Seaham North pier to the veriest sparks." We understand that the commissioners expressed their decided unanimity on the complete success of the experiment.

Lead for Statuary Purposes.

An Edinburgh correspondent of the Athenæum very justly urges the advantages to be gained by the adoption of lead in statuary work, and instances the equestrian statue of Charles the Second, erected in Parliament Square by the magistrates of the city, in honor of the Restoration, and undoubtedly the finest piece of statuary in Edinburgh, as a fair example of the capabilities of the material.—Many who hear of this proposal for the first time, will smile at the idea of applying so soft a material as lead for an office which bronze and granite usually fill, and indeed many even of the Edinburgh residents are ignorant of its successful employment in the work to which we have alluded. That it is really lead, has been ascertained beyond a doubt, as a few years ago the horse's shoulder sank, owing to the failure of one of the iron supports, when the statue was taken down, the sunk parts beaten out, and new supports put in, with a filling-

up composition, making it as good as ever. Seeing this acknowledged to be superior to any other bronze or marble statues which adorn the city—and Edinburgh possesses a goodly number, from the hands of the most eminent masters—it must be admitted that the qualifications of lead have been strangely overlooked by the modeller. As regards durability, King Charles has stood 165 years, and yet retains its original excellence.

Alleged Propulsion of a Vessel by Steam in the Year 1543.

T. Gonzales, Director of the Royal Archives of Simancas in Spain, published in 1826 an account of an invention by Blas de Garay, a naval captain, who, it is stated, exhibited in Spain, in 1543, an engine, by which ships of the largest size could be propelled in a calm without the aid of oars or sails. He made an experiment before the commissioners, appointed for the purpose of examining his invention at Barcelona, on the 17th June, 1543, the vessel used being a ship of 200 tons. Garay, we are informed, wished to keep his mechanism a secret; but it was observed to consist partly of a large caldron or vessel of boiling water, and of two moveable wheels, on one side of the ship. The experiment succeeded so far, that the vessel was propelled at the rate of two leagues in three hours; and the inventor was rewarded by receiving a sum of 200,000 maravedis, besides having his expenses defrayed from the public treasury. It is added, that the invention would have been further encouraged had not state expeditions of great consequence claimed the immediate attention of the emperor.—But it is important to mention, that the authenticity of the entire history of Garay's invention, as published by Gonzales, has been called into question, and that no practical results of any utility followed. —*Frazer's Magazine.*

Railroad Letting.

On Tuesday last the grading, bridging and tunnelling of about twenty miles of the Covington and Lexington railroad were placed under contract.—Some two hundred bids were put in. We understand the contracts were made on terms favorable to the company. The cost will not exceed the engineer's estimate, and the contractors take \$55,000 in the stock of the company. Active operations will be commenced immediately.—*Covington Journal.*

Valuable Invention.

Letters have recently been issued from the Patent Office at Washington, to Mr. E. G. Pomeroy of St. Louis, for an invention by which he professes to coat iron with copper so as to fit it for many useful purposes to which it is now suited. By Mr. P's process, which is described as simple and cheap—the iron is first immersed in sulphuric acid, or some other acid, to remove all impurities from the surface. When dry, it is dipped into clay sufficiently moistened, to leave a thin coating on the iron. It is again dried over a brisk fire, and then immersed several times into molten copper.—Enough of the copper adheres to the iron, it is said, to cover the surface completely, after which it may be passed through rollers to reduce it to the required thickness, and the result is a smooth surface, fully equal in brightness to pure copper or brass. The coating is perfect, and appears not simply to adhere to the iron, in a thin layer, but to be completely amalgamated with it so that on hammering it the coating does not separate, but remains as firm and durable as the iron itself.

The editor of the St. Louis Intelligencer, who has seen some samples of iron coated by this process, speaks of the matter as follows:

"If this invention is what it purports to be and what we believe it is, it will be found useful in an infinite variety of forms; in the sheathing of vessels—the roofing of houses—in steam boilers and chimneys—and a great variety of other things. In the single article of spikes and bolts, and other fastenings for ships and vessels, the saving will be

enormous. Iron spikes and bolts are much better and stronger than copper. Coated by this process, they will resist the action of salt water, and gallic acid of the wood, as perfectly, will be much better in other respects, and will not cost half as much.

In truth we can perceive no reason why iron should not supersede copper in almost all the uses to which it is applied, if this invention be what it is claimed to be.

Pennsylvania.

Many of the leading public works of this State have received very severe injuries from the recent disastrous freshet with which they have been visited. The Reading railroad has been repaired, and commenced the transportation of coal on Monday last. The Schuylkill Canal will not probably be opened again for this season. This company have raised \$200,000 for repairs, and is now actively engaged in making them. The Lehigh Canal will not be opened, it is now stated, till some time in October—probably the latter part. The Delaware and Hudson Canal was not very severely injured, and is again in operation. All the local coal roads are more or less injured. Some will soon be at work again, while others will require the rest of the season to put them in order.

Independent of the losses to the owners of these works, the influence which the interruptions to their regular operations thus caused, will have upon the price of coal, is a matter of great interest to our whole community, which draws so large a part of its fuel from Pennsylvania. It shows how important are the coal fields and public works of that State to our comfort and prosperity. The suspension of business on these works for a period of six months, would produce a general bankruptcy. The whole machinery of business would stop with the loss of our motive power. Next to the failure of food, in importance, is that of fuel.

In relation to the probable amount of supply of coal for the rest of the season, we copy the following from the Pottsville Journal:

For the information of our readers abroad, we give the following as the probable state of the coal trade for this year.

The supply from the Lehigh will be short this year about.....220,000 tons.
Lackawana.....100,000 "
Wilkes-barre, Pinegrove, &c..... 50,000 "

Tons.....370,000 "

Making the supply this year fall short of the supply of last year 370,000 tons, without taking into consideration the Schuylkill region. Add to this 200,000 tons for the increase in the consumption for the year, which is a very moderate estimate, and the deficiency of coal in the market this year will exceed half a million tons.

The supply from the Schuylkill region is now nearly the same as last year to the same period.—The railroad and canal last year sent to market from September 14th, to December 1st,

1849.....461,961 tons.
In December, 1849..... 89,357 "

Total tons.....551,288 "

Should the Reading railroad company obtain additional facilities, and no further interruptions take place, or the snow storms in November and December not prove too numerous they can transport this quantity to market the balance of the year.—Should the supply fall short of the quantity named from this region, it would increase the deficiency.

Our operators at present hold white ash coal at \$2 50, and red ash at \$2 75 per ton. These rates, under existing circumstances, are reasonable, and will hardly remunerate them for the losses they

have sustained. Our impression is that these prices will be more likely to advance than recede. It is the determination of the operators here, who have wharves at Richmond, to purchase all the coal they can ship from their wharves, and thus prevent the middle men at Philadelphia, who have no interest in Schuylkill county, from depressing prices. This course is rendered necessary for self preservation, and we hope that all those who have no shipping facilities, will make the effort to dispose of their coal to those first, before trying elsewhere; and under no circumstances sell to the middle men below, for a less price than to the operators here who are engaged in mining. Such a course will not only secure good prices for the season, but will remedy many of the evils hereafter under which the trade has been laboring for the last eighteen months.

Both the Lehigh and Lackawana companies refuse to take any further orders. They cannot supply their present contractors—and all the coal the former region can furnish this year will be absorbed by the iron works on the line, and the line trade. It is doubtful whether a ton will reach tide this season.

The large prospective business thus thrown upon the Reading road, has given that stock a great impulse in the market, and with the largely increasing receipts, it will probably go to a much higher point than it has reached for years.

Connecticut.

The annual meeting of the stockholders of the New Haven and Hartford railroad company was held at Hartford on Tuesday. The report of the directors exhibit the affairs in a very prosperous state.

The income for the year ending August 31, 1850, was\$490,931 45
The expenditures for the same period were..... 234,475 80

Balance for net receipts.....\$256,455 65
For the year ending September, 1847, the receipts amounted to.....\$267,814 32
For the year ending Sept., 1848..... 344,762 87
Increase\$76,948 55
For the year ending Sept. 1, 1849..... 373,970 04
Increase\$29,207 17
For the year ending Sept. 1, 1850..... 450,757 63
Increase\$76,787 67

The whole number of passengers transported on the road the current year was 386,876, being an increase over the last year of 66,129. The total number of miles run by the passenger and freight trains is 216,300. The directors have declared a semi-annual dividend of five per cent., payable on the 1st of October; and a vote was passed by the stockholders declaring it expedient that the directors should, within the ensuing six months, declare an extra dividend of not less than five per cent. to be paid in cash or stock, at their discretion. There is an apparent surplus of earnings of \$200,000, which is now invested in construction account—tracks, deposits, steamboats, etc.; but nearly half of this will be absorbed by depreciation, etc., leaving 100,000 clear surplus, which it is the design of this vote to have represented by the issue of new shares and divided among the stockholders either in cash or stock, as the directors shall deem expedient. There was little or no opposition to the vote as it finally passed.

The grading for the double track between Berlin and Meriden is nearly completed, and the track will soon be brought into use. The sum of \$187,251 has been expended in the construction of the branch road to Middletown. Of this amount \$100 were subscribed by the citizens of that place. So far as completed it was opened in March last, and the amount of business contributed by it to the main line has been satisfactory. A proposition to offer to the present stockholders of the 7 per cent. bonds of the corporation which have three years more to run, 6 per cent. bonds payable in ten years, in exchange, was voted down, after some discussion.

The following gentlemen were chosen directors for the ensuing year, viz:

Charles F. Pond and Charles Boswell, of Hartford; Elisha Peck and Cornelius Vanderbilt, New York; Chester W. Chapin, Springfield; James S. Brooks, Meriden; Frederick R. Griffin, Guilford; Ezra C. Reed, New Haven; Ebenezer Jackson, Middletown.

Indiana.

The business of the Wabash and Erie Canal shows the same evidences of prosperity as the other great lines of communication throughout the country.

The tolls of Canal, of Indiana, for the month of August, were.....\$21,023 48
The tolls for August, 1849..... 8,777 55

Increase.....\$12,245 43
The tolls to 1st Sept. 1848 were.....\$85,437 60
" " 1st Sept. 1849 were..... 97,090 48
" " 1st Sept. 1850 were..... 106,514 95

We have received the following important information in regard to this work:—

The Trustees, on the 6th instant, closed a contract for the completion of the Evansville division of the canal, at fair prices, with Samuel Forrer, Solomon Sturges, and S. R. Hosmer, of Ohio.—The work is to be commenced within thirty days, and finished by the 1st day of November, 1852.—This division, from Petersburg to Evansville, on the Ohio river, (54 miles in length) embraces 35 miles of heavy and expensive excavations and embankments. The line to Petersburg was put under contract some time since, and the work is in a forward state. The Evansville division was the last to finish the entire canal to the Ohio river.—The contractors agree to take the obligations of the Trustees, payable at such dates after the work is completed as will enable them to meet the payments out of the tolls of the canal and the sale of lands, without inconvenience. The high character of the contractors, and their abundant responsibility and great experience, place the completion of this work, according to the terms of the contract, beyond a question. Thus, we may look at an early day to the completion of this great canal, which traverses a region of country unsurpassed in fertility, by any other portion of the Mississippi valley. This contract is understood to be a highly advantageous one to the trust, and creditable to the energy and business tact of Messrs. Charles Butler, A. W. Puett, and Thomas Dowling, the Trustees. The canal is now finished and navigable from Lake Erie to Point Commerce, 42 miles south of Terre Haute.

Wilmington and Manchester Railroad.

For the purpose of showing the present condition of this road, we copy the following extract from a letter of Gen. Harlee, President of the above road, to a gentleman at Cheraw, S. C., which latter place it is proposed to connect with the above road by a branch.

MARION C. H., August 23, 1850.

JAMES POWELL, Esq.,

Dear Sir: As all contingency is now fairly at an end, as to the construction of our railroad to the Great Pee Dee, I would suggest that you would consult with the Commissioners at Cheraw, as to the propriety of moving in opening the books for the stock of the company to connect a road with your place.

We have under contract, with a few trifling exceptions, all the road from the Pee Dee to Manchester, including grading, timber, truss work, etc., and will commence laying the iron in January next at the western end. We have purchased 3000 tons as you are aware for the first 40 miles, and are now engaged in negotiations for the remainder to reach the Pee Dee river, which I think will be consummated in a few weeks, and hope to take the next crop from the Pee Dee country.

All of the grading in this State east of the Pee Dee is in progress, and a portion of the timber contracted for, and arrangements have been made to put the whole of the contracts not heretofore let for grading and timber in North Carolina, under way

by 1st October next, and all that we require is the means to purchase iron, etc., for that portion lying between the Great Pee Dee and Wilmington. For this we have no apprehension; with two-thirds of our capital paid in and expended, we can have no difficulty in negotiating our bonds for the rest on fair terms, even if North Carolina does nothing; but it is confidently relied upon, that her next legislature will either subscribe or guarantee for the company from \$200,000 to \$300,000.

I have now an offer of iron for half cash and half credit, for ten years, for our bonds alone at a fair price.

There can, therefore, be no uncertainty as to the ultimate completion of our road, or as to its business; and the question is, is it of sufficient importance to your people, to make an investment to the amount required to secure a road from Cheraw to join it. I need not, I am sure say anything to you on this point. My object is to point out the propriety of beginning at once, if you intend undertaking it. The times are now prosperous, and the road can be built by an appropriation of such a portion of the means of those interested, as will effect them. Thus far, our contractors have paid up and gone on with the work, without any diminution of their usual crops; and although \$100,000 worth of work or more has been completed, the loss of labor from other pursuits has not been felt, nor will that which is yet to be bestowed upon the work.

Pennsylvania.

The Union Canal.—During the year 1849, the total tonnage on the Union Canal amounted to 148,332 tons—of which the item of anthracite coal amounted to 75,527 tons. The report of the managers of the company gives a very flattering account of the condition of their affairs. The tolls received for the past season, amounted to \$86,799 89, the tonnage 148,332 tons. The transportation of coal from Pine Grove has increased, and was larger last year than in any former one. 78,209 tons were mined and transported over the railroad; 72,156 tons of this were shipped from Pine Grove, of which 28,111 tons passed out of the canal at Portsmouth; the remainder, 44,045 tons, having been consumed on the line of the canal, principally at Lebanon. The coal trade from this canal which passed out at Portsmouth has increased but 2590 tons the last year, that of the other Susquehanna regions has increased during the same time, 44,120 tons—the whole amount of it exceeding 300,000 tons. This trade is constantly on the advance, from the erection of new iron works on the Susquehanna below Portsmouth, and from a new outlet at Delaware city by way of the Tide Water and Chesapeake and Delaware Canals. Much of this trade could be secured for the canal, were the capacity sufficient for sixty to eighty ton boats.

The capital on the first of January, consisted of
1,517, old shares of \$200 each.... \$309,400 00
48,418 new shares of \$50 each..... 2,420,900 00
Fractions amounting to..... 14,628 25

Total.....\$2,744,928 15

The Pennsylvania Railroad.—Philadelphia and Pittsburgh.—From and after the 16th of this month the Pennsylvania railroad company will run their cars from Philadelphia to the intersection of their road with the Portage railroad. This makes a continuous line of railroad from Philadelphia to Johnstown, a distance of two hundred and eighty miles. From Johnstown to Pittsburgh, passengers can have the choice of canal boats or stage coaches, as may suit their taste or convenience. The time to Philadelphia will be about thirty-three hours, by taking the stage to Johnstown, and about forty hours by taking the canal. These facilities must greatly increase the travel through Pittsburgh this fall and winter.—*Pittsburgh Gaz.*

Canada.

The people of Quebec are moving in the construction of a line of railroad to intersect the St. Lawrence at Richmond. A large meeting was recently held in that city, composed of its richest and most influential citizens, at which, among others, the following resolutions were passed:

Resolved, That in the opinion of this meeting, it is absolutely necessary (to avoid remaining in an isolated position, and as it were excluded from all participation in the trade and prosperity of the other portions of North America,) forthwith to obtain a safe and rapid means of communication, at all seasons of the year, with the seaboard, and for the purpose of attaining this end, to direct all our efforts and energy, and all our resources, immediately to commence constructing the contemplated railroad from Quebec to Richmond, there to connect with the Atlantic and the St. Lawrence railway.

That it is the duty of the corporation of the city of Quebec, in accordance with the example of the provincial government, and of the cities of Montreal, Toronto and Hamilton, to aid the construction of a work from which the city will derive so much benefit, by issuing debentures to the same amount and on the same conditions as those issued by the corporation of Montreal in aid of the St. Lawrence and Atlantic railroad; and that it is the decided opinion of this meeting that upon this aid depends the success of the enterprise.

The meeting was presided over by the Mayor, and was addressed by the Hon. Mr. Caron, Mr. Chanveau, Mr. J. B. Forsyth, Mr. Lloyd, Mr. Chabot, Mr. Cauchon, Mr. D. Ross, Mr. Lemieux, Mr. Macdonald, Dr. Painchaud, Mr. Rheame, Mr. Angers and Hon. W. Walther. We should judge from the tenor of the speeches, that feeling in favor of this project was very strong. From its importance to Quebec, from the connection it will open with the lower British provinces, the ease with which the road can be built, and the shortness of the line, we entertain no doubt of its construction.

Champlain and St. Lawrence Railroad.—We learn that the Champlain and St. Lawrence railroad have given out the contract for the extension of their line. The contractor is to be paid 502 shares, of £50 each, being £25,100, and the balance, £46,000, he will receive in the shape of bonds, payable in 1860. The company pay for the lands, which it is estimated will cost £5,000.

Illinois.

Central Railroad.—William S. Waite, Esq., President of the Illinois section of the Central Railroad, from Terre Haute to St. Louis, recently visited our city, on business connected with the organization of the corps of engineers, and the location of the road. While here, we understand, he examined our roads being constructed, and was highly pleased with the system of connection by the union track, of the different lines, as well as with the permanent manner of the construction of our heavy iron roads. He speaks with entire confidence of the construction of the road through Illinois, at an early day. He says the people on the route, as well as the citizens of St. Louis, are alive to the importance of the work. The engineers, we learn, are now actively engaged in the field locating the road. With the construction of this road, the Terre Haute road, and the Bellefontaine road, we will have a direct and continuous line through Illinois and Indiana, to the Ohio line, there to intersect the Pittsburgh, Cleveland, Sandusky, Columbus, and Dayton lines. When this great central line shall be completed as it most certainly will be in a few years, the greatest facilities will be afforded to the traveller, as well as to those transporting merchandise and produce between the east and west.—*Ind. State Sentinel.*

Indiana.

Lawrenceburgh and Upper Mississippi Railroad Company.—The following persons have been chosen directors of this road for the present year:—George H. Dunn, Walter Hayee, David Nevitt, James B. Toley, James Hamilton, Edward Marshall, A. R. Forsythe, Joseph Winterode, and T. Summan.

A statement of the condition of the company shows that at the date of the last report made in March, that stock stood at \$283,000.

Added since:—

City of Lawrenceburgh subscription.....	\$15,000
Real estate subscription.....	37,363
Stock to be taken in new contracts.....	7,000
Cash stock.....	11,500
	70,863
Stock applicable to the Shelbyville branch.....	25,000
Stock payable in lumber.....	6,000
	\$384,863

In March last there were under contract, 20 miles. Since let out.....14

Total under contract now.....34
Estimated cost of grading.....\$133,000
Amount of work now paid for.....50,000

Twenty-two miles will be ready to receive the superstructure and the residue to Greensburg by the fall following, and probably some portions of all the branches to Columbus and Shelbyville.

Ohio.

Belpre and Cincinnati Railroad.—The directors of this railroad company were in session at Frankfort yesterday. We understand that the connection with the Cincinnati and Hillsborough road, at the latter place, were agreed upon, under certain conditions to be complied with by the latter. An engineer has been employed, and will be in the field by the 1st of October; and before spring, it is supposed, a portion of the road between this city and Hillsborough will be placed under contract.—*Chillicothe Metropolis.*

Ohio.

Cleveland, Norwalk and Toledo Railroad.—The friends of this important line, which is designed to connect the railroads of Ohio with the Michigan Southern at Toledo, are making good progress in providing the means for its construction. The line leaves the Cleveland and Columbus railroad at Wellington, in Loraine county, and will run thro' Norwalk, Bellevue, Fremont, and probably thro' Perrysburgh and Monroe city, to Toledo. In Huron county \$100,000 has been subscribed to this work. This sum will probably be raised to \$120,000. In addition to this, the county is expected to subscribe \$100,000 more. Sandusky county is also expected to subscribe as much more, and furnish an additional individual subscription of \$25,000. Perrysburgh and Maumee will subscribe \$100,000, should the road pass through these towns, as it probably will. Toledo will probably subscribe \$50,000 in her corporate capacity in addition to those made by individuals. The route is well adapted for a railroad, and is far enough from the lake shore to avoid the deep ravines and water courses which intersect the country on the lake shore. With the above, the construction of every link in the great chain of railroads from the Atlantic to the Mississippi is secured, and the whole line will probably be completed in about two years. It is fortunate that it is in the hands of numerous companies, each of which is busily engaged upon its appropriate section. This brings to the whole line not only a much larger amount of means, but also a much larger aggregate of business and engineering

skill and ability than if it were under one head.—All engaged upon the several divisions of this road are as much interested in the success of each, as if they were part owners of the whole line.

Georgia.

The business of the Western and Atlantic railroad has increased very largely this year. The passage receipts of July were one hundred per cent larger than last year, and the freight gains were very large. The receipts of the six months ending the 30th of June, were:

	1849.	1850.
Freight.....	\$48,690	\$66,119
Passengers.....	16,275	29,852
Total.....	\$64,955	\$95,971

Increase in 1850.....\$31,016

The receipts of the Central railroad show likewise a large gain over July, 1849. The earnings are \$22,525 against \$33,160, an increase of \$10,634, or nearly 50 per cent.

The profits of the Central railroad for July, 1850, over those of July, 1849, were \$10,634 93.

The following is a comparative statement of the earnings of the Georgia railroad, in the month of August, 1849 and 1850:

	Passengers.	Freights.	Mails.
1850.....	\$29,779 10	\$10,595 46	\$17,371 47
1849.....	20,398 00	19,405 31	39,793 40
Increase.	\$7,420 92	\$187 15	\$7,608 07

Maryland.

The revenue for the month of August on the Baltimore and Ohio railroad has been as follows:

	Passengers.	Freight.
Main Stem.....	\$31,773 82	\$73,550 29
Washington Branch...	23,256 86	3,673 61
	\$55,030 68	\$77,224 90

Making an aggregate of \$105,324 11 on the Main Stem, and \$26,931 47 on the Washington Branch—the total being \$132,225 58.

The above shows an increase over the corresponding month of last year of \$12,705 59, being \$5,665 61 on the Main Stem, and \$7,042 78 on the Washington Branch.

Bridge at Rouse's Point.

The Traveller learns "that the committee of the New York Legislature, who have recently been making an examination of the premises, with a view to the question of building a bridge at Rouse's Point for the accommodation of the Vermont and Canada and Ogdensburg railroads, have come to a decision adverse to building the bridge." We do not understand that such a decision, if carried out, will prevent the road from crossing Lake Champlain, though it may cause an addition of two miles to the track.

Pennsylvania.

An unusually large meeting of citizens of Lehigh county, favorable to the construction of a railway from the Schuylkill and Lehigh coal regions to intersect the Somerville and New York railroad at Easton, was held at Allentown on Tuesday, the 3d inst. Hon. James M. Porter, President of the Delaware, Lehigh, Schuylkill and Susquehanna railway company, was called upon to address the meeting, and in the course of his remarks, briefly stated, that the books soliciting subscriptions of stock to the above road were opened at Allentown and Easton, but met with exceedingly poor encouragement, although much was said and done in support of the measure—only a few shares were subscribed in Lehigh and Northampton counties.—

Stock to the amount of \$500,000 was subscribed by several gentlemen in New York and Boston. The probable cost of the road was not more than common, ranging from 23 to 25,000 dollars a mile. The estimate from Tamaqua to Easton being \$1,500,000.

The Railway in Nova Scotia.

The Nova Scotian says that the proposed line to Portland is the engrossing topic of conversation, and the spirits of the people have already risen to a pitch commensurate with the importance of what they know and feel will prove the salvation of the Provinces.

The government of Nova Scotia has forwarded an application to the home government, asking whether, in the event of that Province pledging itself for the necessary sum to construct the railway to the borders of New Brunswick, the imperial government will endorse the credit of Nova Scotia. The Nova Scotian remarks, that there never was a document transmitted across the Atlantic which more deeply concerns the people of those provinces than the one in question.

Michigan.

Central Railroad.—For the last few days, says the Detroit Tribune of 9th inst., there has been a perfect jam of car loads of passengers going both east and west, over the Michigan Central railroad. We learn at the office of the company, that six thousand passengers were conveyed over the road during the last week. The Central road has become indeed the main artery of travel between the east and the west, and deservedly so. Over four thousand barrels of flour are brought in daily on the freight trains.

Indiana.

Lafayette and Indianapolis Railroad.—The grading of the whole line of this road is now under contract, and the directors will soon be in the market for the iron and equipment.

This road is virtually a continuation of the Madison and Indianapolis in direction of Lake Erie. Lafayette is one of the most flourishing towns in the State, and is the commercial centre of northeastern part of Indiana. The above road will open a direct communication with the Ohio river, and with Cincinnati, and open the interior of Indiana to the Erie and Wabash Canal on one side and the Ohio on the other. The line of the road traverses a very fertile portion of the State, and from its direction and connections it must always be an important *through* line. We learn that the company will probably soon be in possession of sufficient means to complete their whole road, and that it will be urged forward with all practicable dispatch.

Missouri.

The Pacific Railway.

We give this week a communication in relation to this road from a gentleman well qualified to speak in the premises. This work is now destined to occupy a very prominent position before the public, not only as a magnificent State project, but as a part of the great line to California. It is marvellous to see how rapidly this and kindred works in the west have risen in public estimation. The *Pacific Railroad* will soon become as familiar to the business men of New York as the Erie.

We can see no good reason why this road should not be built with all the dispatch compatible with a work of such magnitude. With the large amount of means which will be furnished by the people of Missouri, we think that there will be no difficulty

in obtaining from the east (if it should be needed) such balance as may be wanted to complete it.—There is no good reason why the railroad from St. Louis to the Kansas should not be completed as soon as the great lines now in progress from the east, shall reach that city.

North Carolina.

The receipts of the Wilmington and Raleigh railroad company for ten months, from October, 1849, to August, 1850, show an increase over the same months of the previous year, of \$74,040 15—making a monthly increase of \$7,404 40. Notwithstanding this increase may be attributed in part to cholera at the west, and there being but one steamer between New York and Charleston for some months, the Wilmington Journal is clearly of the opinion that were the Manchester road now completed, the receipts for the next ten months would be more than double what they have been during the above time.

Memorial of the New England Iron Manufacturers.

We have before us this document, presenting to Congress the condition of this branch of industry in New England. The general depressed state of the iron manufacture there is well known, and under the present rate of duties it is certain that most of the furnaces must soon go out of blast. For the better kinds of iron a few may be kept in blast, but the great majority of them must be abandoned.

The cost of making iron at a furnace on Lake Champlain is stated as follows:

Quantity of iron made from October 1st, 1847, to October 1st, 1848, 3,017 gross tons.

Amount of Stock Used.

603,400 bushels of charcoal, at 6½ cts. per bushel.....	39,220 00
6,034 tons of ore, at \$1 per ton.....	6,034 00
200 tons of clay, at \$2 per ton.....	400 00
800 tons of limestone, at \$1 per ton.....	800 00
200 tons of pigbed sand at 50 cents.....	100 00

\$46,554 00

Cost of the above stock per ton of iron....	\$15 43
Labor in manufacturing pig iron.....	3 00
Repairs of furnace.....	1 00
Agent, bookkeepers, managers, etc.....	1 18
Insurance and taxes.....	25
Transport to market.....	3 25
Interest on \$50,000 fixed capital, at 10 per cent.....	1 67
Wharfage, weighing, etc.....	50
Interest for one year on \$26 28, the sum the above items, being the cost of the iron in market, including six months' time given to purchasers.....	1 84
Commissions on sales.....	1 40

Cost of iron per ton.....\$29 52

The highest price offered at market is \$22 50! The furnace has 3,000 tons on hand. If the iron were sold at present prices, there would be a loss to the manufacturer of \$21,000

COST OF MAKING "SALISBURY" IRON AT CORNWALL, CONNECTICUT, IN THE VALLEY OF THE HOUSATONIC.

Amount of fixed capital, \$10,000.

Quantity of iron made in a year, the average time in blast being ten months, 1,200 gross tons.

Items of Cost of One Ton of Iron.

225 bushels of charcoal, at \$7 per 100 bush.....	\$15 75
3 tons of ore, at \$4 25.....	12 75
½ ton of limestone, at \$1 50.....	50
Labor.....	3 00
General expenses, repairs, etc., estimated at.....	1 00
Interest on fixed capital.....	50
Interest on cost of iron, including 6 months' time to purchasers.....	99

\$34 49

Allowing that the above figures are correct, then the conclusion is a necessary consequence. That they are in the main, the condition of the iron manufacture in all parts of the country fully proves. The estimated amount produced in 1848 was about 800,000 tons. The consumption the same year being about 1,000,000. The consumption still increases in a much greater ratio than our population. The amount produced in 1850 is estimated at 400,000! What stronger proof of our inability to compete with the foreign maker.

The memorial is an interesting document, and argues the necessity of further protection in a very able manner. But as the arguments are of necessity similar in kind to those put forth by the iron makers of other parts of the country, we do not think it necessary to give them here at length. That experience is necessary, both as regards cheapness and quality of production, no one will deny: Till we acquire the same experience that our foreign rivals possess, we certainly cannot compete with them. We certainly cannot gain this experience unless we can continue to manufacture, with profit, for iron makers will not continue to follow a losing business for the benefit of the rest of the community. Such protection as will enable us to manufacture with profit, is absolutely indispensable to enable us in the end to compete with the foreigner.

It is a great misfortune that the effects resulting from protection are so little understood. With the great mass, protection means favoritism of a particular class. Let us look at this. Suppose that the importation of foreign iron should be prohibited, what would be the result? The price of iron would immediately rise, as the ordinary supply was cut off, and the manufacturer would realize a large profit. This profit would induce all those in the manufacture to enlarge their works, to the full extent of their ability, and would lead others to engage in the business from the expectation of a larger profit than their present business yielded. The result would be, that from this expectation, the business would be overdone, the price of iron would fall in consequence, and those who engaged in the manufacture of iron from the idea of large gains, would be compelled to relinquish it, from its very unproductiveness. This evil in the end would correct itself. Only so much capital would continue to be employed, so the manufacture of iron could be as profitably employed here as in other pursuits, and no more. If iron should continue to bring \$100 per ton, the manufacturer would be no better off than the farmer or the cotton spinner. Domestic competition would bring down the profits to a living business, just as we find it to be the case in farming or in any branch of industry. If this high price should be maintained, it would only prove the want of adaptiveness of our country for the iron manufacture, but nothing as to the profits of the maker. In this country there are no checks upon the free investment of capital. It seeks the most profitable direction with the same certainty that water finds a level. When iron making yields a greater profit than farming, a portion of the farmers quit their pursuits and engage in the iron manufacture. This has been exactly what we have witnessed among ourselves within a very short time. Under a high duty, persons from every class and pursuit in the community were led to engage in iron making. Under the present depressed condition of this interest, these persons are again returning to their former pursuits. If a particular class of persons enjoyed a monopoly of the manufacture, then protection would be for the ben-

efit of this class. But every man in the United States may if he chooses engage in the iron manufacture, and there is ore and coal enough in many of the States to make an amount of iron sufficient, not only for our own use, but of the whole world. In what does protection create monopoly? It may increase the price, and enable the manufacturer to continue to produce it, but it places him in no better position than any of his neighbors.

Protection, therefore, is not monopoly. Now we hold that it is for the interest of a country to encourage the production of such articles to which she is best adapted. Such encouragement adds just so much to her strength. It is for the interest of a Frenchman that the production of wine should be encouraged; for the Englishman, iron; for the Cuban, sugar; because their respective countries are peculiarly adapted to the production of these various articles. By such encouragement all these nations become experts in their appropriate calling. Now, there is nothing to which we are better adapted to produce than iron. We have the best ores in the world, vastly superior to the English, and we have an abundance of every kind of fuel. In natural capacities for iron manufacture, we are as much before the old world as we are in our agriculture. The only reason why we cannot manufacture as cheaply is our want of experience and capital, and the high price of labor. We can acquire experience only from practice. Protection, by securing us against the foreign manufacturer, supplies the place of capital, and enables the manufacturer to pay the same price to his labor as the farmer or persons engaged in other pursuits. Experience and cheapness always go together, as domestic competition will always keep the profits of the manufacturer to a reasonable limit.

This we believe to be a correct view of the doctrine of protection. The prejudice against it as creating a monopoly is without the least foundation, and our first efforts should be to disabuse the public mind of the erroneous views which prevail.

One great argument in favor of protection is the financial question involved in it. A nation may buy beyond its means as well as the individual, and similar results follow both cases. The individual who buys beyond his means of payment, loses the control of his business, becomes embarrassed and fails. The nation is made up of the aggregate of individuals, and the experience of the individual becomes the experience of the masses. If we import more than we export, the balance must be paid in the precious metals, the loss of which, from the part they perform in the machinery of business, is sure to bring with it distress and ruin. Our commercial history is full of illustrations of this truth. The revolutions which followed vast importations of 1836-7 afford a striking example.

Why can we not manufacture as cheap as the Englishman? For the want of capital and experience, united with the high price of labor. In all other respects we are as well off. Protection will give us experience and capital. We hope never to see labor with us so ill paid as in the old countries. How much are we paying for want of this experience and capital? The railroad companies of Michigan and Illinois are paying from \$45 to \$50 per ton for iron that costs in Wales \$24 per ton. One-half of all they pay is eaten up in transportation and charges! Now there is no reason why we cannot in time manufacture the article at an advance of 50 per cent. over the Englishman. All we want is practice. The most direct way to

reduce the price is to protect our own workmen till they acquire sufficient strength to stand alone. Protection has already enabled us to manufacture some articles of first importance, nails, for instance, at a price that would defy foreign competition, without duty. So with coarse cottons. What should we now be paying for these if they had never been protected?

Still, notwithstanding all this, we do not believe that the depressed state of the iron manufacture in New England and New York is owing entirely to the want of protection. It is owing chiefly to the weakness of position. At the present day iron cannot be manufactured with profit, where the fuel costs at the rate of \$15 per ton. This one item costs more than the whole cost of English pig, and is nearly up to the cost of the make of some Pennsylvania furnaces, favorably situated. The New England manufacturers must go where fuel is cheaper. No tariff would save a great majority of the furnaces there. Domestic competition would destroy them; and if those now engaged in this business would hope to succeed, they must change the theatre of their operations to parts of the country where ore and coal are found side by side, and within convenient distance of navigable waters.

AMERICAN RAILROAD JOURNAL.

Saturday, September 21, 1850.

The completion of some of the great leading lines of railroad now in progress in various parts of the country is not only important for the convenience of travel and business, but from the influence which they will exert in securing the construction of the new lines which they will call into existence. The energies and capital of the country are now diverted to, and absorbed by, the great projects, which are designed to connect the extremes of our Union. With the exception of Boston, which may be said to have completed her system of railroads, all the principal Atlantic cities are still occupied with their unfinished projects. New York, Philadelphia and Baltimore are now engaged in pushing their appropriate lines which are to connect them with the West. When we go into the interior, we find the people of Ohio, Indiana, Illinois and Missouri tasking their energies to carry these lines to the western borders of our uninhabited territory. In the South, the Mobile and Ohio, the Alabama and Tennessee, the Memphis and Charleston, the Nashville and Chattanooga, the Virginia and Tennessee, and the roads through East Tennessee, engross almost the whole attention of people in that quarter; so that every part of the country is occupied by some magnificent project, which is to constitute the whole, or a part, of some grand trunk line which is to connect its most remote points.

These great lines are to constitute the *woof* of the great railroad web which is fast spreading over the whole country. The *filling* will be put in as soon as the first part of the process is completed. The completion of these works will relieve the attention of our people from the projects which now occupy it, and direct it, with our vastly accumulated capital, toward new schemes of less magnitude, but of no less local importance, till every section of the country capable of sustaining one, is penetrated by a railroad.

The two great lines of railroad running through New York, the Erie, and what is termed the Central, afford a good illustration of what we have stated. These run nearly parallel to each other,

for a distance of some 300 miles. For nearly the whole of this distance, the territory embraced between the two, will be intersected by cross roads, with but a small interval between them. Two are already in operation, some are in progress, and others are projected and will soon be commenced; and their construction will go on till every farmer shall enjoy within convenient distance this means of locomotion. What is true of the above roads, is equally so of other lines in other parts of the country.

Continuous lines of railroad from the Atlantic to the Mississippi are now regarded as of the first importance. New York in the summer season enjoys the advantage of a speedy and easy communication with the western shore of Lake Michigan. The advantage of this to New York can hardly be estimated. In the winter this communication is completely interrupted, and during this period the West is without any means of receiving from, or forwarding merchandise to, its best markets. In that part of the year best adapted to the transportation of its products, it is entirely without the means of doing it. The loss consequent upon this is beyond estimate.

A few years will remedy this great inconvenience. The internal commerce of the country will be carried on without interruption, and through channels the best adapted to its transit. The advantage from this will be much greater than the mere saving in expense of transportation. Every farmer and planter can hold his own produce to meet the demand. He is now compelled to forward when the rivers are navigable. The whole mass is thus thrown upon the market at the same time. The natural tendency of this is to diminish the demand, consequently the price. If the producer wishes to hold on for a rise, he is subjected to heavy expense at a distant post. With a railroad, he stores his own crop, and forwards it to market only when he can realise a fair price. The convenience of a railroad to the country merchant is equally great. When his means of communication are open only one half the year, he must lay in a sufficient stock for the balance. This involves the necessity of having a much larger capital than if he could supply all his wants at will.

The completion of the few great lines we have enumerated, will constitute an era in our material and physical progress, and will accomplish for the country at large, what the Erie canal effected for New York. In a commercial point of view it will double our present dimensions, and will give a renewed impulse to our population, such as we have witnessed in parts of New England where railroads have been longest built.

Maine.

Androscoggin Railroad.—We are happy to learn that the directors of the Androscoggin railroad have succeeded in effecting a loan of \$100,000, in anticipation of assessments, on very favorable terms. This will enable them to finish the building of their road, and put it in full operation to Livermore Falls, near Jay line, or within about fourteen miles of Farmington, the shire town in Franklin county.

Kentucky.

We learn from the Louisville Courier that the Louisville and Frankfort railroad will be completed to within about fifteen miles of Frankfort by Christmas. The rails are now placed on the road several miles this side of Lagrange, and are being laid at the rate of about a mile per week.

Missouri.

The Committee on Public Lands have reported to the House of Representatives in favor of a grant of land in aid of the *Pacific* railroad from St. Louis to the west line of Missouri. From the action of Congress in relation to the Mobile and Chicago railroad, we expect favorable action upon the report.

Ohio.

Hamilton, Eaton and Richmond Railroad.—We learn, from the most reliable authority, that the work on the Hamilton, Eaton and Richmond railway, progresses well. The contractors have a large force on the road, and intend, in a short time, to increase it largely. They have secured the connection with Richmond, and are getting new subscriptions to stock. A little aid in this city will infuse more energy into this company, and enable them, in connection with those west to Indianapolis, in a few months to open a railroad communication with that city, and the whole northwest.—*Cincinnati Gazette*.

Mobile and Ohio and Illinois Central Railroad.

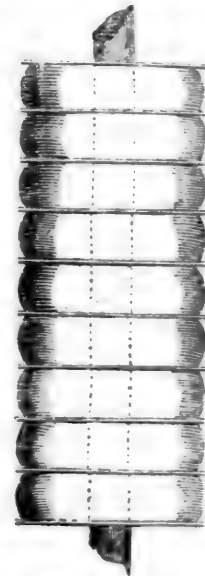
We are gratified to see that this bill, granting lands in aid of these important roads has passed Congress, and become a law. It grants alternate sections of land for the whole length of the two roads, (which is not far from 1,000 miles) provided they can be found within 15 miles of the line of the road.

This bill secures the early construction of a railroad from Lake Michigan to the Gulf of Mexico, in an almost straight line. It opens to the great lakes the shortest possible communication with the gulf, and brings the products of the tropics and of high northern latitudes within close proximity. Its line is identical with that of the direction of trade and must ever constitute one of its great channels between the extremes of the Union.

Without this grant these roads could not have been built for many years. With it their early construction is certain. They will traverse sections of the country far removed from navigable waters, which, for the want of suitable means of transportation, have attracted but little attention, and which are but thinly peopled, though of great fertility. These roads will put a new face upon the conditions of things at the south, and impart to that section the stimulant which the steam engine always administers to a people among whom it is introduced. They will give a new importance to Mobile as a seaport and make it one of the leading commercial towns of the south. The country will reap a much greater benefit from these roads than the value of the grant which has secured their construction. This great line of railroad will give to Cairo the importance of position which has been claimed for it by those who have been endeavoring to build up a city at the confluence of the Ohio and Mississippi. It will make it the entrepot of trade for Southern Illinois, and the shipping port in the winter for the produce of that great State.—It will be the point where the travel will leave the Mississippi for the land route north. From the junction of the Ohio the Mississippi is always navigable for the largest class boats. For a greater part of the year Cairo can be reached by railroad much cheaper than by steamboat. Below that point the river will always offer the cheapest carriage. This will constitute that place the shipping point of an immense amount of produce. Its proximity to the coal fields of Illinois is another fact in its favor. As we said before, the completion of the above

roads is all that is wanted to make it what its friends claim it is capable of becoming, the commercial capital of Illinois.

Important to Railroad Co's and Car Builders.



THE question which for a long time has been pending before the Commissioner of Patents, involving the Validity of the Patent claimed by F. M. Ray, of this city, and W. C. Fuller, of England, for the use of India rubber for Railroad Car Springs in the 'Disc' form, has been decided in favor of Mr. Ray, the American Inventor. This decision gives to Mr. Ray and his associates the sole right to manufacture and sell the India rubber Car Springs in all the varieties in use. Railroad Companies and Car Builders will please take notice of this fact. All purchases that have been made of any other persons, than said Ray and his associates, since the filing of his application, have been infringements of his patent, as well as all that may be made for the future.

To Contractors.

ALABAMA AND TENNESSEE RIVER R. R. SEALED Proposals will be received by the Directors of the Alabama and Tennessee River Railroad, at their office in Selma, until the 1st of November next, for the graduation, masonry and bridging of 56 miles of the Southern Division of said road, extending northwardly from Selma.

Plans and profiles may be inspected and specifications and information will be given at the office of the company in Selma, on and after the 15th of October next.

Twenty-six miles of this division were graded in 1839. This part of the division will require repairs to the road bed, and will be furnished anew with culverts and bridges.

The country embraced in this division is healthy, well watered, and possesses facilities for obtaining supplies of provisions.

Proposals may be based upon cash payments, or upon payments of a proportion, or of the whole of the work in stock.

The Directors reserve to themselves the right to accept or reject proposals as they may think proper for the interests of the company.

The Directors expect to have as much as twenty miles of the Northern Division, extending northwardly from the Coosa river in Shelby county, ready for examination by the 15th November, and for letting by the 1st December; and 30 miles more, ready for examination by the 1st and for letting by the 15th of January, 1851. It is likewise their intention to let out the grading, masonry and bridging of the remainder of the Southern Division and of the Northern Division terminating at Gadsden, with all possible despatch.

By order of the President and Directors,
LEWIS TROOST, Chief Engineer.
Selma, Ala., August 30, 1850.

Great American Engineering

AND MECHANICAL WORK, just published in medium folio One Dollar, 75 cts. to Subscribers. Part VII of "Specimens of the Stone, Iron & Wood Bridges, Viaducts, Tunnels, Culverts, &c., &c., of the United States Railroads." By George Duggan, Architect and Civil Engineer.

The present part contains beautifully executed plans, elevations, sections and details of the elegant timber Bridge, (Burr's Patent,) 150 feet span, across Salmon River, Malone, on the line of the Northern-Ogdensburg-railroad, and isometrical views of Bridges 30, 40, 60, 82 and 88 feet span on the line of the Utica and Syracuse railroad, with specifications, form of contract, &c., &c., for the Connecticut River railroad.

"It is a work that was a great desideratum, and must prove of great benefit to the engineering profession generally, and especially to the tyro in practical engineering and mechanical knowledge; in truth it strikes us, that it would require years of labor and patient toil on the part of a young engineer to prepare the drawings, and collect the information that will be embodied in this work, and can now be secured for the trifling sum of \$9"—[Scientific Amer. March 16, 1850.]

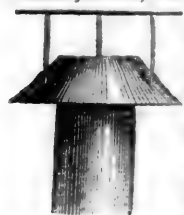
In connection with this subject (Iron Railroad Structures) we take occasion to call attention again to Mr. Duggan's valuable and expensive publication, exhibiting drawings, with full descriptions of the various stone, iron and wooden bridges, viaducts, tunnels, culverts, etc., of all the Railroads in the United States. Mr. Duggan is an accomplished Architect and Civil Engineer, who came from Ireland to this country to exercise his profession; but finding Railroad construction here, in many respects, different from that he had been accustomed to in Europe, he applied himself to the study of our system; and the fruits of his researches and investigations embodied in this work, are well calculated to meet the exigencies of engineers, and to assist draughtsmen, bridge builders, mechanics and students.—[N. Y. Jour. of Com., Feb. 14, 1850.]

Published by
GEORGE DUGGAN,
300 Broadway, New York.

To whom all communications should be addressed, and subscriptions forwarded.

Emerson's Patent Ventilator.

ADAPTED to Cars, Engine houses, Public Halls, Factories, Churches, School Houses, Dwellings, Chimney Flues, etc.



This Ventilator is stationary, and cannot get out of order. It is constructed in such conformity to cert. in ascertained laws of pneumatics, as to insure a constant draft outward, whatever may be the changing direction of the wind. The Massachusetts Mechanic Association have awarded a gold medal to the Inventor, and the Manufacturers have already disposed of over

3,000 of the article. Manufactured and sold by
CHILSON, ALLEN, WALKER & Co.,
351 Broadway, New York.

NOTICE

For Proposals for Railroad Iron, for the Alabama and Tennessee River Railroad.

TO BE MANUFACTURED FROM ALABAMA ORE.

THE Alabama and Tennessee River Railroad Co. invite proposals, until the 1st of January, 1851, for Iron Rails, to be made of Alabama Iron, for the Northern Division and part of the Southern Division of their road, embracing a distance of about 105 miles. The rails are to be of the H pattern, in lengths of 18 feet, and weighing 63 lbs. per lineal yard. They are to be delivered on the Coosa river, at a landing to be hereafter designated, between Kimulgee ferry and Fort Williams, commencing their delivery on the 1st of November, 1851, and continuing it at the rate of from 80 to 100 tons per week, until the whole quantity required (10,500 tons) shall have been delivered. They are to be inspected by Lewis Troost, Chief Engineer.

It is proper to state to iron masters and capitalists at a distance, that the country traversed by the Northern and part of the Southern divisions of the road abounds in excellent iron ore and bituminous coal, and possesses every advantage for the successful manufacture of iron, health, cheap labor and provisions.

Further information may be obtained by addressing the President of the Company at Selma, Ala.
By order of the Board of Directors.

J. W. LAPSLEY, President.

Great Work on Bridge Building, etc., etc.

JUST published in medium folio, One Dollar, 75 cts. to subscribers.

Part I. of a "THEORETICAL AND PRACTICAL TREATISE ON THE CONSTRUCTION OF BRIDGES IN STONE, IRON AND WOOD," By George Duggan, Architect and Civil Engineer.

The present part contains beautifully executed plans, elevations, sections, and centering, of the Bridge of St. Maixence, France, by M. Perronet, the eminent Architect and Engineer, and plans, elevations, sections, and details of the oblique Timber Bridge, 700 ft. long, constructed for a double track across the River Tyne, on the line of the Newcastle and Carlisle railroad, by John Blackmore, C. E., with an introductory article on the relative merits of the various materials employed in the construction of Bridges, as regards economy, strength and durability, and critical remarks on the various forms of bridges designed and constructed by the most eminent architects and engineers in Europe and America.

"PART VI. of Specimens of the Stone, Iron and Wood Bridges, etc., etc., of the United States Railroads," By George Duggan, Architect and Civil Engineer, contains specimens of the plates and letter press intended for the APPENDIX, being the commencement of a complete Treatise on the Theory and Practice of Bridge Building. This will be one of the most valuable works on the subject ever presented to the attention of engineers in this country—condensing the most important information on this branch of architecture contained in the writings of the most eminent scientific men in the French, German, Italian, and English languages, in the course of the last and present century. It will be illustrated by numerous accurate representations of bridges of the greatest celebrity in modern times. Elaborate articles will be given on the strength, property, and uses of the different materials employed, and on the most approved methods of constructing Coffin Dams, Foundations, Centering, etc., with descriptions and drawings of the various engines and Machines that were found most useful in constructing the works, and a selection of such specifications as may be of service to the practical bridge builder. The sixth number treats of the Application of Iron to Railroad Structures, and is illustrated by beautiful drawings of the Bridge across the Delaware at Saw Mill Rift on the Erie Railroad, and of the bridge over Fairfield street, on the Manchester and Birmingham Railroad. The great success of this work thus far is the best tribute to its scientific merit and its adaptation to the wants of the American engineer."—[New York Daily Tribune, June 23, 1850.]

Published by George Duggan, 300 Broadway, New York, to whom all communications should be addressed and subscriptions forwarded.

Parties remitting Mr. Duggan \$5. and the remainder \$4 when they have been supplied with the first six parts of the "Theoretical and Practical Treatise on Bridge Building, etc." shall receive it monthly as published. To those making Mr. Duggan a present remittance of \$9, the work will be forwarded post free to any part of the United States.

Rosendale Cement.

THE NEWARK AND ROSENDALE LIME AND CEMENT CO. are now manufacturing at their works in NEWARK, N. J., and Ulster county, N. Y., a very superior article of *Hydraulic Cement*—also Lime Calcine Plaster, etc. Contractors and dealers will find it to their advantage to call or make application before purchasing elsewhere. All communications addressed to the subscriber, at Newark, N. J., will be punctually attended to.

1y*15 **HENRY WILDE, Secretary.**

Notice to Contractors.

SEALED PROPOSALS will be received at the office of the James River and Kanawha Company in Richmond, until the 1st day of October next, for the construction of the Piers and Abutments of the Bridges across James River at New Canton, Hardwicksville and Bent Creek. This work will be paid for in cash. Besides the usual reservation of 20 per cent. on the monthly estimates, the contractor or contractors will be required to give ample security, satisfactory to the Board of Directors, for the completion of the work at the time and in the manner specified in the contracts.

Plans of the above works will be exhibited and specifications thereof delivered to the contractors: at the office of John County, the Assistant Engineer in charge of the same in Columbia.

WALTER GWYNN,
Chief Eng. J. R. & K. Co.

August 16, 1850.

GRAHAM'S COMPOSITION, to Remove and Prevent Incrustation (or Scale) in STEAM BOILERS.

THIS valuable composition having been fully and extensively tested, is now offered to the public, as a sure remedy and preventive for incrustations in steam boilers of all descriptions. By its use, all scale is entirely removed from the boilers of Ocean and River Steamers, Locomotive and Stationary Engines, in from 3 to 20 running days, according to the size of the boiler and thickness of the scale. In New Boilers, all incrustation is prevented at a trifling expense.

The preservation of the boiler, great economy of fuel and labor, safety, and increased speed, are among the advantages to be derived from the use of this composition.

Orders should state the quality of water used, viz: "Salt," "Fresh," or "Brackish."

For sale, with directions for use, by
W. H. NEWMAN,
75 Pearl street,
New York.

TESTIMONIALS.

New York, August 17, 1850.

We have used Graham's Composition in the boilers of the Steamship Southerner, during several voyages between this place and Charleston. The boilers were old and very foul with scale, a very large quantity of which was removed by the use of the composition, and no new scale was formed.

From our own experience and observation in the use of the article, we are fully satisfied that it will effectually remove the incrustation made by sea water, and also that it will effectually prevent its formation.

We are also satisfied that the use of it will be attended with a great saving of fuel, and that it has no injurious effect upon iron.

DAVID N. MAXON, Engineer,
BERRY, Master,
Steamship Southerner.

Steamship Philadelphia, }
New York, August 27, 1850. }

I have used "Graham's Composition for Steam Boilers," in the boilers of Steamship Philadelphia, on the voyage to and from Chagres, and am entirely satisfied that it will remove, dissolve and prevent all scale or incrustation in salt water boilers.

For the preservation of the boiler and economy of fuel and labor, I hereby recommend the employment of this composition in the Boilers of Ocean Steamers.

WM. BISBY,
Chief Engineer.

Novelty Iron Works, }
New York, July 5, 1850. }

We have examined the specimen of Graham's Composition for preventing incrustation of steam boilers, and we believe it may be used with perfect safety in reasonable quantities for the purpose intended, as there does not appear to be any agent in the composition calculated to injure the iron.

STILLMAN, ALLEN & CO.

Piermont, May 20, 1850.

I have used "Graham's Composition," and find it to produce the intended effect; and I hereby, without hesitation, recommend it for Stationary, Marine and Locomotive Engine Boilers.

JOHN BRANDT,
Superintendent Motive Power
New York & Erie R.R.

New York, July 25, 1850.

In answer to many inquiries as to the practical effect of "Graham's Composition," I will state that I have used it in the boiler of the Steamboat Sunwick, which had become considerably incrustated with hard scale from both salt and fresh water. We used 10 lbs. per day, for three days, without blowing off the water, until the fifth day, when all was drawn off. To our astonishment, we found the whole interior of the boiler as clear of scale and smooth as when it came from the hands of the maker. The following week, we tried the same quantity in a small steam tow boat.—The boiler had old scale of long accumulation and very thick. We ran the boat three days without blowing off, and on the fourth day washed out the boiler and found it, like the "Sunwick's," perfectly clean and smooth as when new. I am therefore enabled to state that the use of the composition in these two instances under my own immediate observation and direction, has been attended with complete success.

JAMES MORROW,
Engineer Astoria Ferry.

Faggotted Car and Engine Axles

FORGED by RANSTEAD, DEARBORN & Co., Boston, Mass.
These Axles enjoy the highest reputation for excellence, and are all warranted.

Ogden & Martin's ROSENDALE CEMENT.

WE are prepared to enter into arrangements for supplying our Cement for public works or other purposes. We warrant the cement equal in every respect to any manufactured in this country. It attains a great degree of hardness, sets immediately under water, and is a superior article for masonry coming in contact with water, or requiring great strength.

For sale in tight barrels, well papered, at their office by **OGDEN & MARTIN, 104 Wall st.**
February 16, 1850.

The above cement is used in most of the fortifications building by government.

Railroad and Mathematical Instruments.

KUNS & BASELER, Mathematical Instrument makers, manufacture and keep for sale all kinds of mathematical instruments: also drawing instruments, scales and balances for the use of chemists, professional gentlemen, jewellers, etc., etc., of the most perfect description, at the lowest price, at 81 Nassau street, New York.

Ibbotson, Brothers & Co's CELEBRATED CAST STEEL

AND
Best Cast Steel Royal Improved Files, well known as better adapted for Engineers' and Machinists' purposes than any now in use in the United States.

Every description of Square, Octagon, Flat and Round Cast Steel, Sheet, Shovel and Railway Spring Steel, etc., and Steel to order for any purposes—manufactured at their works in Sheffield—and universally known by the old stamp "Globe."

HENRY I. IBBOTSON, Agent,
218 Pearl st., New York.

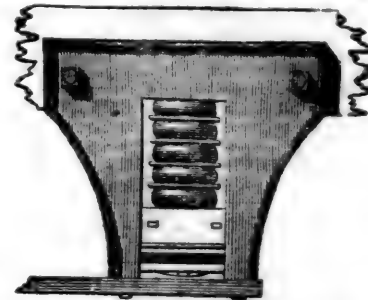
Railroad Iron.

OF ANY PATTERN AND WEIGHT,
Of a Favorite Brand,
And deliverable in Bond, or Duty paid, at any Port of the U. S., contracted for on favorable terms, by **CHARLES ILLIUS,**
20 Beaver St., New York.

Pig and other Iron also contracted for. Sole Agent for "*Baxter's Machine and Burning Oil*"—particularly adapted for "*Railroads*" and other Machinery—Preferred to *Sperm* by the many now using it, and 25 per cent. cheaper.

Coal.

CUMBERLAND SEMI-BITUMINOUS COAL
superior quality for Locomotives, for sale by **H. B. TEBBETTS,**
No. 40 Wall St., New York.
May 12, 1849. lm19

FULLER'S PATENT INDIA RUBBER SPRING.

THESE SPRINGS ARE THE CHEAPEST, the lightest and most durable of any yet known. They are easily applied to new or old cars, and there is small possibility of any accident occurring to them. Other parties through Mr. Ray set up claims to an India Rubber Spring which, though the same in principle, is very inferior in its working and durability. Actions are in progress for an Infringement on Fuller's Patent against parties using that Spring.

The superiority of Fuller's Spring over that claimed by Mr. Ray is fully established and has frequently been testified to. The following are from gentlemen who have had much experience with both Springs.

"It will afford me pleasure to recommend your springs to the companies in this region, in preference to Ray's which I am confident are inferior in mechanical arrangement to yours."
JOHN M'RAE,
Engineer S. Carolina R. R., Charleston.

"I do not hesitate to allow you to say that I concur in Mr. M' Rae's opinion that Ray's springs are inferior in mechanical arrangement to Fuller's. I repeatedly expressed that opinion long before Mr. M' Rae had seen your springs (as I believe) and entertain it still."
WM. PARKER,
Gen'l Supt. of Baltimore and Ohio R. R.

Office of Sup't Norwich & Worcester R.R. Co. }
December 26, 1849. }

"I most fully concur in the opinion of Jno. M' Rae, Engineer of S. Carolina Railroad, that 'Rays Springs are inferior to Fuller's Springs;' and shall with pleasure recommend them to all Railroad Companies for adoption. I have used both springs on this road and have no hesitation in saying that I should in all cases prefer Fuller's Spring."

SAM'L H. P. LEE, JR.,
Supt and Engineer.

Office B. & P. R. R. Co., }
Boston, 20th December, 1849. }

"This company have cars fitted up with both Ray's and Fuller's 'Metallic India Rubber Springs,' and do not hesitate to say that Fuller's arrangement very much superior to Ray's."

W. RAYMOND LEE, Supt.

The following result has been obtained by experiment upon one railroad.

A set of Trucks fitted with Steel Springs cost \$190.77 and weigh 2355 lbs. The same with Fuller's Springs, 131.71 " 1911 lbs.

Difference, \$59.06 " 444 lbs.

Not only is there an advantage in the cost, but owing to the great reduction in weight, the car can be made lighter throughout, and so an enormous saving in weight may be effected in a Train.

AGENTS.

G. M. KNEVITT, 33 Broadway, N. Y.,
JOHN THORNLEY, 110 Chestnut St., Philad.
THE BOSTON BELTING CO., Milkst., Boston.
January 2, 1850.

American Cast Steel.

THE ADIRONDAC STEEL MANUFACTURING CO. is now producing, from American iron, at their works at Jersey City, N.J., Cast Steel of extraordinary quality, and is prepared to supply orders for the same at prices below that of the imported article of like quality. Consumers will find it to their interest to give this a trial. Orders for all sizes of hammered cast steel, directed above, will meet with prompt attention.
May 28, 1849.

**To Merchants, Railroad Companies, Machinists and Boiler Makers.**

THE subscribers beg leave to call attention to their very large stock of *Iron and Steel*—of American, English, Swede and Norway make—of all the different kinds in use. Also, Railroad Iron, Ship, Boat and Railroad Spikes. They are also Agents for the *Best Pennsylvania Locomotive Boiler and Tank Iron*, each sheet of which will be stamped and warranted, at lowest mill prices. Our prices for all kinds of iron will be found very low, either for cash or approved credit.
BRINK & DURBIN, Philadelphia.

ENGINEERS.

- Atkinson, T. C.,**
Alexandria and Orange Railroad, Alexandria, Va.
- Baneks, C. W.,**
Civil Engineer, Vicksburg, Miss.
- Buckland, George,**
Troy and Greenbush Railroad.
- Clement, Wm. H.,**
Little Miami Railroad, Cincinnati, Ohio.
- Cozzens, W. H.,**
Engineer and Surveyor, St. Louis, Mo.
- Alfred W. Craven,**
Chief Engineer Croton Aqueduct, New York.
- Davidson, M. O.,**
Eckhart Mines, Alleghany Co., Maryland.
- Fisk, Charles B.,**
Cumberland and Ohio Canal, Washington, D. C.
- Felton, S. M.,**
Fitchburgh Railroad, Boston, Mass.
- Floyd-Jones, Charles,**
South Oyster Bay, L. I.
- Gzowski, Mr.,**
St. Lawrence & Atlantic Railroad, Montreal, Canada.
- Gilbert, Wm. B.,**
Rutland and Burlington Railroad, Rutland, Vt.
- Grant, James H.,**
Nashville and Chattanooga R. R., Nashville, Tenn.
- S. W. Hill,**
Mining Engineer and Surveyor, Eagle River, Lake Superior.
- Hewson, M. Butt,**
Memphis, Tenn.
- Holcomb, F. P.,**
Southwestern Railroad, Macon, Ga.
- Johnson, Edwin F.,**
New York and Boston Railroad, Middletown Ct.
- Latrobe, B. H.,**
Baltimore and Ohio Railroad, Baltimore, Md.
- Miller, J. F.,**
Worcester and Nashua Railroad, Worcester, Mass.
- Morris, Elwood,**
Schuylkill Navigation, Schuylkill Haven, Pa.
- Morton, A. C.,**
Atlantic and St. Lawrence Railroad, Portland, Me.
- McRae, John,**
South Carolina Railroad, Charleston, S. C.
- Nott, Samuel,**
Lawrence and Manchester Railroad, Boston.
- Prichard, M. B.,**
East Tennessee and Georgia R. R., Cleveland, Tenn.
- Roebbling, John A.,**
Trenton, N. J.
- W. Milnor Roberts,**
Bellefontaine and Indiana Railroad, Marion, Ohio.
- Roberts, Solomon W.,**
Ohio and Pennsylvania Railroad, Pittsburgh, Pa.
- Sanford, C. O.,**
South Side Railroad, Virginia.
- Schlatter, Charles L.,**
Northern Railroad (Ogdensburg), Malone, N. Y.
- Sours, Peter,**
Rahway, New Jersey.

- Stark, George.,**
Bost., Con. and Mont. R. R., Meredith Bridge, N. H.
- Steele, J. Dutton,**
Pottstown, Pa.
- Trautwine, John C.,**
Panama Railroad—Address through office of Panama Railroad Co., 73 Broadway, N. Y.
- Trimble, Isaac R.,**
Philad., Wil. & Baltimore Railroad, Wilmington, Del.
- Tinkham, A. W.,**
United States Fort, Bucksport, Me.
- Thomson, J. Edgar.,**
Pennsylvania (Central) Railroad, Philadelphia.
- Troost, Lewis,**
Alabama and Tennessee Railroad, Selma, Ala.
- Whipple, S.,**
Civil Engineer and Bridge Builder, Utica, N. Y.
- Williams, E. P.,**
Auburn and Schenectady Railroad, Auburn, N. Y.
- Williams, Charles H.,**
Milwaukee, Wisconsin.

HOTELS.

- Exchange Hotel,**
Adjoining Eastern Railroad Depot,
BUFFALO, N. Y.
BY.....**FISK & SPERRY,**
Late of Delevan House, Albany.
- J. D. Abraham, Architect,**
NO. 300 MAIN STREET,
BUFFALO, N. Y.
- Fountain Hotel,**
LIGHT STREET, BALTIMORE,
P. THURSTON.....Proprietor.
- DUNLAP'S HOTEL,**
On the European Plan,
NO. 135 FULTON STREET,
Between Broadway and Nassau St.,
NEW YORK.
- MANSON,**
Corner of Maine and Exchange Streets,
P. DORSHIMER. **BUFFALO.**
- GUY'S**
United States Hotel,
(Opposite Pratt street Railroad Depot.)
BALTIMORE.
JOHN GUY. WILLIAM GUY.
- American Hotel,**
Pratt street, opposite the Railroad Depot,
BALTIMORE.
HENRY M. SMITH.....Proprietor.
Late of the Exchange & St. Charles Hotels, Pittsburg.
- Washington Hotel,**
BY JOHN GILMAN,
\$1 Per Day.
No. 206 Pratt street, (near the Depot.)
BALTIMORE.
- Barnum's City Hotel,**
MONUMENT SQUARE, BALTIMORE.
This Extensive Establishment, erected expressly for a Hotel, with every regard to comfort and convenience, is situated in the centre and most fashionable part of the city, and but a few minutes' walk from the Railroad Depots and Steamboat Landings.
The House has lately undergone a thorough repair, embracing many valuable improvements, and will accommodate 250 Guests. **BARNUM & CO.**
- JONES' HOTEL,**
NO. 152 CHESTNUT STREET,
PHILADELPHIA.
BRIDGES & WEST, Proprietors.

BUSINESS CARDS.**Lithography.**

JOHN P. HALL & CO.,
161 Main st. Buffalo, (Commercial Advertiser Build.)
Are prepared to execute all kinds of Lithography in good style and at reasonable rates. Particular attention will be paid to Engraving Railroad Maps, Engineer's Plans and drafts, etc., and orders in this line are respectfully solicited.

J. T. Hodge

Will attend to the examination of mining tracts near Lake Superior, and prepare Reports and Maps.
Address, during the Summer,
[Ontanagon Postoffice, Lake Superior.

Cumberland Steam Coal,

FROM THE
FROSTBURG MINES, MD.

H. A. TUCKER,
Agent of Frostburg Coal Co.
No. 50 Wall Street, New York.

Eaton, Gilbert & Co.,

Railroad Car, Coach and Omnibus Builders,
TROY, N. Y.

Charles T. Jackson, M. D.,

STATE ASSAYER, late Geologist to Maine, Rhode Island, New Hampshire, and the United States, offers his services to his friends and the public in making any Chemical, Mineralogical or Geological researches that may be required for the improvement of Agriculture and the Manufacturing Arts. Particular attention will be paid to the exploration of mines and to assaying of ores of the metals.

State Assayer's office, 31 Somerset st.
Boston Sept. 3, 1850.

To Railroad Companies and Mechanical Establishments.

A Person of considerable experience and practical knowledge in Mechanical, Civil and Marine Engineering, is anxious to meet with an engagement with either a Private Individual or Public Company, who may have works either to design or execute in the above branches of the Engineering Profession.

Address Z. Y., 47 Atlantic st., South Brooklyn, L.I.

STEEL AND FILES.

R. S. Stenton,
20 CLIFF STREET, NEW YORK,
AGENT FOR

J. & Riley Carr's
BAILEY-LANE WORKS, SHEFFIELD,
Manufacturers of Cast, Shear, German and Blister
STEEL

Of all descriptions. *Warranted Good*
FILES.

Manufacturers of Machinists' Warranted Best Cast Steel Files, expressly for working upon Iron and Steel, made very heavy for recutting.

✓ A full Stock of Steel and Files at all times on hand. 6m4

Walter R. Johnson,

CIVIL AND MINING ENGINEER AND ATTORNEY for Patents. Office and Laboratory, F St., opposite the Patent office, Washington, D. C.

Dudley B. Fuller & Co.,
IRON COMMISSION MERCHANTS,
No. 139 GREENWICH STREET,
NEW YORK.

Manning & Lee,
GENERAL COMMISSION MERCHANTS,
NO. 51 EXCHANGE PLACE,
BALTIMORE.

Agents for Avalon Railroad Iron and Nail Works.
Maryland Mining Company's Cumberland Coal 'CED'
—'Potomac' and other good brands of Pig Iron.

Cop Waste.

CLEAN COP WASTE, suitable for cleaning Railroad, Steam boat and Stationary Engines, constantly on hand and for sale by

KENNEDY & GELSTON,
54 Pine St., New York.

October 27, 1849, 3m

PLUSHES

FOR

Railway Cars & Omnibuses.**F. S. & S. A. MARTINE,**
112 WILLIAM ST., NEAR JOHN.

ARE now receiving a large and complete assortment of Plain and Figured PLUSHES, of their own importation, which will be sold at the lowest market price, viz: Crimson, Maroon, Scarlet, Green, Blue, Purple, etc.

ALSO—CURLED HAIR, the best manufactured in market.

Samuel Kimber & Co.,**COMMISSION MERCHANTS**

WILLOW ST. WHARVES, PHILADELPHIA.

AGENTS for the sale of Charcoal and Anthracite Pig Iron, Hammered Railroad Car and Locomotive Axles, Force Pumps of the most approved construction for Railroad Water Stations and Hydraulic Rams, etc., etc.
July 27, 1849.

James Herron, Civil Engineer,OF THE UNITED STATES NAVY YARD,
PENSACOLA, FLORIDA.

PATENTEE OF THE

HERRON RAILWAY TRACK.

Models of this Track, on the most improved plans, may be seen at the Engineer's office of the New York and Erie Railroad.

To Railroad Companies.**—WROUGHT IRON WHEELS—**

SAFETY AND ECONOMY.

NORRIS' LOCOMOTIVE WORKS,
SCHENECTADY, NEW YORK.

Are Manufacturing Wrought Iron Driving, Truck, Tender, and Car Wheels—made from the best American Iron. Address
E. S. NORRIS.
May 16, 1849.

Manufacture of Patent Wire
ROPE AND CABLES,

For Inclined Planes, Suspension Bridges, Standing Rigging, Mines, Cranes, Derrick, Tillers, &c., by
JOHN A. ROEBLING, Civil Engineer,
TRENTON, N. J.

Doremus & Harris,ANALYTICAL & CONSULTING CHEMISTS,
179 BROADWAY, NEW YORK.**SCHOOL OF CHEMISTRY.****To Engineers and Surveyors.**

E. BROWN AND SON Mathematical inst. makers No. 27 Fulton Slip, New York, make and keep for sale, Theodolites, Levelling inst., Levelling rods, Surveyors Compasses, and Chains, Cases of Mathematical drawing insts. various qualities, together with a general assortment of Ivory Scales and small insts. generally used by Engineers.

Ranstead, Dearborn & Co.,

MANUFACTURERS OF

LOCOMOTIVE CRANKS AND CAR AXLES,

ALSO

WROUGHT IRON SHAFTING,

And All Kinds of Hammered Shapes.

Forge at Commercial Point, Dorchester,
Office 25 Foster's Wharf, opposite No. 211 Broad St.
BOSTON.

Henry I. Ibbotson,

IMPORTER of Sheffield and Birmingham Goods.
Also, Agent for the Manufacture of Telegraph Wire.
218 PEARL ST., NEW YORK.

Cumberland, (Md.,) Coals for
Steaming, etc.

ORDERS RECEIVED FOR AND FILLED
by J. COWLES, 27 Wall St., N. Y.

Samuel D. Willmott,MERCHANT, AND MANUFACTURER OF
CAST STEEL WARRANTED SAWS,

—AND FILES—

IMPORTER OF THE
GENUINE WICKESLY GRINDSTONES
NO. 8 LIBERTY STREET,
NEW YORK.

Railroad Instruments.

THEODOLITES, TRANSIT COMPASSES, and Levels, with Fraunhofers Munich Glasses, Surveyor's Compasses, Chains, Drawing Instruments, Barometers, etc., all of the best quality and workmanship, for sale at unusually low prices, by
E. & G. W. BLUNT,
No. 179 Water St., cor. Burling Slip.
New York, May 19, 1849.

IRON.**Car Wheel Iron.**

100 Tons "Columbia" No. 2 Cold Blast Charcoal

Iron.

300 Tons "Salisbury" No. 1, do. do.

For sale by CHARLES T. GILBERT,
No. 80 Broad st.

New York, Sept. 21, 1850.

Railroad Spikes.

THE subscribers are prepared to make and execute contracts for Railroad Spikes of a superior quality, manufactured by the New Jersey Iron Company, at Boonton.
DUDLEY B. FULLER & CO.
139 Greenwich st. corner of Cedar.

Railroad Iron.

FOR SALE—500 Tons of superior flat bar Railroad Iron, two and a half by three-fourths—which has been in use on the Cumberland Valley Railroad for about three years. For terms apply to Henry J. Bidle, Esq., Philadelphia, or to FREDK. WATTS, President of the Cum. Val. R.R., Carlisle, Pa.
Carlisle, Sept. 17, 1850.

Railroad Iron.

1650 Tons, weighing about 61 lbs. per yard, 40 tons, weighing about 52 lbs. per yard, and 825 tons, weighing about 53½ lbs. per yard, of the latest and most approved patterns of T rail, for sale by
BOORMAN, JOHNSTON & CO.,
119 Greenwich street.

New York, Aug. 26, 1850.

N.B.—R. J. & Co are also prepared to take contracts for English rails, delivered in any of the Atlantic ports of the United States.

Railroad Iron.

THE Undersigned, Agents for Manufacturers, are prepared to contract to deliver Rails of superior quality, and of any size or pattern, to any ports of discharge in the United States.

COLLINS, VOSE & CO.,
74 South St.

New York, June 1, 1850.

Railroad Iron.

1,500 Tons weighing 58 lbs. per lineal yard.
500 " " 57 " "
500 " " 56 " "
500 " " 60 & 61 lbs. "

Also 24x½ flat rails. All the above being of approved patterns. For sale by
DAVIS, BROOKS, & CO.,
68 Broad street.

N.B.—Rails imported on commission, or at a fixed price.

Iron.

Pig Iron, Anthracite and Charcoal; Boiler and Flue Iron, Spring and Blistered Steel, Nail Rods, Best Refined Bar Iron, Railroad Iron, Car Axles, Nails, Stove Castings, Cast Iron Pipes of all sizes, Railway Chairs of approved patterns for sale by
COLEMAN, KELTON & CAMPBELL,
109 N. Water St., Philadelphia.

Railroad Iron.

THE UNDERSIGNED, HAVING made arrangements abroad, are prepared to contract for the delivery of Foreign rails, of approved brands upon the most favorable terms.

They will also make contracts for American rails, made at their Trenton works, from Andover Iron, in whole or in part, as may be agreed upon.

They are prepared to furnish Telegraph, Spring and Market Wire; Braziers and Wire Rods; Rivets and Merchant Bars to order, all made exclusively from Andover Iron. The attention of parties who require iron of the very best quality for special purposes, is respectfully invited.

COOPER & HEWITT,
17 Burling Slip, New York.

February 15, 1850.

Glendon Refined Iron.

Round Iron, Band Iron, Hoop Iron,
Square " Flat " Scroll "

Axles, Locomotive Tyres,
Manufactured at the Glendon Mills, East Boston, for sale by
GEORGE GARDNER & CO.,
5 Liberty Square, Boston, Mass.
Sept. 15, 1849. 3m37

PATENT HAMMERED RAILROAD, SHIP & BOAT SPIKES.—The Albany Iron Works have always on hand, of their own manufacture, a large assortment of Railroad, Ship and Boat Spikes from 2 to 12 inches in length, and of any form of head. From the excellence of the material always used in their manufacture, and their very general use for railroads and other purposes in this country, the manufacturers have no hesitation in warranting them fully equal to the best spikes in market, both as to quality and appearance. All orders addressed to the subscribers at the works will be promptly executed.

JOHN F. WINSLOW, Agent.
Albany Iron and Nail Works, Troy, N. Y.
The above Spikes may be had at factory prices, at Erastus Corning & Co Albany; Merrill & Co., New York; E. Pratt & Brother, Baltimore Md.

LAP—WELDED
WROUGHT IRON TUBES

FOR

TUBULAR BOILERS,

FROM ONE AND A QUARTER TO SEVEN INCHES IN DIAMETER.

THE ONLY Tubes of the same quality and manufacture as those so extensively used in England, Scotland, France and Germany, for Locomotive, Marine and other Steam Engine Boilers.

THOMAS PROSSER & SON, Patentees,
28 Platt street, New York.

Railroad Iron.

THE UNDERSIGNED ARE PREPARED TO contract for the delivery of English Railroad Iron of favorite brands, during the Spring. They also receive orders for the importation of Pig, Bar, Sheet, etc. Iron.

THOMAS B. SANDS & CO.,
73 New street,
February 3, 1849. New York.

Iron Store.

THE Subscribers, having the selling agency of the following named Rolling Mills, viz: Norristown, Rough and Ready, Kensington, Triadelphia, Pottsgrove and Thorndale, can supply Railroad Companies, Merchants and others, at the wholesale mill prices for bars of all sizes, sheets cut to order as large as 58 in. diameter; Railroad Iron, domestic and foreign; Locomotive tire welded to given size; Chairs and Spikes; Iron for shafting, locomotive and general machinery purposes; Cast, Shear, Blister and Spring Steel; Boiler rivets; Copper; Pig Iron, etc., etc.

MORRIS, JONES & CO.,
Iron Merchants,
Schuylkill 7th and Market Sts., Philadelphia.
August 16, 1849. 1y33

Railroad Iron.

THE MOUNT SAVAGE IRON WORKS, Alleghany county, Maryland, having recently passed into the hands of new proprietors, are now prepared, with increased facilities, to execute orders for any of the various patterns of Railroad Iron. Communications addressed to either of the subscribers will have prompt attention. J. F. WINSLOW, President

Troy, N. Y.
ERASTUS CORNING, Albany
WARREN DELANO, Jr., N. Y.
JOHN M. FORBES, Boston.
ENOCH PRATT, Baltimore, Md.

November 6, 1849.

Railroad Iron.

THE SUBSCRIBERS ARE PREPARED TO take orders for Railroad Iron to be made at their Phoenix Iron Works, situated on the Schuylkill River, near this city, and at their Safe Harbor Iron Works, situated in Lancaster County, on the Susquehanna river; which two establishments are now turning out upwards of 1800 tons of finished rails per month.

Companies desirous of contracting will be promptly supplied with rails of any required pattern, and of the very best quality.

REEVES, BUCK & CO.
45 North Water St. Philadelphia,
March 15, 1849.

Tredegair Iron Works.

ROLLING MILL FOUNDRY AND MACHINE SHOPS. The undersigned continues to manufacture at his Works in this city (from best charcoal metal) Bar Iron of every description, embracing Rounds and Squares, from 1½ to 5 inches diameter. Flats, from 1 to 7 inches, all thicknesses. Bands and Scrolls, all sizes. Boiler plate and Plough Iron. Railroad and Locomotive Axles and Tires. Locomotive Frames, Spikes and Plates. Hoops, Ovals, Half Ovals, Half Rounds, Angle, T, L, and indeed every description of Iron usually manufactured, all of which he warrants to be equal to any made in this country. He also manufactures at his Foundry and Machine Shops all descriptions of Railroad Work, say, Locomotives, Railroad Wheels and Axles complete and ready for the road, Railroad Chairs, etc. Also, Marine and Stationary Engines all sizes, Sugar mills and Engines, Horse mills, and every kind of Machinery usually required for the operations of the country. He has paid particular attention to getting up machinery, etc., for Gold Mine operations, and those in want of such work might find it to their advantage to give him a call.

J. R. ANDERSON.
Richmond, Va., Sept. 10, 1850.

CUT NAILS OF BEST QUALITY, BAR IRON (including Flat Rails) manufactured and for sale by
FISHER, MORGAN & CO.,
75 N. Water St., Philadelphia.

Iron Wire.

REFINED IRON WIRE OF ALL KINDS, Card, Reed, Cotton-flyer, Annealed, Broom, Buckle, and Spring Wire. Also all kinds of Round, Flat or Oval Wire, best adapted to various machine purposes, annealed and tempered, straightened and cut any length, manufactured and sold by
ICHABOD WASHBURN.
Worcester, Mass., May 25, 1849.

Wheel, Forge and Foundry Iron.

LOCUST GROVE Wheel Iron of great strength and superior chilling property.
Balt. Charcoal Forge Iron, from Patuxent, Curtis Creek and Gunpowder furnaces.
Elkridge Foundry Iron, of superior strength and softness. Anthracite and Charcoal Iron from Pennsylvania and Virginia. Gas and Water Pipes, Lamp Posts from Elkridge furnace.

LEMMON & GLENN,
6m9 62 Buchanan's Wharf, Baltimore.

S. S. Keyser & Co., IRON WAREHOUSE,

Corner of South and Pratt Streets,
BALTIMORE, MD.

Selling Agents for the Rough and Ready Bar Iron and Elk Boiler and Flue Iron Rolling Mills, Sarah and Taylor Furnaces, and Wrightsville Hollow Ware Foundry, and Dealers in Bar and Sheet Iron, and Cast, Sheer, German, Blister, Spring and Electroplated Steel, etc., etc.

Smith & Tyson,

GENERAL COMMISSION MERCHANTS,

No. 25 South Charles St., Baltimore, Md.

AGENTS for the Celebrated Columbia Pig Iron, suitable for Car Wheels and Chilled Rolls. Columbia refined Charcoal Blooms; Refined Charcoal Juniata Billet Iron for Wire; Refined Iron for Bridging, of great strength; Cut Nails, Spikes, and Brads; Railroad Spikes and Wrought Chairs. 22tf

Stickney & Beatty,

DEALERS IN IRON AND IRON MANUFACTURERS.

AGENTS for the Balt. City Rolling Mill, from which establishment they are prepared to furnish Ellicott's round, square, and flat bar iron, puddled and charcoal boiler plates and billet iron—also agents for the sale of the Laurel and Maryland (Balt.) charcoal forge pig irons, Balt. hard iron for chilling wheels, anti-rust nails, Catocotin foundry iron, boiler blooms from the Caledonian works, Wm. Jessop & Son's cast steel, Coteman's blister steel and nail rods, hoop, band, sheet, oval and common English iron.

Nos. 18 and 20 South Charles st., Baltimore.

Railroad Iron.

CONTRACTS made by the subscribers, agents for the manufacturers, for the delivery of Railway Iron, at any port in the United States, at fixed prices, and of quality tried and approved for many years, on the oldest railways in this country.

RAYMOND & FULLERTON, 45 Cliff St.

IRONDALE PIG METAL, MANUFACTURED and for sale by the Bloomsburg Railroad Iron Co.
LINDLEY FISHER, Treasurer.
75 N. Water St., Philadelphia.

Railroad Iron.

2000 Tons, weighing 58 pounds per lineal yard, of the most approved pattern of T rails, in store and to arrive, for sale by
COLLINS, VOSE & CO.,
74 South St.
New York, June 1, 1850.

Railroad Iron.

3,000 TONS C. L. MAKE 63½ lbs. per yard, now landing and to arrive.
Also contracts made for future delivery of above superior make English Iron.
300 Tons Banks Best Iron, Round, Square and Flat.
200 " English Bar " " " "
10 " 9-16 Square Iron for Railroad Spikes.
For sale in lots to suit purchasers by
DAVID W. WETMORE.
New York, March 26, 1850. 3m

WILLIAM JESSOP & SONS' CELEBRATED CAST-STEEL.

The subscribers have on hand, and are constantly receiving from their manufactory,
PARK WORKS, SHEFFIELD,
Double Refined Cast Steel—square, flat and octagon. Best warranted Cast Steel—square, flat and octagon. Best double and single Shear Steel—warranted. Machinery Steel—round.
Best and 2d gy. Sheet Steel—for saws and other purposes.
German Steel—flat and square, "W. I. & S." "Eagle" and "Goat" stamps.
Genuine "Sykes," L. Blister Steel.
Best English Blister Steel, etc., etc., etc.
All of which are offered for sale on the most favorable terms by
WM. JESSOP & SONS,
91 John street, New York.
Also by their Agents—
Curtis & Hand, 47 Commerce street, Philadelphia.
Alex'r Fullerton & Co., 119 Milk street, Boston.
Stickney & Beatty, South Charles street, Baltimore.
May 6, 1848.

JOHNSON, CAMMELL & Co's Celebrated Cast Steel,

AND
ENGINEERING AND MACHINE FILES, which for quality and adaptation to mechanical uses, have been proved superior to any in the United States. Every description of square, octagon, flat and round cast steel, sheet, shovel and railway spring steel, best double and single shear steel, German steel, flat and square, goat stamps, etc. Saw and file steel, and steel to order for any purposes, manufactured at their Cyclops Steel Works Sheffield.

JOHNSON, CAMMELL & CO.,
100 William St., New York.

November 23 1849.

Railroad Iron.

THE Undersigned, Agents for Manufacturers, are prepared to contract for the delivery of English, Welsh and Scotch Rails, of any pattern and weight, also for every description of English, Welsh, Scotch, and Swedish Iron, Railway Chairs and Spikes, Rivets, Bolts, Nuts, Washers, Chain Cables, Anchors, Tin Plates, German Splinter, Iron Castings, and every description of Machinery.

WILLIAM BIRD & CO.,
Iron and Tin Plate Merchants,
44 Wall st., New York.

And at 5 Martin's Lane, City, London,
and 140 Buchanan st., Glasgow.

July 27th, 1850.

To the Proprietors of Rolling Mills and Iron Works.

THE Undersigned—Proprietors of Townsend's Furnace and Machine Shop, Albany—are extensively engaged in the manufacture of Machinery and fixtures for Iron, and Copper Rolling Mills, and Iron Works. Having paid particular attention to the manufacture of *Rolls* (Rollers), both *chilled* and *dry-sand*, they feel confident that they can execute orders for such castings in a satisfactory manner. And to give assurance of this, they beg leave to refer to the following named persons, proprietors and managers of some of the most extensive rolling mills in the country, viz: Jno. F. Winslow, J. Tuckerman, H. Burden, W. Burt, J. & J. Rogers, Saltus & Co., J. B. Bailey, L. G. B. Cannon, Hawkins & Atwater, etc., etc.

F. & T. TOWNSEND.

Albany, August 18, 1849.

Railroad Iron.

B. O. Railway Tires, Railway Wheels,
Scotch Pig Iron, Tin Plates and Banca Tin,
Muntz's Patent Metal Sheathing,
Baltimore Copper.

Contracts for Rails made on behalf of the manufacturers, for delivery at any ports in the United States, at fixed prices.

Bowling Tires and Tire Bars and Scotch Pigs imported to order.

Muntz's Ship-sheathing, and a general stock of Tin Plates and Banca Tin in store, and for sale by
RAYMOND & FULLERTON, 45 Cliff St.

Bowling Iron. Stamped B.O.

Railway Tire Bars Rivet Iron
Locomotive and other Axles Locomotive Frame do
Boiler Plates Bars,
and every other description of this superior Iron.

The subscribers, agents for the sale of Bowling Iron, are prepared to execute orders for importation, especially for railway and machinery uses, with despatch from the manufacturers.

RAYMOND & FULLERTON, 45 Cliff St.

Lovegrove's Patent Cast Iron Water and Gas Pipes,

THE Subscriber, the Inventor and Patentee of the Centrifugal mode of giving form to metallic substances while in a molten state, is preparing to make Cast Iron Water and Gas Pipes, of any dimensions, at prices much lower than they can be made in the old manner, and the pipes warranted to stand a pressure of three hundred pounds to the square inch, and to be soft enough to drill. Steam Engines and all kinds of machinery. Cast Iron Doors and Frames, and Mill Castings of every description, made to order.

THOMAS LOVEGROVE,
Machinist and Founder,
West Falls Avenue, below Pratt st., Baltimore.

Ray's Patent India Rubber Car Springs.

Savannah, Ga., May 22, 1850.

FOWLER M. RAY, Esq.,

Dear Sir: I have no hesitation in saying, after having used on our road your springs and Fuller's, that I consider yours decidedly the best in every particular, and in this opinion I am sustained by all our officers. Fuller's spring has a tendency to split, and also to chafe or abrade by the constant friction on the cast iron plates or discs: and in my opinion is not near so elastic as yours.

Your springs, which have been in use on our road for 12 or 15 months past, and in constant use under both passenger and freight cars, are to all appearances as elastic, sound and good, as when first put in use.

We are now building eighty-five new cars, of which for fifty-sets the springs have been ordered of you.

GEORGE A. ADAMS,
Master Carpenter,
Central Railroad and Banking Co. of Georgia.

Connecticut River Railroad Office, }
Northampton, May 4, 1850. }

E. CRANE, Esq.,

Dear Sir: It is now about two years since I first tried the experiment of using a set of Ray's India-rubber Springs upon one of our merchandise cars, and although the car has been in constant service since that time, I do not on examination find the slightest difference either in the thickness or elasticity of the material.

The same result has followed wherever we have applied them, either for wheel or draw springs on Engines, Tenders or Cars. At present we use no other; either in replacing old springs or building new cars—and I am perfectly satisfied that for economy, durability, safety, and ease of motion, that Ray's India-rubber is the best article for Springs which has been presented to the public.

Yours respectfully, J. HUNT,
Supt. Connecticut River Railroad.

EDWARD CRANE, Esq.,

Dear Sir: Having applied to cars of the Boston and Worcester Railroad Corporation, Ray's Vulcanized Rubber Springs (where they have been in use for some two years last past), I have had occasion to observe their operation, and am free to say in answer to your inquiries, that they retain their elasticity perfectly during all changes of atmospheric temperature: and are in my opinion a most valuable acquisition to Railroad Cars—are not liable to derangement, as is the case with steel springs; while at the same time it costs less to apply them. Respectfully yours,

D. N. PICKERING,
Supt. Motive Power, Bost. & Wor. Railroad,
Boston, April 15th, 1850.

Monument Foundry.

A. & W. DENMEAD & SON,
Corner of North and Monument Sts.,—Baltimore,
HAVING THEIR

IRON FOUNDRY AND MACHINE SHOP

In complete operation, are prepared to execute faithfully and promptly, orders for Locomotive or Stationary Steam Engines, Woolen, Cotton, Flour, Rice, Sugar Grist, or Saw Mills,

Slide, Hand or Chuck Lathes, Machinery for cutting all kinds of Gearing, Hydraulic, Tobacco and other Presses, Car and Locomotive patent Ring Wheels, warranted,

Bridge and Mill Castings of every description, Gas and Water Pipes of all sizes, warranted, Railroad Wheels with best faggotted axle, furnished and fitted up for use, complete

Being provided with Heavy Lathes for Boring and Turning Screws, Cylinders, etc., we can furnish them of any pitch, length or pattern.

Old Machinery Renewed or Repaired—and Estimates for Work in any part of the United States furnished at short notice.

June 8, 1849.

**RAILROAD CAR
AND COACH TRIMMINGS.
Doremus & Nixon,
IMPORTERS AND FURNISHERS**

HAVE FOR SALE

Plain Garnet Plush. Fig. Garnet Plush (Butterfly pat.
"Crimson" "Crimson" (Elegant.
"Scarlet" " " (Gen. Taylor.

BROCADELLES.

Crimson Silk Brocadelles. Gold and Maroon do.
Gold and Blue " " Brown "
Silk and Wool " of every color.

MOQUETTES,

Of elegant designs and colors.

GERMAN CLOTH FOR CAR LININGS.

The most beautiful goods ever shown in this country, and the subscribers are the sole agents for the sale of them.

Oil cloths Enamelled with Gold. These goods can be
" " Silver. furnished in any
Do. Silver ground velvet printed. dimensions req'd.

CURLED HAIR

Of every description and quality.

JNO. W. A. STRICKLAND, Agent.
New York, 1850. 1yl6

**FOWLER M. RAY'S
Patent India-rubber Railroad
CAR SPRING.**

New York and Erie Railroad Shops.
Piermont, March 26, 1850.

This will certify that from practical experience in the use of Fowler M. Ray's India rubber Car Springs, I believe them to be far superior to any others now in use.

I have never known them to be affected by any change of temperature, as other Rubber Springs have been affected on this road.

I am at the present time repairing a Passenger Car that Mr. Ray and myself mounted with his springs about two years and eight months since.

The springs are at the present time as perfect, to all appearances, as when first applied to the car.

Respectfully yours,

HORACE B. GARDNER,
Foreman of the Car Shops.

Supt. Office N.Y. & H. R.R.,
New York, March 8, 1850.

This is to certify that we have used the Rubber Springs manufactured by Mr. F. M. Ray for the past twenty months, "both for Passenger and Freight Car Springs and Bumpers, and of different sizes," and have in every case given entire satisfaction, and I consider them the best spring now in use.

M. SLOAT, Supt.

Boston, March 5, 1850.

In answer to your enquiry about India-rubber Springs, I have to say that we have used them to a considerable extent on both freight and passenger cars, and also on several of our tenders; and I am very well satisfied that they answer all the purposes for which they are intended. I believe the India-rubber will soon supersede all other springs for cars and tenders.

Yours truly,

S. M. FELTON,
Supt. Fitchburg Railroad.

Office New Jersey Railroad Co.,
Jersey City, March 8, 1850.

FOWLER M. RAY, Esq.,

Dear Sir: In answer to your enquiries respecting the operation of the Vulcanised Rubber Springs, purchased by our company from you some two years since, I reply that they are superior to any spring in use, (that I have either seen or heard of).

The improved form of your spring, consisting of a solid piece of vulcanised rubber with bands on the outside, is far superior to your first form, consisting of disks of rubber with metallic plates interposed.

The last named form was tried, if you recollect, at a much earlier period; and then was replaced by your last form.

I have no hesitation in saying that your springs have given entire satisfaction, and most cheerfully recommend them to railroad companies throughout the country for the following reasons:

1st. The cost is 30 per cent. less.

2d. Saving of weight on each car of 8 wheels from 700 to 800 lbs.

3d. Less care and attention is required, as they are not liable to get out of repair.

4th. A great saving is secured in the wear and tear of the cars and rails from their great elasticity.

5th. The freedom from noise.

6th. There is greater safety in case of accident, as they cannot be broken.

7th. The comfort of passengers is enhanced sufficiently to pay the expense, waiving all the other reasons that I have given.

Should this fail to satisfy any person enquiring, you are at liberty to refer to me, No. 150 Washington St., Jersey City. Yours respectfully,

T. L. SMITH, Supt.

New York, March 11, 1850.

I have used the Patent India-rubber Spring purchased of Mr. Ray, upon the cars of the New York and New Haven Railroad, and have found them efficient and economical; and when applied to the axles and draw springs, believe them to be quite equal to any in use. I have found a combination of these springs with a steel spring under the transom beam a very satisfactory arrangement, and am now using this plan in all new cars.

Yours respectfully,
ROBERT SCHUYLER.

February 25, 1850.

From practical observation of the use of the India-rubber Car Springs, manufactured and sold by your company, we are entirely satisfied in their application, and do not hesitate to recommend them as elastic, durable, requiring no repairs for years, and retaining their consistency during all extremes of weather. We have applied them for the past two years, and consider them superior for all railroad purposes.

Yours truly,

OSGOOD BRADLEY, Car Builder, Worcester.
T. & C. WASON, do. Springfield.
DEAN, PACKARD & MILLS, do. do.
DAVENPORT & BRIDGES, do. Cambridgeport.

Office of the New Jersey Railroad Co.,
Jersey City, March 7, 1850.

This is to certify that we have had Mr. F. M. Ray's India-rubber Springs in constant use under our cars, and as Bumper Springs for upwards of two years, and they have in every way given perfect satisfaction.

The present form of spring we deem far superior to the form of Disk, having used both forms, although we have none of those made in Disks at present in use.

We take pleasure in recommending these springs to all railroad companies.

J. P. JACKSON, Vice Pres.
New Jersey Railroad and Trans. Co.

Roxbury, February 28, 1850.

In compliance with your request, I take great pleasure in stating the result of my experience in the use of "Ray's Patented Vulcanised India-rubber Car and Engine Springs." We have used them nearly two years, and never had one fail in any way. The cold weather does not affect them, as it has other rubber springs we have used.

With sixteen years' experience as superintendent of machinery on the Boston and Providence railroad, I take pleasure in saying that your springs are the best we ever used, or I ever saw used elsewhere. We have 20 cars rigged with them, of which I can say that the springs are as good now as when first applied. I put 24 lbs. of the rubber under the forward end of one of our heaviest engines, taking off 250 lbs. of steel springs—it has been in use 18 months, and is in as good condition now as when first put under the engine.

Very respectfully yours,

GEO. S. GRIGGS,
Supt. of Machinery, Boston and Prov. R.R.

Fall River, February 2, 1850.

In answer to yours of the 20th ult. I would say that this company has for some 10 or 12 months past been using "Ray's India-rubber Springs." We have applied them to both passenger and freight cars with uniform success. They have invariably preserved their elasticity and consistency through all the extremes of weather; and we are now applying them whenever the steel spring fails. I am well satisfied that they are particularly adapted for railroad purposes.

Very respectfully yours,

GEO. HAVEN,
Supt. Fall River Railroad.

Jersey City, March 9, 1850.

This is to certify that the present form of Mr. F. M. Ray's India-rubber Car Spring I consider far superior to the form of Disk, having used both forms.

I take pleasure in recommending these springs to all railroad companies. **DAVID H. BAKER,**
Foreman of Car Shop of N.J. R.R. & Trans. Co.

Harlem R.R. Depot,
New York, March 7, 1850.

This is to certify that we have used Mr. F. M. Ray's India-rubber Springs for over eighteen months, and find them to be easy and durable, and recommend them to railroad companies as being superior to anything we have tried.

J. M. SMART,
Foreman at 42d St. Depot.

Old Colony Railroad Office,
Boston, March 6, 1850.

EDWARD CRANE, Esq.,

President New England Car Co.,

Dear Sir: In compliance with your request I would state that the Old Colony Railroad Company have had in use upon their road, India-rubber Springs furnished by your company, for more than eighteen months past, during which time they have been extensively used under Passenger and Freight Cars, Locomotive Tenders, and for Drawer and Buffering Springs, with the most perfect success. The elasticity and consistency of the Rubber has never been unfavorably affected by either extremes of heat or cold—and from the experience which we have had in the use of Rubber Springs, I think them well adapted for railroad purposes—and therefore we have for some months past used Rubber almost exclusively, in all places where springs are required.

Respectfully yours, etc.,

JAS. H. MOORE,
Supt. O. C. Road.

Troy, February 27, 1850.

We have been using your India-rubber Car Springs for nearly two years—and we take pleasure in saying that in our opinion the rubber has to a certain extent already, and may eventually entirely supersede all other Springs for Railroad Car purposes. We now use it entirely for Draw Springs and Bumpers, considering it better and lighter than steel.

During our two years' experience in the use of it, we have not known any to lose their elasticity, or fail in any way; and we cheerfully recommend the rubber for railroad car springs. Very respectfully,

EATON, GILBERT & CO.

Passenger Car Linings.

THE Advertiser continues to make to order the Enamelled Car Linings which have been so highly approved the last three years, and are now exclusively used by all the Northern Railroads. No pains are spared to get out new styles, and adapt them to the tastes of every consumer.

Orders addressed to **CHARLES STODDER, No. 75 Kilby street, Boston,** will have prompt attention. March 23, 1850. 2m

India-rubber for Railroad Cos.

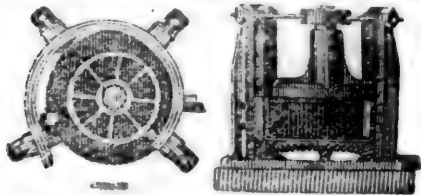
RUBBER SPRINGS—Bearing and Buffer—Fowler's Patent—Hose from 1 to 12 inches diameter. Suction Hose. Steam Packing—from 1-16 to 2 in. thick. Rubber and Gutta Percha Bands. These articles are all warranted to give satisfaction, made under Tyer & Helm's patent, issued January, 1849.—No lead used in the composition. Will stand much higher heat than that called "Goodyear's," and is in all respects better than any in use. Proprietors of railroads do not be overcharged by pretenders.

HORACE H. DAY,
Warehouse 23 Courtlandt street.

New York, May 21, 1849.

Spikes, Spikes, Spikes.

ANY person wishing a simple and effective Spike Machine, or a number of them, may be supplied by addressing **J. W. FLACK,**
Troy, N. Y. March 6, 1850.

MACHINERY.**Henry Burden's Patent Revolving Shingling Machine.**

THE Subscriber having recently purchased the right of this machine for the United States, now offers to make transfers of the right to run said machine, or sell to those who may be desirous to purchase the right for one or more of the States.

This machine is now in successful operation in ten or twelve iron works in and about the vicinity of Pittsburgh, also at Phoenixville and Reading, Pa., Covington Iron Works, Md., Troy Rolling Mills, and Troy Iron and Nail Factory, Troy, N. Y., where it has given universal satisfaction.

Its advantages over the ordinary Forge Hammer are numerous: considerable saving in first cost; saving in power; the entire saving of shingler's, or hammerman's wages, as no attendance whatever is necessary, it being entirely self-acting; saving in time from the quantity of work done, as one machine is capable of working the iron from sixty puddling furnaces; saving of waste, as nothing but the scoria is thrown off, and that most effectually; saving of staffs, as none are used or required. The time required to furnish a bloom being only about six seconds, the scoria has no time to set, consequently is got rid of much easier than when allowed to congeal as under the hammer. The iron being discharged from the machine so hot, rolls better and is much easier on the rollers and machinery. The bars roll sounder, and are much better finished. The subscriber feels confident that persons who will examine for themselves the machinery in operation, will find it possesses more advantages than have been enumerated. For further particulars address the subscriber at Troy, N. Y.

P. A. BURDEN.

Railroad Spikes and Wrought Iron Fastenings.

THE TROY IRON AND NAIL FACTORY, exclusive owner of all Henry Burden's Patented Machinery for making Spikes, have facilities for manufacturing large quantities upon short notice, and of a quality unsurpassed.

Wrought Iron Chairs, Clamps, Keys and Bolts for Railroad fastenings, also made to order. A full assortment of Ship and Boat Spikes always on hand.

All orders addressed to the Agent at the Factory will receive immediate attention.

P. A. BURDEN, Agent,
Troy Iron and Nail Factory, Troy, N. Y.

CHILLED RAILROAD WHEELS.—THE UNDERSIGNED are now prepared to manufacture their Improved Corrugated Car Wheels, or Wheels with any form of spokes or discs, by a new process which prevents all strain on the metal, such as is produced in all other chilled wheels, by the manner of casting and cooling. By this new method of manufacture, the hubs of all kinds of wheels may be made whole—that is, without dividing them into sections—thus rendering the expense of banding unnecessary; and the wheels subjected to this process will be much stronger than those of the same size and weight, when made in the ordinary way.

A. WHITNEY & SON,
Willow St., below 13th,
Philadelphia, Pa.

Brown's Old Established SCALE WARE HOUSE,

NO. 234 WATER ST., NEW YORK.

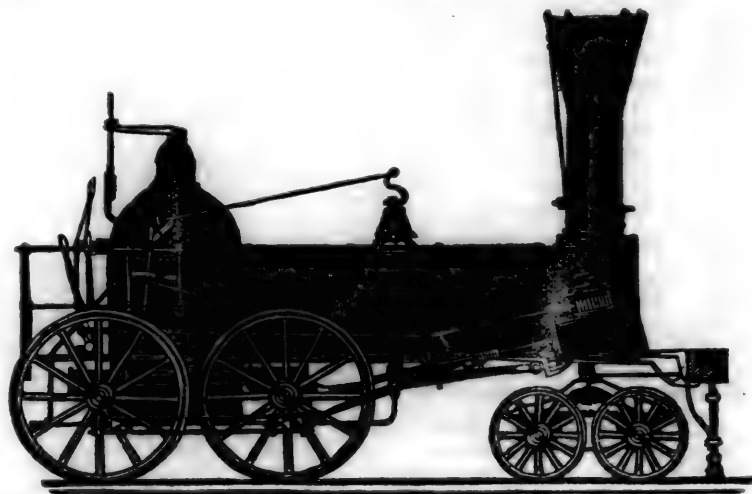
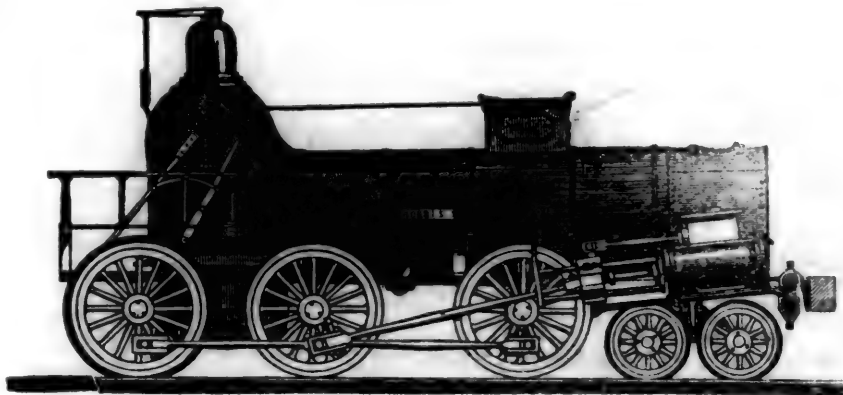
THE Subscriber, Practical Manufacturer of Scales of every description, respectfully asks the attention of Railroad Companies to his Improved Wrought Iron Railroad Track and Depot Scales which for strength, durability, accuracy, convenience in weighing, and beauty of workmanship, are not surpassed by any others in this country.

He is aware that this is rather a bold assertion for him to make, yet he can say with confidence that they have but to be tried to give them precedence over all others.

J. L. BROWN.

Bank Scales made to order, and all Scales of his make Warranted in every particular.

References given if required

NORRIS' LOCOMOTIVE WORKS.
BUSHHILL, SCHUYLKILL SIXTH-ST., PHILADELPHIA.

THE UNDERSIGNED Manufacture to order Locomotive Steam Engines of any plan or size. Their shops being enlarged, and their arrangements considerably extended to facilitate the speedy execution of work in this branch, they can offer to Railway Companies unusual advantages for prompt delivery of Machinery of superior workmanship and finish.

Connected with the Locomotive business, they are also prepared to furnish, at short notice, Chilled Wheels for Cars of superior quality.

Wrought Iron Tyres made of any required size—the exact diameter of the Wheel Centre, being given, the Tyres are made to fit on same without the necessity of turning out inside.

Iron and Brass castings, Axles, etc., fitted up complete with Trucks or otherwise.

NORRIS, BROTHERS

PATENT MACHINE MADE HORSE-SHOES.

The Troy Iron and Nail Factory have always on hand a general assortment of Horse Shoes, made from Refined American Iron.

Four sizes being made, it will be well for those ordering to remember that the size of the shoe increases as the numbers—No. 1 being the smallest.

P. A. BURDEN, Agent,
Troy Iron and Nail Factory, Troy, N. Y.

Etna Safety Fuse.

THIS superior article for igniting the charge in wet or dry blasting, made with DUPONT'S best powder, is kept for sale at the office and depot of

REYNOLDS & BROTHER,

No. 86 Liberty St.

NEW YORK.

And in the principal cities and towns in the U. States. The Premium of the AMERICAN INSTITUTE was awarded to the Etna Safety Fuse at the late Fair held in this city.

November 3, 1849.

ly

COLUMBUS, OHIO,**Railroad Car Manufactory. RIDGWAYS & KIMBALL,**

HAVE established at this central point, the manufacture of Passenger, Freight, Gravel and Hand Cars for Railroads, and assure all Western Railroad Companies that it will be their constant aim to procure the best materials and workmen, and to turn out the best kind of work at fair prices. Specimens may be seen on the Columbus and Xenia Railroad. The patronage of Railroad Companies is respectfully solicited.

ly8

To Inventors and Patentees.

OWEN G. WARREN, ARCHITECT, Has had many years' experience as Agent for obtaining Patents, both in this country and Europe, and will transact such business promptly and reasonably. Persons at a distance can have their business done by correspondence—without the necessity of visiting this city or Washington. Office No. 94 Merchants Exchange, Wall st., corner of Hanover st., up stairs.

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AMERICAN RAILROAD JOURNAL.

STEAM NAVIGATION, COMMERCE, MINING, MANUFACTURES.

HENRY V. POOR, Editor.

ESTABLISHED 1831.

PUBLISHED WEEKLY, AT No. 136 NASSAU ST., NEW YORK, AT FIVE DOLLARS PER ANNUM IN ADVANCE.

SECOND QUARTO SERIES, VOL. VI., No. 39! SATURDAY, SEPTEMBER 28, 1850. [WHOLE No. 754, VOL. XXIII.]

ASSISTANT EDITORS,

J. T. HODGE, *For Mining and Metallurgy.*
GEN. CHAS. T. JAMES, *For Manufactures and the
Mechanic Arts.*
M. BUTT HEWSON, C. E., *For Civil Engineering.*

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American Railroad Journal.

PUBLISHED BY J. H. SCHULTZ & Co., 136 NASSAU ST.

Saturday, September 28, 1850.

Late Accident on the Western Railroad.

We copy below the finding of the coroner's jury held in relation to the recent accident upon this road, by which three persons lost their lives:

That the said Samuel Jone Mumford, John H. Whittemore and Jane Roeselle left Albany on the afternoon of the 9th inst., on the passenger train for Springfield, Mass., belonging to and run by the Western railroad corporation, that soon after leaving the depot at Hinsdale in said county of Berkshire, and when within about one mile of that depot, while the train was moving at the rate of about twenty-five miles an hour, the forward axle of the car in which the persons above named were seated, broke near the centre of said axle, was torn from the trucks, thereby causing the other axles of the same car to be torn from the trucks, thus letting the car down upon the track; that in this condition the car was dragged about three rods; that in the passage of the forward trucks under the car, large

holes were made in the flooring, and several seats were torn up; that the above named deceased persons fell through these holes in the track and thereby received wounds and bruises which caused their instant death.

An adjournment of the said inquisition to the 17th instant was then granted for the purpose of procuring the attendance of men experienced in the manufacture of iron and car axles to examine the condition and investigate the cause of the axle breaking. Upon the testimony thus submitted said jurors do further find—

1st. That said car was constructed for the Western railroad corporation in the year 1848, by the Springfield Car and Engine Co., and that at the time of the accident the car had been running about sixteen months.

2d. That said axle was made of Salisbury iron by an experienced manufacturer whose axles at that time and since have been considered among the best in the market.

3d. That said axle was of the size ordinarily used for passenger cars, and was of sufficient size to have borne all the strain which would have come upon it in ordinary use if it had been in all respects perfectly sound.

4th. That on the morning of the day of the accident an examination of the axle and trucks of said car was made at Springfield by an agent of the Western railroad corporation, and that on the arrival of said car at Albany, said axles and trucks were again examined by an agent of said corporation, at said place, and that no defect was found or was visible at either examination.

5th. That externally said axle appeared to have been perfectly sound and without defect at the place where it broke, up to the time of the accident.

The iron on breaking appears to be of the best quality used for shafts for locomotives and cars.

6th. That if any defect did exist, the crack or flaw was so fine that it would not have been visible on the most careful and thorough examination of the agent of the corporation.

7th. That there may have been an internal defect sufficient to cause the breaking while the surface of the axle remained perfectly sound.

No body to blame here, as usual. It must be poor comfort to travellers to be told virtually, that accidents like the above are unavoidable, that they are liable to them every time they step into a railroad car. Now the report of the jury in this case is a most approved specimen of white-washing, or ignorance. Axles of a proper size do not give way from accident merely. The strength of iron to resist tension or pressure, is about as well known and settled, as the weight of a given quantity. If in a particular case, it yields under a partial test, this must be attributed to a defect in the quality

of the iron, or in the make. Competent judges could undoubtedly have ascertained where the defect lay in this case, a matter which seems entirely to have baffled the skill of the jury.

There is no necessity for using an unsafe axle. A good article can always be had, about which there can be no mistake, provided railroad companies will pay a reasonable price. But companies and individuals are too much in the habit of purchasing the cheapest article. To sell at the low prices which have prevailed for some time past, many manufacturers have, without doubt, made up the loss, by making a poor article. To this is to be attributed many of the dreadful accidents which have been so frequent of late.

The only way to make railroad companies careful of the lives and safety of passengers, is to make it for their interest to be so. The severest penalties should be annexed to accidents arising from their fault. The names of all makers of imperfect or unsafe machinery should be made public; which would act as a most powerful stimulus to secure good work.

For the American Railroad Journal.

The Breaking of Rider's Iron Bridge on the New York and Erie Road.

The reading of Mr. S. Whipple's communication on the breaking of the above bridge, in the Journal of September 21st, induces me to say a few words on the same subject.

Mr. Whipple's remarks, as far as they go, are perfectly correct, in relation to the "Rider" bridge, although I believe that the weakest points in that combination are at the ends next to the abutments. The investigations of that gentleman will always command the respect of those best able to judge, he having proved himself competent to the task in all his publications on bridge building, a qualification which few bridge builders have a right to claim—most structures of wood or of iron being put up at random, or by the "rule of thumb," the inventors and constructors very frequently not even understanding the first elements of statics, much less the application of their principles.

Considering the general want of scientific knowledge, and the great number of newly invented combinations in wood and iron, issuing daily from the Patent Office, puffed up in the journals, and rewarded by gold and silver medals by men who are totally ignorant of what they are investigating, it

is no wonder that such an appalling number of the most frightful accidents should occur, as actually have occurred on many of our railroads within the past few years. I say this is the necessary consequence of that total want of scientific knowledge on the part of those who superintend these structures.

On a new combination of wood or iron being presented to an engineer, it is his province to analyze its merits, and not to rely on puffs and advertisements. He ought to be fully competent to estimate the strength of any bridge, and to point out its weak and its strong parts. After carefully investigating plans and the condition of similar structures already in use, he is then to provide for good materials, and see it well put together. Conscious of having duly considered all the strains to which the structure will be exposed, he will then place full confidence in its capacity and safety.

That a bridge has stood a year or two, is no proof that it will stand another year. Durability and safety can only be insured by a superabundance of strength, and that such exists the engineer should be morally certain.

When the Rider bridge on the New York and Erie railroad was put up, it was observed that its strength had long been tested on the Harlem railroad. All that could be said in favor of that plan, however, was, that none of these bridges had actually broken down as yet. It is true that this was rather more than could be said of some other plans. While the above bridge was being built, I was engaged in the construction of the Delaware Suspension Aqueduct, within three miles of the site of the former. My opinion being asked at the time by some of the parties interested, I took the liberty of expressing my unqualified disapprobation of the "Rider plan." I was further strengthened in the view I had formed, on examining the structure after its completion, when I observed that the extreme rigidity of that frail combination was solely produced by *tight wedging*! This is one of the weak features of the plan, and well calculated to mislead the superficial observer. It appeared to me then that many parts of the structure were in an overstrained condition, and I expected to hear of its downfall every day.

In justice to the superintending engineers then on the road, I must add that none of them appeared to approve of the plan; they were acting under orders, and of course had no business with the planning, nor can they be blamed for the consequences.

I would repeat here, that the weakest parts of Rider's bridge are the ends near, and on the abutments. By terminating the iron network on the abutments in strong cast iron posts, embedded in the masonry, or fastened upon the coping, securing these posts by strong anchors, run back some distance into the masonry, and running a number of stays from their tops to the chords of the span, extending the longest to near the centre, the strength of these bridges might be greatly increased and larger spans be attempted with safety. But the section of the top and bottom chords want also to be greatly enlarged, the upper one needing lateral as well as vertical strength. As it is, the main strain is thrown upon the wrought iron bottom chord, the cast iron top chord from its small section and very little curvature having little or no power to support. In the bridge in question some other glaring defects could be observed, as for instance the attachment of the oak beams, which support the track, to the cast iron posts, which extend vertically from the bottom to the top chords, and which

were simply bolted to their sides. Rider's plan is the best combination for *stiffness*, and the most deficient for *strength*, that has come under my observation. Where stiffness alone is required in a vertical position, without any strength, this plan has great claims.

In conclusion, I would express a hope, that the civil engineers of the United States, in view of their professional standing, will in a body disapprove of the wholesale veto, which the president and directors of the New York and Erie railroad have seen fit in their wisdom to pass indiscriminately upon all iron bridges.

JOHN A. ROEBLING.

Trenton, N. J., Sept. 23, 1850.

Oxygen.

Continued from page 596.

But it was Priestley's discovery of oxygen, on the 1st of August 1774, that completed the overthrow of the phlogiston theory. He procured the gas by concentrating the sun's rays upon a quantity of the red precipitate of mercury, which was placed in a glass flask filled with, and inverted in, quicksilver. "I presently found," says he, "that by means of this lens, air was expelled from it very readily. Having got several times as much as the bulk of my materials, I admitted water to it, and found that it was not imbibed by it. But what surprised me more than I can well express, was, that a candle burned in the air with a remarkably vigorous flame, very much like that enlarged flame with which a candle burns in nitrous air exposed to iron or liver of sulphur; but as I got nothing like this remarkable appearance from any kind of air besides this particular modification of nitrous air, and I knew no nitrous acid was used in the preparation of the *mercurius calcinatus*, I was utterly at a loss how to account for it." It is scarcely possible to refer to a more simple and truthful account of a great discovery; and the spirit of the following short extract from his own prefatory remarks, coincides so well with our own views, that we cannot refrain from taking this opportunity of inserting it:—"The contents of this section will furnish a very striking illustration of the truth of a remark which I have more than once made in my philosophical writings, and which can hardly be too often repeated, as it tends greatly to encourage philosophical investigations, viz., that more is owing to what we call *chance*, that is, philosophically speaking, to the observation of events arising from unknown causes, than to any proper design or preconceived theory in this business. This does not appear in the writings of those who write synthetically upon these subjects, but would, I doubt not, appear very strikingly in those who are the most celebrated for their philosophical acumen, did they write analytically and ingeniously."—(Exp. and Obs., vol. ii. p. 103.) The danger against which he warns us—trust in theory—was one which overcame himself. By his natural powers of observation, aided by great energy and untiring perseverance, he made discoveries that overthrew existing theories, and laid for science a solid foundation of facts; yet he himself named this newly discovered gas "dephlogisticated air," and tenaciously adhered to the title even after its properties and actions had become much better understood. Despite constantly accumulating evidence, he continued to fight under the banners of the phlogistians, and almost his last publication was a tract entitled, "The doctrine of Phlogiston established, and that of the Composition of Water refuted."—He first made the cudgels, and after placing them in vigorous and unsparring hands, deliberately laid himself out for castigation. His life and character are so remarkable, and afford so many points for reflection to all would-be philosophers, that we purpose noticing his career at some length. His many brilliant discoveries, that of oxygen being only one amongst many, although it is the one with which we are at present most concerned, his contrivances for the readier prosecution of pneumatic chemistry, and many other labors of scientific research, entitle him to our very highest regards.—"To err is human," and we should merely look upon his faults as beacons for ourselves; for it will always be a subject of admiration, and an ample

excuse for his defects, that amidst all the persecutions and turmoils of political and theological party controversies, he still found time for the successful pursuit of philosophical experiments; and thus removed the excuse of every one, who, in the palliation of their short-comings in the same labors, would plead the idler's refuge, "want of time."

Joseph Priestley was born at Fieldhead, near Leeds, in 1733. Educated by his aunt with a view to his assuming the functions of a Unitarian dissenting clergyman, in early life he made very considerable progress in the dead languages, Latin, Greek and Hebrew; but from failing health, he was advised to turn his thoughts to trade, and to settle at Lisbon. He therefore applied himself to the modern languages, and learned, as far as possible, French, Italian, and German, without a master. Returning strength brought with it a desire to carry out his first intention of entering the ministry, and accordingly he completed his academical studies at Daventry. He studied keenly, and from the peculiar position of the academy, freedom of discussion being allowed and encouraged to its full extent, and the two masters espousing different opinions, he became, almost necessarily, both well skilled in, and much addicted to, controversial subjects, and apt in maintaining his own speculative opinions. His studies not only embraced the ordinary course relating to theology and divinity, but included mechanical philosophy and metaphysics, and some knowledge of Chaldee, Syriac, and Arabic. On leaving the academy, he became assistant in a small meeting house at Needham, from which he never received more than £30 a year.—His theological opinions drove away his hearers, and still further diminished his income. He attempted to open a school; but the odium attached to his tenets prevented his success, and at length he became indebted for the means of subsistence to the aid of charitable funds procured through Drs. Benson and Kippis. His unpopularity placed all the vacant situations in the neighborhood beyond his reach, and nearly every one treated him with contempt; but when in after years the then popular Dr. Priestley came to preach in that locality, the chapels were thronged with those who eagerly flocked to hear the same sermons which they had in former days so unequivocally and so bitterly condemned. He at length succeeded in obtaining a meeting house at Nantwich, in Cheshire, where he met with a better reception, doubtless in some measure owing to his careful avoidance of controversial subjects. He opened a school, and found it both agreeable and profitable; and he employed his leisure time in giving private lessons in the house of a neighboring and eminent attorney. He was able to procure books and a few philosophical instruments, wrote a grammar for his school, and even found time to learn to play a little on the flute.

The Warrington Academy had been founded during his stay at Needham, and on a vacancy occurring in the office of tutor in the languages, he was invited to accept it, and accordingly left Nantwich for that purpose. He there, at Warrington, wrote his "History of Electricity," which first brought him into note as an experimental philosopher, and enabled his friends to procure for him the title of Doctor of Laws from the Edinburgh university. From quarrels between various parties connected with the institution, he was induced to leave it, and, in 1767, accepted an invitation to take charge of Minhill chapel, at Leeds, where he had ample leisure to pursue his favorite studies, and produced numerous works, many of them controversial. His chemical career was likewise commenced at Leeds, and he was accidentally led to think of pneumatic chemistry by witnessing the operations at a brewery near his residence. After six years' residence in Leeds, the Earl of Shelburne, afterwards Marquis of Lansdowne, engaged him as librarian and literary companion, at a salary of £250 and a house. It was during this engagement that he made his celebrated discovery of oxygen. In company with his lordship, he visited the continent, travelling through Holland, France and Germany, and residing some time at Paris. In the course of a few years, Priestley and Lord Shelburne separated by mutual consent; and, in accordance with a previous stipulation, his lordship settled upon him an annuity of £150, which was regularly paid during the remainder of Priestley's life.

To add to his diminished income, several of his friends, headed by Dr. Fothergill, raised a subscription to enable him to carry out his experiments to their full extent. He then settled at a meeting house in Birmingham, and pursued his theological and chemical investigations with increased ardour. He completed former philosophical works, continued his periodical, "The Theological Repository," published numerous tracts in support of his peculiar opinions, and upon the history of the primitive church. At first he gained great popularity, but he unluckily ventured to attack the established clergy of the place, and expressed his political convictions with a force and vehemence that were particularly unsuited to the troubled times of the French Revolution, and especially opposed to the avowed maxims of Mr. Pitt and his administration.

Priestley answered Mr. Burke's book on the French Revolution, and thus incurred the enmity of that extraordinary man, who, in the House of Commons, repeatedly inveighed against his character and writings with peculiar virulence. The clergy of the Church of England also leagued against him, and were joined by his political opponents, now his mortal enemies; for, educated in controversy, he was scarcely prudent in debate, and endangered the success of his cause by unsparring vehemence. This agitation soon produced its fruits. In 1791, on the day of the anniversary of the French Revolution, the populace burned down his meeting house and residence. They cast his library, manuscripts, and apparatus, into the incendiary flames. His son owed his life to the forcible restraint of a friend. The dwellings of his friends were sacked, burned and plundered, and he made his escape to London in disguise. He was invited to succeed Dr. Price at a meeting house at Harewood, but so great was the dread of his unpopularity, that no one would let him a house for fear of its destruction by the mob. And so far was this feeling carried, that, although a "Fellow," yet the members of the Royal Society drove him from their company, and compelled him to withdraw his name. Such was the persecution of opinion in England during the last ten years of the eighteenth century! True those opinions were distasteful to the multitude, and were advocated strenuously and vehemently in the full and bitter spirit of party controversy; yet they were received with tenfold more disgraceful alarm. Fear, hatred, and malignity, all rose up in arms against him. The members of the Established Church procured a bishopric for Dr. Horsley, who, in their opinion, had completely refuted Priestley's theological arguments; yet they still feared the effect of his writings, notwithstanding the so-called victory of their well-rewarded champion.

It is always thus with religious and political ultra zeal. Most sectarians preach, few practise, universal toleration. Political differences, too, frequently lead to enmity. So also in scientific disputes. Opponents lose their tempers, special pleading succeeds to plain statements of facts, acrimony and recrimination hide all beneath a cloud of passion, and the subject of the search is buried in the dust of the debate.

Priestley eventually emigrated to America, where he was received with much respect, and established himself in Northumberland, 130 miles from Philadelphia, and gradually resumed his former pursuits, and, as an almost necessary consequence, created fresh enemies, and so lost ground in popular esteem as to be threatened with expulsion as an alien. Matters, however, did not proceed to extremities, Priestley's forbearance helping to allay the whirlwind; and he died in America, having the pleasure of finding respect for his energy and perseverance gradually on the increase during his latter years. Had he been less controversial; had his mind been less ready to defend its theoretical positions; in short, had he possessed more of the calm deliberate equity of the judge, and less of the one-sided animus of the special pleader, he would have employed his own discoveries in the cause of truth—would have laid the science of chemistry under far greater obligations than any other man could hope to do, and would have raised himself to a pinnacle of fame unattained by any other philosopher. All this was hindered by his habit of argument. We cannot too often remember that our

search should be truth, and that only. Victory in debate may be defeat in reality; acuteness, impetuosity, or tact, may silence a less able adversary, who, though unapt at rejoinder, may yet have right on his side. The habit of mere discussion, or rather of debate, led Priestley to maintain what he should have calmly considered. It was he who discovered the method and provided the tools, but left it to others to employ them, and so to speak, enrolled himself an antagonist to the children of his own brain.

Antoine Laurent Lavoisier, working but little in the quarry, became the architect of other men's labors. He may be said to be the first who systematically applied the balance to the result of chemical experiments, and thus established a judge whose faculties are never unduly influenced. The impetus this gave to science has never been lost, but it continues to move with a constantly accelerated velocity. Lavoisier was born in Paris, in 1743, and fell a victim to the Revolution in 1794. His theories of combustion and acidification have been already referred to, and, though imperfect, they will always redound to his honor. He unfortunately proclaimed himself the discoverer of oxygen, and thus laid himself open to deserved animadversion. Priestley, while at Paris, mentioned his discovery at a philosophical meeting at Lavoisier's table; and mentions this circumstance in his last publication, and so corroborates his assertion by various facts, that we can only lament that so eminent a man as Lavoisier should have descended to such meanness.

Lavoisier's theory, or "the French Chemistry," as it was called in claptrap patriotism, by Fourcroy, born in Paris, 1755, died 1809, has been so often unduly praised, that while we admit our debt to Lavoisier for his eminent ability in logical induction from facts ascertained by others, and for his skillful reviews and dissection of hypothesis, we cannot refrain from quoting the following paragraph from Brande, and with it shall close our present essay:—

"The prominent features of the French theory are its explanation of the phenomena of combustion and acidification, the presence of oxygen being essential in both cases. That air is the food of fire was known in the remotest ages; and that it causes the increase of weight sustained by metals during their fusion and calcination, was shown by Rey early in the seventeenth century; that a part only of the atmosphere is concerned in the support of flame, was explained by Hook in 1667; and that the vital or igneous spirit, as he terms it, of the atmosphere, is concerned in the formation of acids, was asserted by Mayow in 1674. Here, without advancing into the eighteenth century, we have, in explicit detail, all the facts and arguments necessary for the construction of the French theory; but if to these we add the discovery of oxygen by Priestley, and of the composition of water by Cavendish and Watt, what then becomes of its claim to originality?" D.

From the Journal of the Franklin Institute.

INVESTIGATION OF THE COMPARATIVE MERITS OF THE PERPENDICULAR AND RADICAL PADDLE WHEELS FOR SEA-GOING VESSELS. By B. F. Isherwood, Esq., Chief Engineer U. S. Navy.

The perpendicular (sometimes called vibrating) paddle wheel whose paddles enter and leave the water perpendicularly, has never been introduced into this country, though extensively used in England and France, both in government and private steamers. The object of this arrangement of the paddles is to avoid the loss of labor by the oblique action of the common radiating paddle wheel. While, however, effecting this object, which is done by the combined movement of an eccentric and a number of jointed levers, it causes another loss of labor from the frictions of the eccentric strap, and the joints of the levers, and this friction amounts to a very considerable per centage, as will readily be appreciated when it is considered that action and reaction being equal, there is sustained by the acting paddles of a paddle wheel the same pressure that is sustained by the steam piston of the engine.

* Its application was first suggested by Bergmann, who was born in Sweden, in 1735, and died 1784.

which same pressure is sustained also by the various journals transmitting the power of the steam piston to the vessel. The mean of many experiments made to ascertain the friction of metal on metals with lubrication, has been found to be about ten per cent. of the pressure. But in the case of the steam engine, the pressure is not a static but is a dynamical one; that is, it is composed of pressure and the velocity at which the pressure moves; but this product expresses also the power of the engine, wherefore, the friction of the load, that is, of the reaction of the vessel on the journals transmitting the power of the steam piston to the vessel, is one tenth of the power; and, as before stated, action and reaction being equal, the acting paddles sustain this same pressure, and in the perpendicular paddle wheel they turn under this same pressure; wherefore the friction will be as before, one tenth of this pressure; that is, one tenth of the total power developed by the engine. That this is correct will be demonstrated from the experimental data hereafter examined. Now, the losses of labor by the common paddle are slip and oblique action, and as has already been stated, the losses of labor by the perpendicular paddle wheel are slip, and the friction of its moving parts, in addition to which there is a further serious loss by reaction when the horizontal speed of the entering perpendicular paddle is less than the velocity of the vessel, as will be explained hereafter. But slip being entirely dependent upon surface of paddle, it is evident that whatever slip can be given to one wheel can be given to the other, using the proper quantity of paddle surface for that purpose. The comparison is then narrowed down between the loss by oblique action of the radiating paddle wheel, and by friction of its moving parts and reaction of the perpendicular paddle wheel. The loss of labor by the friction of the paddle surface on the water, and by the direct resistance of the paddle edges, may be considered as equal in the two wheels; and is, moreover, too small an absolute quantity to be considered in a general calculation.

The best arrangement of paddle surface for the common radiating paddle wheel, is evidently to make it as long and as narrow as possible, and to make the dip edge of the paddle coincide with the surface of the water. This arrangement for minimum narrowness reduces the slip to the minimum for a given amount of surface, because the slip must be calculated for the centre of pressure or reaction of the paddle; and it is obvious that the nearer the centre of reaction approaches the outer or lower edge of the paddle, the less will be the displacement or slip; for even if the centre of reaction have no slip, that part of the paddle surface comprised between it and the outer edge of the paddle will operate a displacement.

Making the top edge of the paddle to coincide with the surface of the water, gives the minimum of loss by oblique action; for the less the immersion of the paddle proportionally to the diameter of the wheel, the less will be the vertical component of the power; because the sign of the angle under which the paddle presses the water vertically will be less.

But in practice these arrangements are wholly unattainable. In the first place, the length of paddle is restricted by practical considerations; any increase beyond a certain point is accompanied by such decreased strength in the guards, and increased weight in the wheel, as well as by the inconvenience of an excessively broad vessel, (over the guards) that the paddles of the largest sea going vessels rarely exceed eleven feet in length. The careening of the vessel also operates a depression of the leeward paddles and a raising of the weather paddle, and, taking the centre of the ship for the centre of oscillation, (not strictly true) it is evident that this depression and rise is in proportion to the distance between the exterior ends of the paddles of the opposite wheels.

This variation from a horizontal line is injurious to the economical performance of the wheels, with whose normal action it seriously interferes. The length being thus determined, and a certain area of paddle being required to propel with the desired slip, that area must be given by breadth of paddle, which has the two fold disadvantage of requiring deeper immersion to cover the paddle, thereby increasing the loss by oblique action, and

of raising the centre of reaction, thereby increasing the slip. It is moreover wholly impossible to make the top edge of the paddle coincide with the water surface, from the varying draughts of water of the steamer from the moment of starting, caused by the consumption of fuel; and from the careening of the vessel, which would, with such an arrangement, lift the weather paddle partly or wholly out of water. It may be taken as a mean with sea going vessels of medium size, supplied for a voyage of nine days and over, that the variation of draught by reduction of fuel is about three feet; to this must be added 1½ foot for careening of the vessel, and 2½ feet for depth of paddle, and we have for the least

$$(1\frac{1}{2} + 3 + 2\frac{1}{2}) + (2\frac{1}{2} + 1\frac{1}{2})$$

mean immersion $\frac{2}{2} = 5\frac{1}{2}$ feet.

Such a proportion of paddle placed on the circumference of a circle of 28 feet diameter, the paddles being about 3½ feet apart, would propel a vessel of 2600 tons displacement and 590 square feet immersed section, with a slip of about 18 per cent., and a loss by oblique action of about 18½ per cent. This loss by oblique action becoming of course less with vessels making shorter voyages, and having proportionally less variations of draught; and also with vessels having wheels of larger diameter, the absolute immersion remaining the same. We are again, however, met by difficulties in increasing the diameter of the wheel; in the first place it requires engines of longer stroke in order to avoid the too great friction caused by the leverage of the centre of reaction of the paddle on the crank pin; and in the second place, the resistance of the wheel houses to the air, the weight of the wheels, housing, etc., are serious disadvantages. In attempting, then, by means of better theoretical proportions for the radial paddle wheel than those now used in practice, to avoid certain losses, we encounter other losses and inconveniences, offsetting or exceeding the gain. It may therefore be considered as settled, that with the ordinary radiating paddle wheel in sea going vessels of medium size, making voyages of nine days and over, that the loss of labor by slip cannot advantageously be reduced below 30 per cent., nor the loss by oblique action below 18 per cent., making a total of 38 per cent. It is true, however, that the resistance of the water to displacement is greater at greater depths in the proportion of the depths. The greater therefore the immersion of a given paddle, the less will be its slip, but each increase of immersion increases the loss by oblique action, and a point is soon reached where the increased loss by the latter exceeds the increased gain by the former. To push the immersion farther than this is evidently to sustain a greater total loss.

To be continued.

English Iron Market by the last Steamer.

Liverpool.—Our market for Scotch pig iron is rather inactive, and the quotations for mixed numbers is 43s.; Gartsherrie No. 1, 44s. Sales have been made at 3d less. Bars in Wales at £4 12s. 6d., with few transactions.

Birmingham.—No further improvement has taken place here during the past fortnight; indeed, within the last few days the iron market, both at this town and at Wolverhampton, has been rather flat than otherwise. The accounts from London also are of a very quiet character, but from Glasgow, Manchester and Liverpool they are rather more promising; at the latter the minimum prices at which orders can now be placed are considerably in advance of those at which late contracts were delivered. We find upon the most accurate inquiry that throughout the whole of our great iron producing districts, scarcely any of the mills and forges are working to more than half their capabilities, and by far the greater portion not to the extent, while some are altogether closed; and yet it is considered that in manufactured iron the make is scarcely reduced within the demand, particularly as the export trade, after the late activity, begins again to show symptoms of repletion. In pig iron but little has been doing. The most needy sellers relieved themselves during the late slight impulse, which has, however, proved of short duration. Manufacturers generally have now made their purchases, and those who might be inclined to speculate seem not to have sufficient confidence to con-

sent to the figure required. It is a question that is very generally forcing itself upon the attention of thinking men interested in the trade, why it should be the case that with every prospect of an abundant harvest, with an export trade of the most expansive dimensions, with money abounding and discounts unusually low, with commercial facilities and circumstances the most advantageous, and with an appearance at least of prosperity of almost every other trade, that of iron alone should remain in a condition so utterly lifeless and unremunerative.—The discussion of this question would exceed the limits and intentions of these articles, but its consideration might afford profitable employment for some of the time and talents of those to whose guidance the trade is accustomed to look in periods of difficulty. If the cause of this anomalous prostration could be clearly discovered and defined, surely some suitable and adequate remedy could be devised. At present a large and most important interest seems to be in jeopardy from some unknown or unacknowledged cause, and the whole of the mining operations and other engagements of the district are suffering from its depression.—*Birmingham Gazette.*

British Association for the Advancement of Science.

On the Value of the Gaseous Escape from the Blast Furnaces at the Ystafra Iron Works.

Mr. Budd stated that, since the meeting of the Association at Swansea, he had continued, and with increased success, to apply the waste gases that had escaped from the top of blast furnaces, to the manufacture of iron; and it was the result of his further experience applied to the whole of his furnaces (nine in number) since that period, that he now wished to submit to the Section. Mr. Budd then referred to his mode of applying the gaseous escape, and said it was well known that there were two descriptions of furnaces used for metallurgical purposes. The one was the blast furnace, into which air was injected, by mechanical means, at a great density, so as to penetrate upwards of 40 feet of dense materials: and the other was the reverberatory furnace, where the fire was produced by means of the draught of a chimney stack. What he had accomplished was by combining these two, so that the gaseous products of the furnace, instead of escaping through the tunnel head, were drawn sideways by a high stack, and passing through the stoves and boilers, leave behind the necessary temperature of the blast and of the steam. In a blast furnace the ores are smelted before the tuyeres by the conversion of the solid carbon into carbonic acid, which, passing up through the middle region of the furnace into a bath of carbon, was reconverted into carbonic oxide, capable of combining with a further dose of oxygen. It would be thus seen that the whole of the carbon of the fuel should be present at the top of the furnace in a gaseous form.

When the British Association met at Swansea, he had not used the gaseous escape at any great distance from the furnace, his stoves and boilers being very closely contiguous. Further experience, however, had proved that, by the aid of a stack at the end of the chain of sufficient dimensions, the gaseous escape from the furnace might be made to travel in the most tortuous directions, descending to the stoves built for heating by the usual fireplaces, and traversing the boilers; the only condition absolutely necessary being, that there should be an unbroken communication with the high stack at the end, into which the gaseous escape might at last pass, and by which it was drawn forward, instead of passing off wastefully at the tunnel head. When, however, the draft was carried downward, and to long distances, he had found it necessary to drop into the top of the furnace a hopper or funnel, made of sheet iron, which acted as a shield at the mouths of the horizontal flues, and prevented them from either being affected by high winds, or from being choked up by materials thrown into the furnace. The reason, no doubt, why this funnel was not applied before, was the great apparent temperature at the funnel head. In practice, however, it was found that, until the gaseous escape mingled with the atmosphere, its heating power was not such as to injure sheet iron, or even to make it red hot. In fact, so long as there was an escape upwards, the iron fun-

nel would not be injured. The damage arose during and after stoppages of the furnace, when the blast was obstructed in its passage upwards by the settlement of the materials in the furnace, so that the atmosphere rushed down to meet the ascending gases, and, of course, caused a very high local temperature. His practice was to exclude the atmospheric air as much as possible. The affinity of the gases for oxygen was so great, that the air leakage raised the temperature quite sufficient for safety, while the full combustion of the gaseous escape would melt down the bricks in the flues, and destroy the texture of the iron tube. It was not possible for him to say what combinations took place at high temperatures, where carbonic oxide, carbonic acid, hydrogen, and nitrogen, were mixed in such proportions. At any rate, he found a smothered combustion to be the most suitable and economical for the purposes in view. He was happy to say, that at length the application of the gaseous escape had been tried in Scotland; and that at Dundee and elsewhere it was now in successful operation. The peculiar quality of the furnace coal of Scotland being what was called in South Wales "free burning," which, when put into the furnace raw, coked sufficiently in its descent, gave out an enormous escape, so much so that, upon a rough estimate, he calculated that the waste from one furnace in Scotland was sufficient to heat the blast, and to raise the steam for three. With anthracite coal, the minimum effect was obtained, as it was a dense fuel of nearly 95 per cent. of solid carbon; but in Scotland there would be an enormous surplus at the tunnel head. He observed that the saving at the Dundee Iron Works was stated to be about 1½ ton for each ton of iron produced. Supposing, therefore, 600,000 tons of iron to be the produce of Scotland, and supposing the value of the coal used to be 3s. a ton, the saving that would thus be effected on the make of Scotland would amount to £112,500 a year; to which might be added £20,000 a year of saving in wages and repairs, which would make a total saving of £132,500, or about 4s. 5d. a ton on the produce of Scotland, which, on the present price of 44s. per ton, was about 10 per cent. on the value. If the gaseous escape could be extended to the uses of the forge, a further saving of three tons of coal would be effected—thus making, at least, a saving of 20s. a ton on all the iron manufactured into bars, sheets and rails.—*Practical Mechanic's Journal.*

Alabama Minerals.

As some evidence of the vast undeveloped mineral wealth existing in the region traversed by the line of the Alabama and Tennessee river railroad, the Montgomery Atlas publishes the following list of specimens collected by Mr. J. P. Parham, while passing through the country on business connected with the road. These specimens are designed for the Central Masonic Institute at Selma. They are as follows

Marble.—Sixteen varieties, among them rare black, white and blue; black with white stripes; white with black and blue stripes; white with pink cloud; dove colored; a beautiful shell marble; magnesian marble, and a great many variegated kinds, including every shade and color.

Stone.—Soap, grind and whetstone, hone and granite. Also, two specimens of lithographic stone, one from Benton and the other from Talladega.—This is a rare and valuable stone, found only in Germany, we believe, until the discovery of these quarries.

Manganese.—Several specimens. This mineral enters largely into the manufacture of flint glass. It is also used in bleaching linen and cotton goods preparatory to printing. It is considered indispensable to many branches of the arts and manufactures. When pulverized and made into a paste with linseed oil, it spontaneously inflames. It is worth about \$40 per ton, and is said to be abundant.

Iron Ores.—Dye-iron, pipe, needle, fossil, and magnetic ore; a great many specimens of the brown hematite, which yield a greater quantity of metallic iron than any other. It is soft and tough, and the most valuable for boiler plates, and all other kinds of sheet and rolled iron.

Galena.—Three specimens of Galena or lead ore. One from Bibb, one from Benton, and one from Marshall. These mines are said to be inexhaustible. The ore is certainly very rich.

Mr. P. had some other gatherings which he thinks of more importance to the curious than they are to the commercial interests of the state. Alabama certainly possesses mineral treasures enough to amuse, instruct, and profit every citizen of her wide domain.

State Debt of Pennsylvania.

The following statement shows the state and amount of the various loans to the State, and which now constitute its indebtedness, as furnished by the Auditor General of the State.

Loan per act of	April 2, 1821	.....	\$626,951 89
"	April 1, 1821	.....	295,461 15
"	April 9, 1827	.....	999,311 15
"	Mar. 24, 1828	.....	1,998,407 09
"	Dec. 18, 1828	.....	798,474 64
"	April 22, 1829	.....	2,197,849 55
"	Dec. 7, 1829	.....	50,000 00
"	Mar. 13, 1830	.....	2,993,395 47
"	Mar. 30, 1831	.....	209,096 48
"	Mar. 30, 1832	.....	2,348,777 64
"	April 15, 1832	.....	300,000 09
"	Feb. 16, 1833	.....	2,540,010 50
"	Mar. 1, 1833	.....	200,000 00
"	Mar. 27, 1839	.....	525,922 74
"	April 9, 1833	.....	120,000 00
"	April 5, 1834	.....	2,265,059 75
"	April 13, 1835	.....	959,540 79
"	Jan. 26, 1839	.....	1,195,927 92
"	Feb. 9, 1839	.....	1,278,375 99
"	Mar. 16, 1839	.....	100,000 00
"	Mar. 27, 1839	.....	469,679 22
"	June 7, 1839	.....	40,998 25
"	June 27, 1839	.....	1,134,332 70
"	July 19, 1839	.....	2,053,933 42
"	Jan. 23, 1840	.....	860,073 13
"	April 3, 1840	.....	860,680 89
"	June 11, 1840	.....	1,039,583 65
"	Jan. 16, 1841	.....	800,000 00
"	Mar. 4, 1841	.....	22,339 06
Loan (relief,)	May 4, 1841	.....	752,664 00
Stock loan,	May 5, 1841	.....	565,875 95
"	May 6, 1841	.....	903,048 20
Int. certificates,	July 27, 1842	.....	44,681 60
"	Mar. 7, 1843	.....	83,496 54
Stock loan,	April 29, 1844	.....	59,551 46
Int. certificates,	May 21, 1844	.....	82,611 38
Stock loan,	April 16, 1845	.....	4,489,463 79
"	Jan. 22, 1847	.....	62,500 00
"	April 11, 1848	.....	135,214 00
Total amount of loans		.....	\$40,366,803 75

Railroad for Sale.

The trustees, under an act of the Pennsylvania Legislature authorising the sale of the Franklin railroad, advertise at public sale so much of the road as lies in that state, a distance of 15 miles—the sale to take place in Chambersburg on the 25th of October next.

Growth of Milwaukee.

The census of Milwaukee shows a population of 20,035, a gain of 6,000 in a little over two years. The Sentinel thus exults, and with good reason:

Looking back a few years, the growth of Milwaukee appears almost fabulous. In 1836, only sixteen years ago, Solomon Juneau was the sole white male inhabitant of the town. In the Spring of that year, the first frame building was put up here. Even in 1840, but ten years ago, Milwaukee could only number about seventeen hundred inhabitants. and now she has over Twenty Thousand. Is there a city in the United States of which the same can be said?

As the best illustration of the rapid growth of our city, we give the returns of the different enumerations from the start up to June of this year:

Year.	Population of Milwaukee.
1834	1
1840	1700
1842	2900
1846, June	9508
1847, Dec.	14001
1850, June	20035

From the Glasgow Practical Mechanics' Journal. Improvements in Forging Iron.

BY JAMES NASMYTH, ESQ.

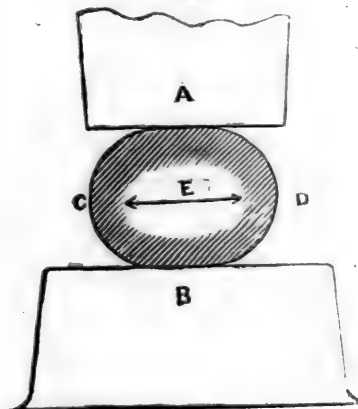
[The importance of this paper, in connection with workshop practice, is, we presume, sufficient to render unnecessary any apology for giving it a more prominent position than it would occupy in our usual report of the proceedings of the British Association.—Ed. P. M. Journal.]

Before proceeding to describe the nature of these improvements, Mr. Nasmyth made some remarks on the value and importance of any contrivance which tended to increase the certainty of the production of sound and perfectly solid forgings of wrought iron, more especially those massive forgings required for such purposes as paddle shafts for marine engines, crank and plain axles for locomotive engines, anchors, and such like, on the soundness of which both life and property, to a vast amount, may depend, and instanced several cases in which paddle shafts of marine engines had given way, although, in the first instance, they had all the outward aspect of the most perfect soundness. On fracture, however, they exhibited the existence of original defect, in being little else internally than a mass or bundle of loose bars of iron which had never been in a sound welded union, but had only been held together by the exterior, where alone the welding had been so far perfect.

The chief cause of such defects was traced to the action induced on the central part of the metal, by the action of hammering such cylindrical forms between two flat surfaces, as in the case of a forge hammer and anvil of the ordinary construction.

Mr. Nasmyth exhibited the diagram, fig. 1, in

Fig. 1.
Hammer.

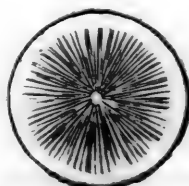


Anvil.

order to illustrate the action induced on the central portion of a cylindrical forging, when produced under the action of a flat-faced hammer and anvil.

It will be seen at once, that the effect of the successive blows of a flat-faced hammer and anvil, as A and B, is to cause the work to spread out or extend in the direction, E D, E C, as presented by the double pointed arrow in the figure; and as the flattened-out form has to be attempted to be corrected by turning the shaft round and round on the anvil, so that each successive blow may be made to correct the spreading out caused by the previous blow, the result of this action is a fretting or mincing of the central part of the metal of the shaft, resulting in a separation of the metal throughout the entire central portion of the shaft, somewhat after the manner indicated in fig. 2, frequently to such

Fig. 2.



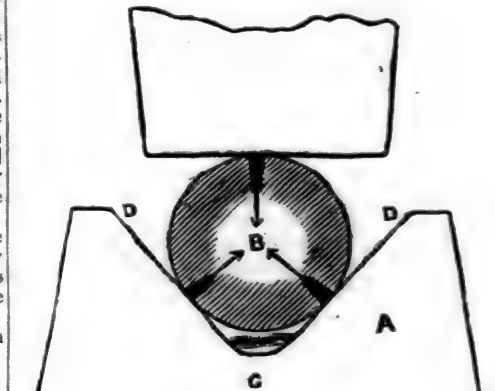
an extent as to permit the passage of air or water from end to end of shafts forged in this manner.

The effect of this kind of unsoundness is, that it is certain, sooner or later, to work out towards the exterior, and, in all probability, results in "a break down," more or less disastrous in its consequences.

Mr. Nasmyth then proceeded to describe his improved form of anvil-face, by the employment of which all such defects as detailed above are avoided. Such has been the perfect success and excellent results which have attended the use of this anvil-face, that its adoption has become almost universal, and the production of absolutely sound, solid, wrought iron shafts, of whatever magnitude, rendered equally easy and certain.

A, fig. 3, represents the form of the anvil-face,

Fig. 3.
Hammer.



Anvil.

which he terms a V anvil, and between the jaws of which the work to be hammered is placed, as indicated by a cylindrical shaft, seen in section, marked B. A glance at fig. 3 will no doubt render its action evident, namely, that the action of each blow of the hammer on the work, C, instead of causing, as in the case of fig. 1, a diverging action on the central portion of the work, occasions, on the contrary, a converging action, as presented by the three arrows; and instead of having the central portion of the metal of the shaft rendered less compact and solid by the action of the blows of the hammer, we have quite the contrary effect. Besides this, owing to the wedge-like form and action of this V anvil-face, the compressing effect of the blow is most importantly enhanced, and the ease and rapidity with which shafts and the like can be produced by such means is most remarkable, so much so as to enable the forgerman to hammer out, at one heat, by means of this V anvil, as much as would require three heats on the common flat-face anvil. The fork-like form of the V anvil affords vast convenience in keeping the work at all times right under the centre of the hammer, as it is turned round and round to receive the successive blows, which, in the case of work of the largest class, is a matter of no small trouble. Another advantage consists in the free passage, or exit, which is at all times preserved for the escape of the scales and impurities falling from the hot iron during the process of hammering, and which scales fall down towards the apex of the V at C, and trickle away, thus removing the cause of blemish and roughness, caused by such scales collecting on the face of the flat anvil, and getting beaten into the surface of the forging.

It will be seen on inspecting fig. 3, that one such V anvil-face will accommodate a vast range of diameters of work; namely, all diameters such as will neither absolutely rest on the bottom of the apex, C, or on the corners, D D.

The inventor stated that an angle of 80 degrees was found by him to be most generally suitable for the inclination of the sides of the V, and also that the edges should be well rounded off, and the surface of the V sides curved in the direction of the axis of the work to the extent of 1/4th of an inch in 12 inches, to facilitate the extension—axis ways—of the work.

To be continued.

Vermont.

Connecticut and Passumpsic Railroad.—Rapid progress is now being made towards the completion of that part of the line of this road from Wells river to St. Johnsbury; and it is expected that it will be opened for travel in November next. The whole length of line then completed will be sixty miles.

The means for the extension were obtained on the bonds of the company, which were voted at the annual meeting in 1849, to the amount of \$550,000. These have been negotiated at par. The estimated cost of the division in progress, 30 miles, is 500,000 dollars. It is believed that the extension will add largely to the business of the road, and improve the value of the stock. It penetrates a fine agricultural region, in which are important manufacturing establishments, the most extensive of which are the celebrated works of E. & T. Fairbanks & Co. It will prove a very attractive route to the pleasure traveller and tourist. We presume that a movement will be made to extend it to the Canada line, as soon as the St. Lawrence and Atlantic reaches that point; so as to open a direct communication between Boston and Montreal.

The present capital stock of the company, including interest and dividends due stockholders, and divided among them in stock, is as follows:

10,864 shares.....	\$1,086,400 00
Amount paid on 127 shares forfeited.....	1,509 22
Bonds issued.....	550,000 00

\$1,637,909 22

The total amount expended on account of the road has been.....\$1,323,039 24

The receipts for the year ending May 31st, 1850, were.....\$113,957 33

Expenses during the same time..... 50,930 38

Leaving as net earnings.....\$62,026 95

The above has been one of the best managed and most fortunate of the interior New England railroads. The company at no time have lost the control of their own affairs by going beyond their means. It has retained the confidence of the public, and this has enabled them to negotiate their securities on the most favorable terms. It occupies one of the best railroad routes in New England, the valley of the Connecticut, and there appears to be no doubt felt of its being able to pay a dividend of at least six per cent. annually to its stockholders.

South Carolina.

Greenville and Columbia Railroad.—We have received the third annual report of the proceedings of the stockholders of this company at a meeting held at Newbury on the 10th of July last. The line of this road extends from Columbia via Newbury and Anderson to Greenville, and including a branch to Abbeville is 164½ miles long. The whole cost of the road and equipment is estimated at \$1,384,876 74. The whole amount of means provided for its construction is \$1,178,000, leaving only about \$200,000 yet to be obtained. The iron for nearly the whole road has been secured; in part by a contract with the South Carolina railroad for iron formerly used by that company, sufficient to lay 100 miles, and by purchase in England for 54 miles. It is expected that the portion of the line extending from Columbia to Newbury will be completed by the first of November next. Twenty-four miles, from Columbia to the crossing of Broad river are already in operation, and contracts for grading the whole line have been made. This part of the road will be completed probably before the superstructure can be had on the ground, as a large part of it

will have to be transported for a long distance for some portions of the line. All the usual necessary steps, such as providing suitable depot grounds, etc., for the use of the road, have been taken, and the company are now actively and unitedly engaged in the vigorous prosecution of this great work, with sufficient means for its early completion.

The completion of this work will carry railroad accommodations to the extreme parts of the State. Companies have been organized for the purpose of constructing branches from Laurens, and from Spartansburg and Union, to connect with the above near Newbury. The completion of these lines, with other projects in progress in other parts of the State, will give to South Carolina advantages of transportation scarcely excelled by any State in the Union, certainly by no Southern State. Every part of her wide and fertile territory will have easy access to a market at all times, and all her means of wealth will at once be brought into notice and use. Those engaged in the construction of her public works fully appreciate their importance in increasing the value of property, and improving the condition of the whole community, and they enjoy a double reward of their labors, in the consciousness of conferring a substantial advantage upon their neighbors as well as themselves. Where a railroad is regarded in the light of a public benefit, those entrusted with it are sure to labor with a zeal and disinterestedness which we never witness in a project which has in view private ends alone. The spirit manifested by the directors of this road is a good illustration of this truth. The officers of the company for the present year are Hon. John B. O'Neill, President; William Patton, Danl. Blake, J. S. Preston, D. Nance, S. Fair, F. G. Thomas, T. C. Perrin, Joel Smith, J. N. Whitner, J. P. Reid, V. McBee, Josiah Kilgore, directors; W. Spencer Brown, Chief Engineer.

The York and Cumberland Railroad.

Mr. Hambly has resigned the office of president of this company, and Eli Lewis, Esq., of York, has been elected President in his stead. Whilst it is to be regretted that there should have been any cause for the resignation of Mr. Hambly, it is a matter for congratulation, among all concerned in the prosperity of the road, that the choice of the directors should have fallen on Mr. Lewis. He is well known to a large body of our citizens, among whom he lived for many years, having for a long time been associated in the editorial department of this paper, previous to 1841, when he accepted the office of Treasurer in the Post Office of this city. He subsequently removed to York, where he has been residing ever since. On the organization of the York and Cumberland railroad, he was elected treasurer of the company, and now has been chosen president of it. Integrity, high ability, and persevering industry, have ever distinguished him in every station he has filled, and these will be sure to make his administration of the road eminently successful and satisfactory to the public.

The road is now nearly completed, and the cars will be run over it in a few weeks.—*Baltimore Patriot.*

Pennsylvania.

Ohio and Pennsylvania Railroad.—At a meeting of the board of directors of the Ohio and Pennsylvania railroad, held in this city, last week, the grading and masonry of the remaining sections, nineteen in number, between Massillon and Wooster, were put under contract. The work on this distance of 19 miles is generally light, and it has been let at rates considerably lower than the estimate of Solomon W. Roberts, Esq., the Chief Engineer.

The work is now under contract in a continuous line to Wooster, a distance from Pittsburgh of 132 miles; and a vigorous effort is about to be made in Ohio, to raise the amount of stock yet required to

complete the grading and bridging from Wooster to the western terminus of the road at Crestline, near Gallion. The distance is fifty-three miles through a very favorable country, requiring no heavy work, on a line with light grades and curvatures, having a maximum grade of about twenty five feet per mile.

The line lies in the counties of Wayne, Holmes, Ashland, and Richland. Persons living on and near the line have already subscribed about half the amount required, and the citizens of those counties are about to be appealed to for the sum remaining to be taken, being about one hundred and thirty thousand dollars. As soon as they do this, it is the intention of the board to put the whole work under contract, and to complete it next season ready for the rails, so that our western railroad may be finished as soon as the central road.—*Pittsburg Gazette.*

Railroad Projects.

An association has been formed to construct a railroad from Gallipolis to Chillicothe. The last Ohio Legislature passed an act of incorporation to that effect. The road is intended to connect with a railroad through western Virginia to tap the Ohio at the mouth of the Kanawha, which it is believed will ere long be constructed. This would give a continuous railroad from Chillicothe east. When we take in connection with these projects a railroad from Lexington to Maysville, we have when these roads are completed, a continuous railroad communication between this and the eastern cities, excepting about 6 miles, from Chillicothe to Maysville.

While upon this subject we may state that the city council of Lexington has unanimously expressed itself in favor of the Maysville and Lexington road, and as soon as the estimates are completed that body will authorize a vote of the citizens to be taken, in accordance with an act passed by the late Legislature, on the question of subscribing \$150,000 by the city for the road.—*Louisville Journal.*

Railroad Law.

In the proceedings for an injunction against the Hudson River Railroad by Hamilton Wilkes on the ground that in assessing damages for lands taken, the company had proceeded under their charter instead of under the General Railroad act.

Judge Edwards has decided that the charter called for three commissioners, whose residence and the mode of nomination were not fixed. The general act for five, who should reside in the country where the lands lie, two from the nominations of the land holders, a like number from the nomination of the company, and the fifth by the court.

The court held, delivering an able opinion, that the mode of fixing the damages provided by the charter, stood unaffected by the General Act.

The injunction having been denied, the company will of course proceed with the construction of the road over the lands acquired under these proceedings from Mr. Wilkes, without further interruption. The same order was also made in the case of Mrs. Margaret Livingston.

New York.

Harlem Railroad.—The New York Tribune states that a contract has been made for the extension of this road to the Western road with Messrs. Geo. L. Schuyler, Sidney G. Miller of New York, and Governor Morris of Morrisiana, who agree to complete the road for two millions of dollars, which they are to receive in certificates bearing 7 per cent. interest. These certificates are a lien upon the new portion of the road, and upon that only, and have no claims upon the earnings of the old road for interest. The Harlem company is to run its equipage over the new road when completed,

the expenses of such working to be paid from the receipts of the new road. The surplus earnings of the new road after deducting expenses, are to be devoted to the payment of the interest on the two millions of certificates issued as above. Should this surplus be insufficient for the payment of such interest, then the receipts from the old road, from the business derived from the new road, are to be refunded to the extent of three-fourths, for the purpose of making up such deficiency. Twenty-two miles of the new road are to be completed by the 4th of July, 1851, and the remainder to Chatham, by the 4th day of July, 1852. One million of the certificates are convertible into stock of the Harlem railroad company at par, any time within five years of the completion of the connection with the Western road. The agreement also provides for the sale of the new portion of the road in case the interest on the certificates is in arrears for two years, or in case the certificates are not paid off at the end of twenty years. The arrangement is a very favorable one for the Harlem road, and is in effect that it obtains a connection with the whole web of northern roads, from which to draw business without being required to provide any funds to make such connection, or to become liable for any interest in the cost of such extension, and it has the privilege at the end of taking the entire road at cost.

The Whitehall and Rutland road is completed and an engine will run over the road on Tuesday next to Castleton, a few miles from Rutland, which is the terminus of the Whitehall and Rutland charter. The link between Castleton and Rutland is being built by the Rutland and Troy company, and will be completed in about a fortnight, when New York will have a direct and rapid connection with Rutland.

The Dunkirk Journal says: The work on this end of the western division of the New York and Erie railroad, is rapidly progressing. From this place east, several miles of iron are already laid, and the superstructure of about ten miles more will be ready for the iron during this fall.

Buffalo and State-line Railroad.—The Fredonia Censor states that the whole line of the Buffalo and State-line railroad is under contract—from Buffalo to Lagrange, to Asa Wood & Co. of Buffalo; from the latter place to Fredonia, to Hays & Co. of Rochester; from this place to near the line of the town of Ripley, to Cook McDonald, of St. Catharines, Canada, and from that point to Pennsylvania, to Messrs. Leet & Ely. The contractors are to have the work ready for the superstructure by the 1st January next.

Michigan.

Southern Railroad.—The extension of this road westward is rapidly progressing. The cars now run regularly to Jonesville; and the villages of Hillsdale and Jonesville are now united by iron bands. The work is rapidly advancing, and in a few weeks we shall be able to greet our Coldwater friends and compliment them on their increased facilities for travel and business.

A ride over the road to Jonesville will satisfy any one of the great superiority of the T rail over any other kind. The road as far as completed gives evidence of the energy of the company and fidelity of the contractors. With the fare between the two villages at a shilling, it will insure a cheap and pleasant medium between their citizens. We cannot omit testifying to the gentlemanly deportment of the conductors upon this road.—*Hillsdale Gazette.*

Georgia.

Muscogee Railroad.—The Columbus Times of the 27th inst. says: "The board of directors at a meeting last week, passed an order for the purchase of locomotives for this road. The contractors are making good progress in grading and getting good timbers for the superstructure. It is expected that by the month of April, thirty miles of the road out of Columbus, will be ready for the

cars. The section beyond the Flint river are now in process of location; and a large force will be put on them in November. We can thus see the end of this enterprise, and count safely upon a steam carriage from Columbus to Macon, in a little over twelve months."

Ohio.

Junction or Lake Shore Railroad.—The Sandusky Clarion says that "a meeting of the directors of the Junction railroad company was held at Elyria on Thursday last. A spirited competition existed among those favoring the different lines. The directors, after comparing advantages and offers, selected a route, beginning near Olmstead Falls, 13 miles west of Cleveland, and running by Elyria to Sandusky, and from thence to Toledo by Fremont, provided a satisfactory subscription should be made. All intermediate points remain open, but the route which appears the most favorable is by North Amherst and the lake shore.

The executive committee were directed to prepare the line for letting and to begin work at the earliest practicable period. A favorable contract for the whole line was offered, and is under consideration, and affords reason to expect the commencement of operations in a few days."

We learn that the distance from Cleveland to Toledo by the lake shore route is 110½ miles, and that the estimated cost per mile is \$17,382. The line will be run straight, the grade low, and altogether the route is remarkably feasible.

The common council of Cincinnati have recently recommended the granting of the following loans to internal improvement companies:
Ohio and Mississippi railroad via Lawrenceburg.....\$600,000
Cincinnati and Lexington, Ky., railroad.. 100,000
Eaton and Cincinnati railroad..... 150,000
Belpre and Cincinnati railroad..... 150,000

Total.....\$1,000,000

Railroad from Chillicothe to Gallipolis.—A company has been organized under a charter, to construct a railway from Chillicothe to Gallipolis through Jackson, designed as a connecting link between the Virginia works which terminate at the mouth of the Kanawha, and the Belpre and Cincinnati, and the Scioto and Hocking Valley roads terminating at Chillicothe. The distance from Chillicothe to Gallipolis is 65 miles, and the Scioto Gazette assures us that 45 miles of the line are in the richest mineral region of the Valley of the Ohio. The whole line, it is said, is more favorable than is the Great Western line from Boston to Springfield, in Massachusetts.

Indiana.

We learn from a person that came down the line of the Bellefontaine road, that the iron cars will run this evening to within about a mile of Pendleton, and that the company expect to have the iron laid on the main track, and the switches and turn outs made complete next week; so as to put the first general section of the road of 28 miles from the Madison depot, at Indianapolis, in full operation by the first of October. This proves the energy and force that has been thrown upon the work this season. The union track has been completed, and this road has been laid with the heavy T rail and ballasted, carrying the gravel by steam power about twelve miles from the pits at extreme points. We further learn that the company expect to run the cars yet this season 8 miles further to Anderson.—*State Sentinel.*

The State Sentinel says: "We are informed that the railroad meeting held last Saturday at Hagerstown, Wayne county, resolved to organize a company, and proceed at once to locate the road

from Richmond, through Washington, Hagerstown and Newcastle to Pendleton, intersecting at that point the Indianapolis and Baltimore railroad. The distance between Richmond and Pendleton on this route, would be about nine or ten miles less than that between Richmond and Indianapolis on the direct route, and would increase between Indianapolis and Richmond some seven miles over the Cumberland road line."

Railroad Subscription.—The register, at South Bend, Ia., says the county commissioners have agreed to subscribe \$40,000 to the stock of the Michigan Southern railroad.

Jeffersonville and Columbus Railroad.—This road running from Jeffersonville opposite Louisville to Columbus, intersecting the Madison road about 40 miles from our city, is under the Presidency of Wm. G. Armstrong, Esq., of Clark county, whose energy of character alone would insure its construction, besides we understand that it is progressing steadily to completion. This road must prove highly important as a direct connecting link between Louisville and Indianapolis, and ultimately between the cities at the Falls of the Ohio, with their connecting links from Kentucky and Tennessee and the Atlantic cities. When this road shall be completed, it will be only six hours from Louisville to Indianapolis, eighteen hours from Louisville to Sandusky, twenty hours from Louisville to Cleveland or Pittsburgh, thirty three hours from Louisville to Philadelphia, thirty seven hours to New York, passing through Indianapolis, and running over the Bellefontaine, Ohio and Pennsylvania line.—*State Sentinel.*

Monopoly of the Right of Way.

The Erie Gazette, in an article upon the railroad in progress from that town to the New York State-line, to connect with the New York and Erie railroad, takes the following ground in relation to the extension of a railroad west of that place:

"This road, so grand in conception and so vast in result, we would convert not alone to our general, but to our particular benefit. Having the power, we need only the disposition to do it. As our contemporary of the Observer has remarked, our county 'holds the key to the great western world, and can turn the lock so as to forever shut off an eastern railroad connection with that world, if she chooses.' Will we not exercise this power firmly, fearlessly and judiciously, unimpaired by the menaces of blustering corporations abroad—unseduced by the gilded bait of dollars and cents. A golden opportunity is now presented—the last, we fear, that will ever be offered of building up Erie, and placing her in a position of honorable and independent rivalry with other cities. Let us, as citizens, wake up from our lethargy, our culpable indifference, upon this important subject. Let us take a deeper interest in it—let us speak out boldly and fearlessly, and determine that foreign influence shall not assume and maintain the direction of an important thoroughfare through our county. Let us show a truly loyal spirit, and resolve that Erie shall be something more than a 'watering place' on the great lake shore iron-horse course."

So, then, Erie is to constitute herself an impassable wall, which is to forever cut off all connection between the railroads of New York and New England, amounting to an extent of line of 4,000 miles, and those of the west. For the benefit of the Erie people the distance from that place to the Ohio State-line is to be passed over both by passengers and freight by the old mode of conveyance; and a tribute, in the shape of the increased expenses of travel, is to be paid by the greater portion of the business men of the country. Erie, by virtue of her position, is going to tax every man and every pound of freight, that must pass through that town. The ground taken by this place is a most striking

illustration of the necessity of free railroad laws in every State. The doctrine here asserted, if carried out, would put a stop at once to the whole internal commerce of the country. In the end, to be sure, it could not be sustained in any case, against the united sentiment of the whole community, but until public opinion could exert its corrective influence, great annoyance and inconvenience might be suffered.

There is another remedy for this violation of popular right more effectual, but which honorable men would hesitate to make use of—that is, to buy it off; for, it may be laid down as a fixed fact, that those who are unprincipled enough to make it up on purely selfish grounds, are venal enough to have such opposition quieted for a price.

AMERICAN RAILROAD JOURNAL.

Saturday, September 25, 1850.

How to Cure Diseased Politicians.

The subject of party politics does not properly come within the scope of our paper, but in looking over our exchanges, something beside railroad matter will occasionally meet the eye; such, for instance, as the loud complaints which are uttered by the South at the aggressions of the "Northern barbarians," and the threats of disunion which are now so common in that quarter. By far the largest part of these complaints and threats, we believe to be the stock in trade of political aspirants; who, to bring themselves into notice, adopt the hyper-superlative in action and speech, just as ultra abolitionists at the North do, for the same object. These tricks on both sides are pretty well understood, and excite but little attention or concern on the part of the community. But we are bound to believe that in both parties there are some sincere persons who are really convinced of the truth of all they say. In the North, where political ideas connect themselves with the religious views of a person, we frequently find a very great pitch of fanaticism; but upon purely political subjects, the South outdoes us completely. The reason of this is very obvious. With us, our greater facilities for social intercourse, has a strong effect to correct and soften individual idiosyncrasies: and the busy and active business habits of our people, allow but little time or opportunity for metaphysical speculations. And hence at the North we are more moderate in the expression of our opinions, simply because conviction with us is less intense than at the South. The Southerner does not enjoy these correctives to the same extent. The planter is comparatively isolated from the world. By fortune of birth, very like, his position and pursuits in life are determined. In business affairs he has little to do, but to jog along in the same track that his father followed. He has ample time for study and speculation, and in pursuing the bent of his own inclination, he has no corrective in the circumstances by which he is surrounded to prevent him from running to an extravagant pitch. He lives in his own ideas. His mind reacts upon itself, increasing the intenseness of his own convictions; so that when he comes into public life, he presents a marked contrast to the sober, plodding, calculating Northerner. The former, therefore, is bold, and emphatic, and states his view in formulas, which are as rigid and precise, as if they were used to express a mathematical truth; and is governed as much by them in the one case as in the other. The greater experience of the Northern man teaches him to state things hypothetically, as experience has taught him that in

business matters, probabilities on either side always very nearly balance each other, he carries the same cautious mode of reasoning into his political speculations. With him

"The native hue of resolution is
Sicklied o'er with the pale cast of thought."

So that if the question of the dissolution of the Union were presented to him, he would deliberate so long upon the advantages, pro and con., of such a step, that the time of action would pass by long before he had made up his mind. The Southern man, from his mode of reasoning, has all these questions settled at the start. He has demonstrated them to his satisfaction, and this gives an emphasis to his conduct which we rarely witness in his more phlegmatic neighbor.

Now, as we want to see the Union preserved—or rather, since there is no danger of this, we are desirous of seeing the proper remedies adopted for the purpose of bringing the extravagance of some of the Southern hotspurs to a comfortable and quiet point, both for the peace of the community and their own good, we would suggest to the more moderate of our Southern friends, to place such persons in positions where their attention will be turned to, and occupied by, practical affairs. The advantages of such a course will be two fold. It will create a distaste for theoretical speculation, from the superior charms that an active life possesses for most men; and it will at the same time show these men that, in the present condition of society at least, theory and the operations of natural laws, are often antagonistical; that in affairs, concession must be made to both; and that he is the wisest man who has discovered the true medium, and allows to each its legitimate and proper influence. This medium can only be discovered by great observation and experience; and in efforts to find it we are often misled: and often mistake the apparent for the real. This not only begets a distrust in the correctness of our reasonings, but our observations. The most sagacious man, therefore, is the most diffident as to the correctness of his own conclusions, or rather, perhaps, the most cautious in asserting their correctness. Upon every subject about as much may be said upon one side as the other. It is the balance of evidence that turns the scale.

The application of these remarks is very easy. If a man appears to be running mad upon political topics, make him president, or a working director, of a railroad. Keep him at this employment a few years, (a longer or shorter time to meet his particular case) and by that time he may with perfect safety be allowed to return to his old employments, for the experience he will have gained will be a sure safeguard against the repetition of his former extravagances.

So much for advice. We did not think of writing ten lines when we commenced, but we did not find any stopping place till the whole was penned. On some other "convenient occasion," we will take a look at the Northern side of political extravagance, and try to find out where the balance is. In the mean time, we sincerely hope that our Southern friends will commence at once to put our advice into practice, as they may with certainty rely upon its excellence.

Land Grants for Railroads.

We are sorry to see that Congress has refused to make a grant of land to aid in the construction of the Pacific, and the Hanibal and St. Josephs railroads, in Missouri. The construction of the former would be so much accomplished toward the great line to California or Oregon. We hoped that

this consideration would have an influence upon Congress, and we now understand that the real merits of the case had but little to do with the action on the bill. We hope to see this body in better temper at its next session.

Virginia.

The people of Southwestern Virginia have recently held a convention at Wytheville, for the purpose of taking measures to provide means for putting another division of the Virginia and Tennessee railroad from Salem to Wytheville, a distance of 82 miles, under contract. To complete the road to this point, an additional individual subscription of \$200,000 is necessary. The construction of the road to Wytheville, it is confidently believed, will secure the building of the whole line.

The meeting was addressed with eloquence and effect by Messrs. Garnet, Chief Engineer of the road, W. C. Flournoy of Prince Edward county, F. B. Deane, Jr., of Lynchburg, John M. Preston of Abingdon, H. L. Brook, and W. W. Crump of Richmond, W. P. Tunstall, President of the Richmond and Danville railroad, and B. R. Floyd of Wytheville. The importance of the road, not only to Virginia, but as one of the great thoroughfares for the whole country—the influence that its construction would have in restoring to Virginia her rank among the States, in building up her seaports, in stimulating the industry of her people, and in making available her great capacities of wealth—were the principal themes dwelt upon by the speakers. The people of Virginia are beginning to feel that they can only keep pace with their neighbors by bringing into use among themselves all those contrivances which modern science and art have discovered, either to aid or supersede muscular action. It is the steam engine which now makes a nation, or a community, great, rich and powerful; and under its influence more progress has been made in the past thirty years, than in the preceding five hundred; and the people that have availed themselves of it are as far in advance of those who have not, as the latter have advanced beyond their ancestors of 500 years.

Assurances were given at the convention that the city of Richmond would subscribe \$100,000 of the sum wanted, if as much more could be obtained from the people on the line of the road. Suitable committees were appointed for the purpose of obtaining subscriptions; and our belief is, that from the spirit displayed at the convention, the necessary sum will be raised. If so, it will give a new impulse to the public improvement spirit of Virginia, and hold out great encouragement to other portions of the country engaged upon other parts of the great line of which this is an important link.

Maryland.

Baltimore and Ohio Railroad.—We learn from the *Wheeling Gazette*, that a large number of hands are now employed on the several sections of the Baltimore and Ohio railroad between that city and Grave Creek, on the contract of Messrs. McCassin, Coyle & Otterson, and that the work is progressing with a rapidity which promises the completion of the contracts within the shortest time estimated by any of the friends of this great work.

Wisconsin.

Milwaukee and Mississippi Railroad.—The *Milwaukee Sentinel* of the 13th has the following announcement of the opening of the first railroad in Wisconsin: "The first rails of the Milwaukee and

Mississippi railroad were laid down yesterday, and the first locomotive for the road arrived the same evening on the schooner Abiah from Buffalo. This locomotive is of the largest size and best pattern, weighing some twenty tons, and built in excellent style."

Virginia.

Virginia and Tennessee Railroad.—The Lynchburg Republican says that the tunnel near that place, which will form a part of the above named road, is rapidly progressing. The work has reached 95 feet, upon the north, and 55 feet upon the southwest side, making a distance already accomplished of 150 feet. Two sets of hands are employed, which regularly relieve each other, night and day, thus enabling the tunnelling to be carried on without intermission. The whole length of the tunnel will be about 450 feet, and will require until the middle of October to complete it. Along the entire line of the improvement to Salem, the progress is most encouraging to the friends of the road.

Illinois.

A friend in Illinois complains, that in an article on the railroads of that State, in our paper of the 31st ult., we did injustice to the Terre Haute and Alton railroad;—or, rather, that our saying that "we were not well informed" as to its condition and prospects, was not extending to it an equally favorable notice that we gave other roads in that State. It is true that we were not so well informed with regard to the above as the others, inasmuch as the proper officers had furnished us minute statement of the condition of each. We certainly intended no disrespect, and are happy to be able to give a statement of the condition of the above project from authentic sources.

The above company has been organized under the general railroad law of Illinois, which provides that any number of persons forming themselves into an association, and subscribing stock to the amount \$1,000 for every mile of railroad contemplated may organize themselves into a company for the choice of officers, etc. Such company may then apply to the Legislature for a charter, or for the privilege of taking the right of way for the road. Such a charter is necessary before the company can proceed to the work of construction.

These preliminary steps have been taken by the above company. The route has been surveyed by way of Bunker Hill, Hillsboro, Shelbyville, Charleston and Paris, to Terre Haute. The right to commence the work of construction will undoubtedly be granted by the next legislature. The route as may be supposed is very favorable; and a portion of it, about 23 miles, was graded by the State many years since, which will be available to this work. We hope in a few days to receive the report of the engineer, W. P. Crocker, Esq., when we shall be able to give a more detailed account of this project. This will enable us to form an opinion as to the means of the people interested in it for its construction. That railroads in Illinois will pay it bail, we have no doubt. Whether that shall be constructed or not is chiefly a question of means.

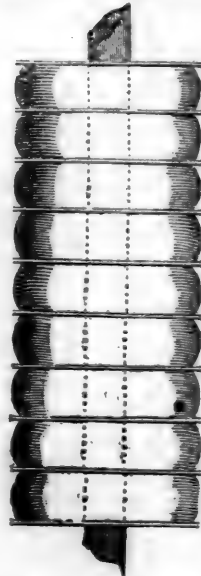
Ohio.

We understand that the survey of the Cleveland and Toledo railroad has been completed, and it is found to be a very favorable route. The maximum grade is 20 feet, and from Tremont to Toledo 28 or 29 miles, the road is a perfectly straight line.

The Cleveland, Columbus and Cincinnati road is completed to Wellington, a distance of 35 miles, and two passenger trains are running between that point and Cleveland daily. Commencing at Wellington, the surveyed line west passes near Brigh-

ton and Clarksfield, through Norwalk, Montroeville, Bellevue, Hamer's Corner's and Fremont, to Toledo, making the entire distance 78 miles.

Important to Railroad Co's and Car Builders.



THE question which for a long time has been pending before the Commissioner of Patents, involving the validity of the Patent claimed by F. M. Ray, of this city, and W. C. Fuller, of England, for the use of India rubber for Railroad Car Springs in the 'Disc' form, has been decided in favor of Mr. Ray, the American Inventor. This decision gives to Mr. Ray and his associates the sole right to manufacture and sell the India rubber Car Springs in all the varieties in use. Railroad Companies and Car Builders will please take notice of this fact. All purchases that have been made of any other persons, than said Ray and his associates, since the filing of his application, have been infringements of his patent, as well as all that may be made for the future.

To Contractors.

ALABAMA AND TENNESSEE RIVER R. R. SEALED Proposals will be received by the Directors of the Alabama and Tennessee River Railroad, at their office in Selma, until the 1st of November next, for the graduation, masonry and bridging of 56 miles of the Southern Division of said road, extending northwardly from Selma.

Plans and profiles may be inspected and specifications and information will be given at the office of the company in Selma, on and after the 15th of October next.

Twenty-six miles of this division were graded in 1839. This part of the division will require repairs to the road bed, and will be furnished anew with culverts and bridges.

The country embraced in this division is healthy, well watered, and possesses facilities for obtaining supplies of provisions.

Proposals may be based upon cash payments, or upon payments of a proportion, or of the whole of the work in stock.

The Directors reserve to themselves the right to accept or reject proposals as they may think proper for the interests of the company.

The Directors expect to have as much as twenty miles of the Northern Division, extending northwardly from the Coosa river in Shelby county, ready for examination by the 15th November, and for letting by the 1st December; and 30 miles more, ready for examination by the 1st and for letting by the 15th of January, 1851. It is likewise their intention to let out the grading, masonry and bridging of the remainder of the Southern Division and of the Northern Division terminating at Gadsden, with all possible despatch.

By order of the President and Directors.

LEWIS TROOST, Chief Engineer
Selma, Ala., August 30, 1850.

OFFICE FULLER'S PATENT INDIA-RUBBER SPRINGS, New York, Sept. 25, 1850.

IN the Railroad Journal of last week, Mr. Ray, by advertisement, made statements totally untrue; for the purpose of misleading the parties interested in the use of India-rubber Springs. With respect to the patent granted a few days since by the present Commissioner of Patents to F. M. Ray, the facts of the case are as follows:

In 1845, Mr. W. C. Fuller obtained a patent in England for the application of Vulcanized India-rubber to springs of railroad cars; and in 1846, applied and obtained a patent for the same invention in the United States. Subsequent to this, Mr. Fowler M. Ray, and his associates, obtained a patent for a spring composed of cylinders of rubber made air tight, which proved to be of no value. He then commenced infringing upon Mr. Fuller's patent, but receiving notice to desist, he applied, in 1848, to Mr. Burke, the then Commissioner of Patents, for a patent similar to that granted to Fuller, which application was promptly refused. An interference was then declared by Ray and his associates, which after consideration by Mr. Burke, was dismissed. No appeal was made by Ray, and thus ended the matter.

Mr. Ewbank succeeded Mr. Burke, and M. Keller, a very warm and influential friend of Mr. Ewbank, was employed by Mr. Ray to procure a patent. Mr. Ewbank, setting aside the decision of Mr. Burke, and against the evidence produced by Mr. Fuller, on the hearing of the case before the U. S. Commissioner, has thought fit to grant Ray a patent. Proceedings have already been commenced, and the legality of this patent will be forthwith tested in a Court of Equity, where no undue influence can reach. In the meantime Fuller's patent stands valid and untouched, and all Mr. Ray's notices and advertisements about infringements by Fuller, upon his rights, and all implied threats of prosecution against those using Fuller's springs are intended to deceive the public and defraud Fuller.—This gross attempt to deprive Mr. Fuller of his lawful rights as original inventor and patentee of India-rubber springs for railroad cars, etc., will be fully exposed in a court of law, till when, the directors of the various railroads in the United States, and others concerned, are cautioned against being misled or intimidated by any of Ray's misrepresentations.

With regard to the material of which the springs are composed, the rubber used by Mr. Fuller is made by Mr. Day, or by the Boston Belting Co., either under their own patents or that granted to Goodyear; the fact of Mr. Day having manufactured Vulcanized India-rubber two years before Goodyear applied for a patent, having given him a concurrent right to use it.

The statement that Mr. Day made opposition or was engaged to oppose Ray is not true. Mr. Day was never present at the taking of testimony except on the occasion of giving his own. The whole controversy was between the original inventor Fuller, whose agent the subscriber is, and the parties who are seeking to defraud him of his most valuable discovery.

Below is the opinions of counsel upon these questions.

New York, Sept. 23, 1850.

Sir: Yours of this date in relation to W. C. Fuller's and F. M. Ray's patents for India-rubber springs, is received. I state in reply that I have been one of the counsel for Mr. Fuller in the controversy, and understand the points involved in it. Mr. Fuller's patent was granted in England on the 23d October, 1845, and in the United States on the 24th October, 1846.

His American patent (the one in question) has not been annulled, repealed, or declared void or invalid, but it remains in full force and validity. He can maintain suits for violation of it. Purchasers using it cannot be made responsible to Mr. Ray under his patent: first, because they act under the authority of the United States, in their patent to Fuller, and second, because Ray's patent was issued contrary to the express provisions of the statute, and on that account is utterly void. No suit can be sustained upon it by Ray against any one.

The Commissioner of Patents, in his order for issue, indicated his doubts on the subject of the right to issue it (his predecessor, Mr. Burke, having expressly refused Ray a patent) and says he gives Ray the benefit of his doubts, and consequently made the order.—The error in granting this patent to Ray, under the facts and law of the case, is so palpable that I have been retained by Mr. Fuller to institute a suit in the U. S. Circuit Court to set it aside, and I am now preparing a Bill to be filed at once.

Your obedient servant, R. H. GILLET.

G. M. KNEVITT, Esq., Agent for W. C. Fuller.

I fully concur in the opinions above expressed.

F. B. CUTTING,

Counsel for Fuller, Wall st., Sept. 25, 1850.

G. M. KNEVITT,

Agent and Attorney for W. C. FULLER.

Great American Engineering

AND MECHANICAL WORK, just published in medium folio One Dollar, 75 cts. to Subscribers. Part VII of "Specimens of the Stone, Iron & Wood Bridges, Viaducts, Tunnels, Culverts, &c., &c., of the United States Railroads." By George Duggan, Architect and Civil Engineer.

The present part contains beautifully executed plans, elevations, sections and details of the elegant timber Bridge, (Burr's Patent,) 150 feet span, across Salmon River, Malone, on the line of the Northern-Ogdensburg-railroad, and isometrical views of Bridges 30, 40, 60, 82 and 88 feet span on the line of the Utica and Syracuse railroad, with specifications, form of contract, &c., &c., for the Connecticut River railroad.

"It is a work that was a great desideratum, and must prove of great benefit to the engineering profession generally, and especially to the tyro in practical engineering and mechanical knowledge; in truth it strikes us, that it would require years of labor and patient toil on the part of a young engineer to prepare the drawings, and collect the information that will be embodied in this work, and can now be secured for the trifling sum of \$9."—[Scientific Amer. March 16, 1850.]

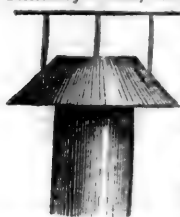
In connection with this subject (Iron Railroad Structures) we take occasion to call attention again to Mr. Duggan's valuable and expensive publication, exhibiting drawings, with full descriptions of the various stone, iron and wooden bridges, viaducts, tunnels, culverts, etc., of all the Railroads in the United States. Mr. Duggan is an accomplished Architect and Civil Engineer, who came from Ireland to this country to exercise his profession; but finding railroad construction here, in many respects, different from that he had been accustomed to in Europe, he applied himself to the study of our system; and the fruits of his researches and investigations embodied in this work, are well calculated to meet the exigencies of engineers, and to assist draughtsmen, bridge builders, mechanics and students.—[N. Y. Jour. of Com., Feb. 14, 1850.]

Published by **GEORGE DUGGAN,**
300 Broadway, New York.

To whom all communications should be addressed, and subscriptions forwarded.

Emerson's Patent Ventilator,

ADAPTED to Cars, Engine houses, Public Halls, Factories, Churches, School Houses, Dwellings, Chimney Flues, etc.



This Ventilator is stationary, and cannot get out of order. It is constructed in such conformity to certain ascertained laws of pneumatics, as to insure a constant draft outward, whatever may be the changing direction of the wind. The Massachusetts Mechanic Association have awarded a gold medal to the inventor, and the Manufacturers have already disposed of over 3,000 of the article. Manufactured and sold by **CHILSON, ALLEN, WALKER & Co.,**
351 Broadway, New York.

NOTICE

For Proposals for Railroad Iron, for the Alabama and Tennessee River Railroad,

TO BE MANUFACTURED FROM ALABAMA ORE.

THE Alabama and Tennessee River Railroad Co. invite proposals, until the 1st of January, 1851, for Iron Rails, to be made of Alabama Iron, for the Northern Division and part of the Southern Division of their road, embracing a distance of about 105 miles. The rails are to be of the H pattern, in lengths of 18 feet, and weighing 63 lbs. per lineal yard. They are to be delivered on the Coosa river, at a landing to be hereafter designated, between Kimulgee ferry and Fort Williams, commencing their delivery on the 1st of November, 1851, and continuing it at the rate of from 80 to 100 tons per week, until the whole quantity required (10,500 tons) shall have been delivered. They are to be inspected by Lewis Troost, Chief Engineer.

It is proper to state to iron masters and capitalists at a distance, that the country traversed by the Northern and part of the Southern divisions of the road abounds in excellent iron ore and bituminous coal, and possesses every advantage for the successful manufacture of iron, health, cheap labor and provisions.

Further information may be obtained by addressing the President of the Company at Selma, Ala.
By order of the Board of Directors.

J. W. LAPSLEY, President.

Great Work on Bridge Building, etc., etc.

JUST published in medium folio, One Dollar, 75 cts. to subscribers.

Part I. of a "THEORETICAL AND PRACTICAL TREATISE ON THE CONSTRUCTION OF BRIDGES IN STONE, IRON AND WOOD," By George Duggan, Architect and Civil Engineer.

The present part contains beautifully executed plans, elevations, sections, and centering, of the Bridge of St. Maixence, France, by M. Perronet, the eminent Architect and Engineer, and plans, elevations, sections, and details of the oblique Timber Bridge, 700 ft. long, constructed for a double track across the River Tyne, on the line of the Newcastle and Carlisle railroad, by John Blackmore, C. E., with an introductory article on the relative merits of the various materials employed in the construction of Bridges, as regards economy, strength and durability, and critical remarks on the various forms of bridges designed and constructed by the most eminent architects and engineers in Europe and America.

"PART VI. of Specimens of the Stone, Iron and Wood Bridges, etc., etc., of the United States Railroads," By George Duggan, Architect and Civil Engineer, contains specimens of the plates and letter press intended for the APPENDIX, being the commencement of a complete Treatise on the Theory and Practice of Bridge Building. This will be one of the most valuable works on the subject ever presented to the attention of engineers in this country—condensing the most important information on this branch of architecture contained in the writings of the most eminent scientific men in the French, German, Italian, and English languages, in the course of the last and present century. It will be illustrated by numerous accurate representations of bridges of the greatest celebrity in modern times. Elaborate articles will be given on the strength, property, and uses of the different materials employed, and on the most approved methods of constructing Cofferdams, Foundations, Centering, etc., with descriptions and drawings of the various engines and Machines that were found most useful in constructing the works, and a selection of such specifications as may be of service to the practical bridge builder. The sixth number treats of the Application of Iron to Railroad Structures, and is illustrated by beautiful drawings of the Bridge across the Delaware at Saw Mill Rift on the Erie Railroad, and of the bridge over Fairfield street, on the Manchester and Birmingham Railroad. The great success of this work thus far is the best tribute to its scientific merit and its adaptation to the wants of the American engineer."—[New York Daily Tribune, June 23, 1850.]

Published by George Duggan, 300 Broadway, New York, to whom all communications should be addressed and subscriptions forwarded.

Parties remitting Mr. Duggan \$5 and the remainder \$4 when they have been supplied with the first six parts of the "Theoretical and Practical Treatise on Bridge Building, etc." shall receive it monthly as published. To those making Mr. Duggan a present remittance of \$9, the work will be forwarded post free to any part of the United States.

Rosendale Cement.

THE NEWARK AND ROSENDALE LIME AND CEMENT CO. are now manufacturing at their works in NEWARK, N. J., and Ulster county, N. Y., a very superior article of *Hydraulic Cement*—also Lime Calcine Plaster, etc. Contractors and dealers will find it to their advantage to call or make application before purchasing elsewhere. All communications addressed to the subscriber, at Newark, N. J., will be punctually attended to.

17*15 **HENRY WILDE, Secretary.**

Notice to Contractors.

SEALED PROPOSALS will be received at the office of the James River and Kanawha Company in Richmond, until the 1st day of October next, for the construction of the Piers and Abutments of the Bridges across James River at New Canton, Hardwickville and Bent Creek. This work will be paid for in cash. Besides the usual reservation of 20 per cent. on the monthly estimates, the contractor or contractors will be required to give ample security, satisfactory to the Board of Directors, for the completion of the work at the time and in the manner specified in the contracts. Plans of the above works will be exhibited and specifications thereof delivered to the contractors at the office of John County, the Assistant Engineer in charge of the same in Columbia.

WALTER GWYNN,
Chief Eng. J. R. & K. Co.

August 16, 1850.

GRAHAM'S COMPOSITION, to Remove and Prevent Incrustation (or Scale) in STEAM BOILERS.

THIS valuable composition having been fully and extensively tested, is now offered to the public, as a sure remedy and preventive for incrustations in steam boilers of all descriptions. By its use, all scale is entirely removed from the boilers of Ocean and River Steamers, Locomotive and Stationary Engines, in from 3 to 20 running days, according to the size of the boiler and thickness of the scale. In New Boilers, all incrustation is prevented at a trifling expense.

The preservation of the boiler, great economy of fuel and labor, safety, and increased speed, are among the advantages to be derived from the use of this composition.

Orders should state the quality of water used, viz: "Salt," "Fresh," or "Brackish."

For sale, with directions for use, by
W. H. NEWMAN,
75 Pearl street,
New York.

TESTIMONIALS.

New York, August 17, 1850.

We have used Graham's Composition in the boilers of the Steamship Southerner, during several voyages between this place and Charleston. The boilers were old and very foul with scale, a very large quantity of which was removed by the use of the composition, and no new scale was formed.

From our own experience and observation in the use of the article, we are fully satisfied that it will effectually remove the incrustation made by sea water, and also that it will effectually prevent its formation.

We are also satisfied that the use of it will be attended with a great saving of fuel, and that it has no injurious effect upon iron.

DAVID N. MAXON, Engineer,
BERRY, Master,
Steamship Southerner.

Steamship Philadelphia, }

New York, August 27, 1850.

I have used "Graham's Composition for Steam Boilers," in the boilers of Steamship Philadelphia, on the voyage to and from Chagres, and am entirely satisfied that it will remove, dissolve and prevent all scale or incrustation in salt water boilers.

For the preservation of the boiler and economy of fuel and labor, I hereby recommend the employment of this composition in the Boilers of Ocean Steamers.

WM. BISBY,
Chief Engineer.

Novelty Iron Works, }

New York, July 5, 1850.

We have examined the specimen of Graham's Composition for preventing incrustation of steam boilers, and we believe it may be used with perfect safety in reasonable quantities for the purpose intended, as there does not appear to be any agent in the composition calculated to injure the iron.

STILLMAN, ALLEN & CO.

Piermont, May 20, 1850.

I have used "Graham's Composition," and find it to produce the intended effect; and I hereby, without hesitation, recommend it for Stationary, Marine and Locomotive Engine Boilers.

JOHN BRANDT,
Superintendent Motive Power
New York & Erie R.R.

New York, July 25, 1850.

In answer to many inquiries as to the practical effect of "Graham's Composition," I will state that I have used it in the boiler of the Steamboat Sunwick, which had become considerably incrustated with hard scale from both salt and fresh water. We used 10 lbs. per day, for three days, without blowing off the water, until the fifth day, when all was drawn off. To our astonishment, we found the whole interior of the boiler as clear of scale and smooth as when it came from the hands of the maker. The following week, we tried the same quantity in a small steam tow boat.—The boiler had old scale of long accumulation and very thick. We ran the boat three days without blowing off, and on the fourth day washed out the boiler and found it, like the "Sunwick's," perfectly clean and smooth as when new. I am therefore enabled to state that the use of the composition in these two instances under my own immediate observation and direction, has been attended with complete success.

JAMES MORROW,
Engineer Astoria Ferry.

Faggotted Car and Engine Axles

FORGED by RANSTEAD, DEARBORN & Co., Boston, Mass. These Axles enjoy the highest reputation for excellence, and are all warranted.

Ogden & Martin's ROSENDALE CEMENT.

WE are prepared to enter into arrangements for supplying our Cement for public works or other purposes. We warrant the cement equal in every respect to any manufactured in this country. It attains a great degree of hardness, sets immediately under water, and is a superior article for masonry coming in contact with water, or requiring great strength.

For sale in tight barrels, well papered, at their office by **OGDEN & MARTIN**, 104 Wall st.

February 16, 1850.

The above cement is used in most of the fortifications building by government.

Railroad and Mathematical Instruments.

KUNS & BASELER, Mathematical Instrument makers, manufacture and keep for sale all kinds of mathematical instruments: also drawing instruments, scales and balances for the use of chemists, professional gentlemen, jewellers, etc., etc., of the most perfect description, at the lowest price, at 91 Nassau street, New York.

Ibbotson, Brothers & Co's CELEBRATED CAST STEEL

AND Best Cast Steel Royal Improved Files, well known as better adapted for Engineers' and Machinists' purposes than any now in use in the United States.

Every description of Square, Octagon, Flat and Round Cast Steel, Sheet, Shovel and Railway Spring Steel, etc., and Steel to order for any purposes—manufactured at their works in Sheffield—and universally known by the old stamp "Globe."

HENRY I. IBBOTSON, Agent., 218 Pearl st., New York.

Railroad Iron.

OF ANY PATTERN AND WEIGHT,

Of a Favorite Brand, And deliverable in Bond, or Duty paid, at any Port of the U. S., contracted for on favorable terms, by **CHARLES ILLIUS**, 20 Beaver St., New York.

Pig and other Iron also contracted for. Sole Agent for "Baxter's Machine and Burning Oil"—particularly adapted for "Railroads" and other Machinery—Preferred to Sperr by the many now using it, and 25 per cent. cheaper.

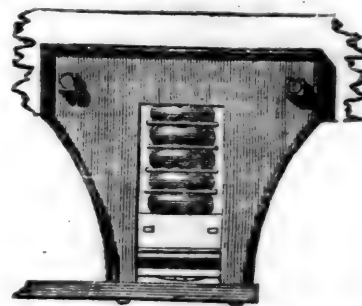
Coal.

CUMBERLAND SEMI-BITUMINOUS COAL superior quality for Locomotives, for sale by

H. B. TEBBETTS, No. 40 Wall St., New York.

May 12, 1849.

1m19

FULLER'S PATENT INDIA RUBBER SPRING.

THESE SPRINGS ARE THE CHEAPEST, the lightest and most durable of any yet known. They are easily applied to new or old cars, and there is small possibility of any accident occurring to them.

Other parties through Mr. Ray set up claims to an India Rubber Spring which, though the same in principle, is very inferior in its working and durability. Actions are in progress for an Infringement on Fuller's Patent against parties using that Spring.

The superiority of Fuller's Spring over that claimed by Mr. Ray is fully established and has frequently been testified to. The following are from gentlemen who have had much experience with both Springs.

"It will afford me pleasure to recommend your springs to the companies in this region, in preference to Ray's which I am confident are inferior in mechanical arrangement to yours." **JOHN M'RAE**, Engineer S. Carolina R. R., Charleston.

"I do not hesitate to allow you to say that I concur in Mr. M'RAE's opinion that Ray's springs are inferior in mechanical arrangement to Fuller's. I repeatedly expressed that opinion long before Mr. M'RAE had seen your springs (as I believe) and entertain it still." **WM. PARKER**, Gen'l Supt. of Baltimore and Ohio R. R.

Office of Sup't Norwich & Worcester R.R. Co. } December 26, 1849. }

"I most fully concur in the opinion of Jno. McRae, Engineer of S. Carolina Railroad, that 'Ray's Springs are inferior to Fuller's Springs;' and shall with pleasure recommend them to all Railroad Companies for adoption. I have used both springs on this road and have no hesitation in saying that I should in all cases prefer Fuller's Spring."

SAM'L H. P. LEE, JR., Sup't and Engineer.

Office B. & P. R. R. Co., } Boston, 20th December, 1849. }

"This company have cars fitted up with both Ray's and Fuller's 'Metallic India Rubber Springs;' and do not hesitate to say that Fuller's arrangement is very much superior to Ray's."

W. RAYMOND LEE, Supt.

The following result has been obtained by experiment upon one railroad.

A set of Trucks fitted with Steel Springs cost \$190.77 and weigh 2355 lbs. The same with Fuller's Springs, 131.71 " 1911 lbs.

Difference, \$59.06 " 444 lbs.

Not only is there an advantage in the cost, but owing to the great reduction in weight, the car can be made lighter throughout, and so an enormous saving in weight may be effected in a Train.

AGENTS.

G. M. KNEVITT, 35 Broadway, N. Y., **JOHN THORNLEY**, 110 Chestnut St., Philad. The BOSTON BELTING CO., Milk st., Boston. January 2, 1850.

American Cast Steel.

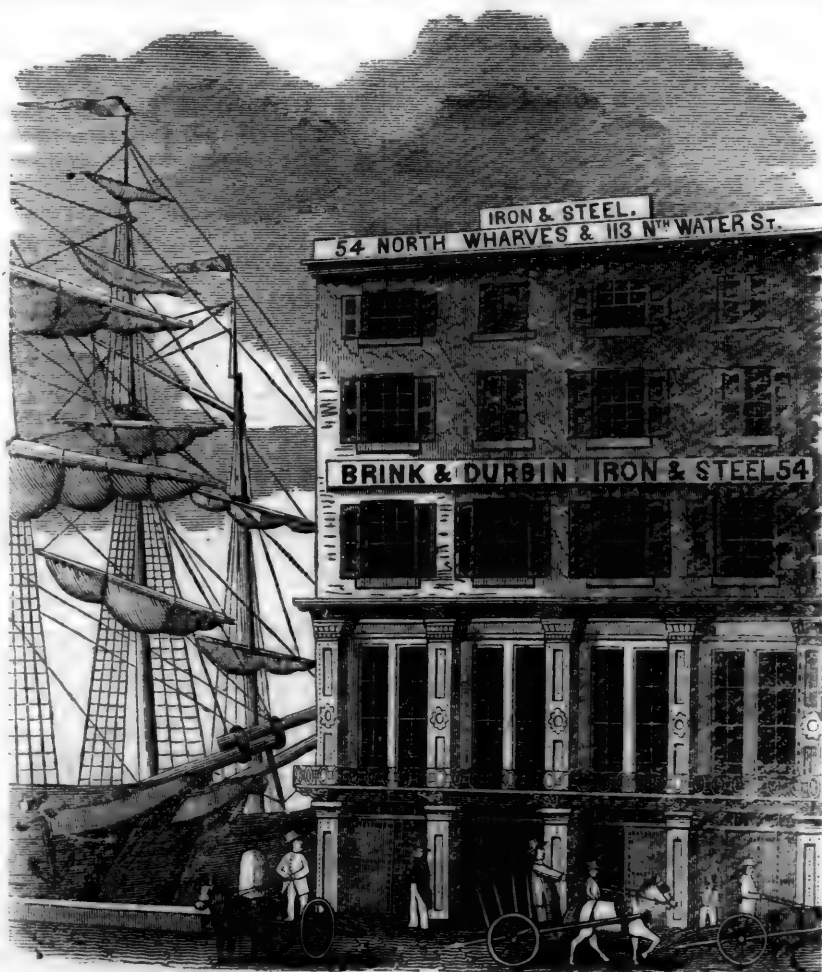
THE ADIRONDAC STEEL MANUFACTURING CO. is now producing, from American iron, at their works at Jersey City, N.J., Cast Steel of extraordinary quality, and is prepared to supply orders for the same at prices below that of the imported article of like quality. Consumers will find it to their interest to give this a trial. Orders for all sizes of hammered cast steel, directed to above, will meet with prompt attention.

May 26, 1849.

To Merchants, Railroad Companies, Machinists and Boiler Makers.

THE subscribers beg leave to call attention to their very large stock of Iron and Steel—of American, English, Swede and Norway make—of all the different kinds in use. Also, Railroad Iron, Ship, Boat and Railroad Spikes. They are also Agents for the Best Pennsylvania Locomotive Boiler and Tank Iron, each sheet of which will be stamped and warranted, at lowest mill prices. Our prices for all kinds of iron will be found very low, either for cash or approved credit.

BRINK & DURBIN, Philadelphia.



ENGINEERS.**Atkinson, T. C.,**

Alexandria and Orange Railroad, Alexandria, Va.

Bancks, C. W.,

Civil Engineer, Vicksburg, Miss.

Buckland, George,

Troy and Greenbush Railroad.

Clement, Wm. H.,

Little Miami Railroad, Cincinnati, Ohio.

Cozzens, W. H.,

Engineer and Surveyor, St. Louis, Mo.

Alfred W. Craven,

Chief Engineer Croton Aqueduct, New York.

Davidson, M. O.,

Eckhart Mines, Alleghany Co., Maryland.

Fisk, Charles B.,

Cumberland and Ohio Canal, Washington, D. C.

Felton, S. M.,

Fitchburgh Railroad, Boston, Mass.

Floyd-Jones, Charles,

South Oyster Bay, L. I.

Gzowski, Mr.,

St. Lawrence & Atlantic Railroad, Montreal, Canada.

Gilbert, Wm. B.,

Rutland and Burlington Railroad, Rutland, Vt.

Grant, James H.,

Nashville and Chattanooga R. R., Nashville, Tenn.

S. W. Hill,

Mining Engineer and Surveyor, Eagle River, Lake Superior.

Hewson, M. Butt,

Memphis, Tenn.

Holcomb, F. P.

Southwestern Railroad, Macon, Ga.

Johnson, Edwin F.

New York and Boston Railroad, Middletown Ct.

Latrobe, B. H.,

Baltimore and Ohio Railroad, Baltimore, Md.

Miller, J. F.,

Worcester and Nashua Railroad, Worcester, Mass.

Morris, Elwood,

Schuylkill Navigation, Schuylkill Haven, Pa.

Morton, A. C.,

Atlantic and St. Lawrence Railroad, Portland, Me.

McRae, John,

South Carolina Railroad, Charleston, S. C.

Nott, Samuel,

Lawrence and Manchester Railroad, Boston.

Prichard, M. B.,

East Tennessee and Georgia R. R., Cleveland, Tenn.

Roebbling, John A.,

Trenton, N. J.

W. Milnor Roberts,

Bellefontaine and Indiana Railroad, Marion, Ohio.

Roberts, Solomon W.,

Ohio and Pennsylvania Railroad, Pittsburgh, Pa.

Sanford, C. O.,

South Side Railroad, Virginia.

Schlatter, Charles L.,

Northern Railroad (Ogdensburg), Malone, N. Y.

Sours, Peter,

Rahway, New Jersey.

Stark, George.,

Bost., Con. and Mont. R. R., Meredith Bridge, N. H.

Steele, J. Dutton,

Pottstown, Pa.

Trautwine, John C.,

Panama Railroad—Address through office of Panama Railroad Co., 78 Broadway, N. Y.

Trimble, Isaac R.,

Philad., Wil. & Baltimore Railroad, Wilmington, Del.

Tinkham, A. W.,

United States Fort, Bucksport, Me.

Thomson, J. Edgar.,

Pennsylvania (Central) Railroad, Philadelphia.

Troost, Lewis,

Alabama and Tennessee Railroad, Selma, Ala.

Whipple, S.,

Civil Engineer and Bridge Builder, Utica, N. Y.

Williams, E. P.,

Auburn and Schenectady Railroad, Auburn, N. Y.

Williams, Charles H.,

Milwaukee, Wisconsin.

HOTELS.**Exchange Hotel,**Adjoining Eastern Railroad Depot,
BUFFALO, N. Y.BY.....**FISK & SPERRY,**
Late of Delevan House, Albany.**J. D. Abraham, Architect,**NO. 300 MAIN STREET,
BUFFALO, N. Y.**Fountain Hotel,**LIGHT STREET, BALTIMORE,
P. THURSTON.....Proprietor.**DUNLAP'S HOTEL,**On the European Plan,
NO. 135 FULTON STREET,
Between Broadway and Nassau St.,
NEW YORK.**MANSION,**Corner of Maine and Exchange Streets,
P. DORSHIMER.....BUFFALO.**GUY'S****United States Hotel,**(Opposite Pratt street Railroad Depot,)
BALTIMORE.

JOHN GUY.

WILLIAM GUY.

American Hotel,Pratt street, opposite the Railroad Depot,
BALTIMORE.

HENRY M. SMITH.....Proprietor.

Late of the Exchange & St. Charles Hotels, Pittsburg.

Washington Hotel,

BY JOHN GILMAN,

\$1 Per Day.
No. 206 Pratt street, (near the Depot,)
BALTIMORE.**Barnum's City Hotel,**

MONUMENT SQUARE, BALTIMORE.

This Extensive Establishment, erected expressly for a Hotel, with every regard to comfort and convenience, is situated in the centre and most fashionable part of the city, and but a few minutes' walk from the Railroad Depots and Steamboat Landings.

The House has lately undergone a thorough repair, embracing many valuable improvements, and will accommodate 250 Guests.

BARNUM & CO.

JONES' HOTEL,NO. 152 CHESTNUT STREET,
PHILADELPHIA.

BIRDSON & WHEAT, Proprietors.

BUSINESS CARDS.**Lithography.**

JOHN P. HALL & CO.,

161 Main st., Buffalo, (Commercial Advertiser Build.)

Are prepared to execute all kinds of Lithography in good style and at reasonable rates. Particular attention will be paid to Engraving Railroad Maps, Engineer's Plans and drafts, etc., and orders in this line are respectfully solicited.

J. T. Hodge

Will attend to the examination of mining tracts near Lake Superior, and prepare Reports and Maps.

Address, during the Summer,

[Ontanagon Postoffice, Lake Superior.

Cumberland Steam Coal,

FROM THE

FROSTBURG MINES, MD.

H. A. TUCKER,

Agent of Frostburg Coal Co.

No. 50 Wall Street, New York.

Eaton, Gilbert & Co.,Railroad Car, Coach and Omnibus Builders,
TROY, N. Y.**Charles T. Jackson, M. D.,**

STATE ASSAYER, late Geologist to Maine, Rhode Island, New Hampshire, and the United States, offers his services to his friends and the public in making any Chemical, Mineralogical or Geological researches that may be required for the improvement of Agriculture and the Manufacturing Arts. Particular attention will be paid to the exploration of mines and to assaying of ores of the metals.

State Assayer's office, 31 Somerset st.

Boston Sept. 3, 1850.

To Railroad Companies and Mechanical Establishments.

A Person of considerable experience and practical knowledge in Mechanical, Civil and Marine Engineering, is anxious to meet with an engagement with either a Private Individual or Public Company, who may have works either to design or execute in the above branches of the Engineering Profession.

Address Z. Y., 47 Atlantic st., South Brooklyn, L. I.

STEEL AND FILES.**R. S. Stenton,**

20 CLIFF STREET, NEW YORK,

AGENT FOR

J. & Riley Carr'sBAILEY-LANE WORKS, SHEFFIELD,
Manufacturers of Cast, Shear, German and Blister**STEEL**

Of all descriptions. Warranted Good

FILES.

Manufacturers of Machinists' Warranted Best Cast Steel Files, expressly for working upon Iron and Steel, made very heavy for recutting.

A full Stock of Steel and Files at all times on hand.

6m4

Walter R. Johnson,

CIVIL AND MINING ENGINEER AND ATTORNEY for Patents, Office and Laboratory, F St., opposite the Patent office, Washington, D. C.

Dudley B. Fuller & Co.,IRON COMMISSION MERCHANTS,
No. 139 GREENWICH STREET,
NEW YORK.**Manning & Lee,**GENERAL COMMISSION MERCHANTS,
NO. 51 EXCHANGE PLACE,
BALTIMORE.

Agents for Avalon Railroad Iron and Nail Works, Maryland Mining Company's Cumberland Coal 'CED'—Potomac and other good brands of Pig Iron.

Cop Waste.

CLEAN COP WASTE, suitable for cleaning Railroad, Steamboat and Stationary Engines, constantly on hand and for sale by

KENNEDY & GELSTON,
54 Pine St., New York.

October 27, 1848,

3m

PLUSHES

FOR

Railway Cars & Omnibuses.**F. S. & S. A. MARTINE,**

112 WILLIAM ST., NEAR JOHN.

ARE now receiving a large and complete assortment of Plain and Figured PLUSHES, of their own importation, which will be sold at the lowest market price, viz: Crimson, Maroon, Scarlet, Green, Blue, Purple, etc.

ALSO—CURLED HAIR, the best manufactured in market.

Samuel Kimber & Co.,
COMMISSION MERCHANTS
WILLOW ST. WHARVES, PHILADELPHIA.

AGENTS for the sale of Charcoal and Anthracite Pig Iron, Hammered Railroad Car and Locomotive Axles, Force Pumps of the most approved construction for Railroad Water Stations and Hydraulic Rams, etc., etc.

July, 27, 1849.

James Herron, Civil Engineer,OF THE UNITED STATES NAVY YARD,
PENSACOLA, FLORIDA,

PATENTEE OF THE

HERRON RAILWAY TRACK.

Models of this Track, on the most improved plans, may be seen at the Engineer's office of the New York and Erie Railroad.

To Railroad Companies.**—WROUGHT IRON WHEELS—**
SAFETY AND ECONOMY.**NORRIS' LOCOMOTIVE WORKS,**
SCHENECTADY, NEW YORK,

Are Manufacturing Wrought Iron Driving, Truck, Tender, and Car Wheels—made from the best American Iron. Address **E. S. NORRIS.**
May 16, 1849.

Manufacture of Patent Wire
ROPE AND CABLES,

For Inclined Planes, Suspension Bridges, Standing Rigging, Mines, Cranes, Derrick, Tilters, &c., by
JOHN A. ROEBLING, Civil Engineer,
TRENTON, N. J.

Doremus & Harris,ANALYTICAL & CONSULTING CHEMISTS,
179 BROADWAY, NEW YORK.**SCHOOL OF CHEMISTRY.****To Engineers and Surveyors.**

E. BROWN AND SON Mathematical Instrument makers No. 27 Fulton Slip, New York, make and keep for sale, Theodolites, Levelling inst., Levelling rods, Surveyors Compasses, and Chains, Cases of Mathematical drawing insts. various qualities, together with a general assortment of Ivory Scales and small insts. generally used by Engineers.

Ranstead, Dearborn & Co.,

MANUFACTURERS OF

LOCOMOTIVE CRANKS AND CAR AXLES,
ALSO**WROUGHT IRON SHAFTING,**

And All Kinds of Hammered Shapes.
Forge at Commercial Point, Dorchester,
Office 25 Foster's Wharf, opposite No. 211 Broad St.
BOSTON.

Henry I. Ibbotson,

IMPORTER of Sheffield and Birmingham Goods.
Also, Agent for the Manufacture of Telegraph Wire.
218 PEARL ST., NEW YORK.

Cumberland, (Md.) Coals for
Steaming, etc.

ORDERS RECEIVED FOR AND FILLED
by **J. COWLES, 27 Wall St., N. Y.**

Samuel D. Willmott,

MERCHANT, AND MANUFACTURER OF
CAST STEEL WARRANTED SAWS,
—AND FILES—

IMPORTER OF THE

GENUINE WICKESLY GRINDSTONES
NO. 8 LIBERTY STREET,
NEW YORK.

Railroad Instruments.

THEODOLITES, TRANSIT COMPASSES,
and Levels, with Fraunhoffer's Munich Glasses,
Surveyor's Compasses, Chains, Drawing Instruments,
Barometers, etc., all of the best quality and
workmanship, for sale at unusually low prices, by

E. & G. W. BLUNT,

No. 179 Water St., cor. Burling Slip.
New York, May 19, 1849.

IRON.**Car Wheel Iron.**

100 Tons "Columbia" No. 2 Cold Blast Charcoal
Iron.

300 Tons "Salisbury" No. 1, do. do.
For sale by **CHARLES T. GILBERT,**
No. 80 Broad st.

New York, Sept. 21, 1850.

Railroad Spikes.

THE subscribers are prepared to make and execute
contracts for Railroad Spikes of a superior quality,
manufactured by the New Jersey Iron Company,
at Boonton. **DUDLEY B. FULLER & CO.**
139 Greenwich st. corner of Cedar.

Railroad Iron.

FOR SALE—500 Tons of superior flat bar Railroad
Iron, two and a half three-fourths—which has
been in use on the Cumberland Valley Railroad for
about three years. For terms apply to Henry J. Bid-
dle, Esq., Philadelphia, or to **FRED. WATTS,**
President of the Cum. Val. R.R., Carlisle, Pa.
Carlisle, Sept. 17, 1850.

Railroad Iron.

1650 Tons, weighing about 61 lbs. per yard, 40
tons, weighing about 52 lbs. per yard, and
825 tons, weighing about 53½ lbs. per yard, of the lat-
est and most approved patterns of T rail, for sale by
BOORMAN, JOHNSTON & CO.,
119 Greenwich street.

New York, Aug. 26, 1850.

N.B.—B. J. & Co are also prepared to take con-
tracts for English rails, delivered in any of the Atlan-
tic ports of the United States.

Railroad Iron.

THE Undersigned, Agents for Manufacturers, are
prepared to contract to deliver Rails of superior
quality, and of any size or pattern, to any ports of dis-
charge in the United States.

COLLINS, VOSE & CO.,

74 South St.

New York, June 1, 1850.

Railroad Iron.

1,500 Tons weighing 53 lbs. per lineal yard.

500 " " 57 " " "

500 " " 56 " " "

500 " " 60 & 61 lbs. "

Also 2½ flat rails. All the above being of approv-
ed patterns. For sale by

DAVIS, BROOKS & CO.,

68 Broad street.

N.B.—Rails imported on commission, or at a fixed
price.

Iron.

Pig Iron, Anthracite and Charcoal; Boiler and Flue
Iron, Spring and Blistered Steel, Nail Rods, Best Re-
fined Bar Iron, Railroad Iron, Car Axles, Nails, Stove
Castings, Cast Iron Pipes of all sizes, Railway Chairs
of approved patterns for sale by

COLEMAN, KELTON & CAMELL,

109 N. Water St., Philadelphia.

Railroad Iron.

THE UNDERSIGNED, HAVING made arrange-
ments abroad, are prepared to contract for the de-
livery of Foreign rails, of approved brands upon the
most favorable terms.

They will also make contracts for American rails,
made at their Trenton works, from Andover Iron, in
whole or in part, as may be agreed upon.

They are prepared to furnish Telegraph, Spring and
Market Wire; Braziers and Wire Rods; Rivets and
Merchant Bars to order, all made exclusively from An-
dover Iron. The attention of parties who require iron
of the very best quality for special purposes, is respect-
fully invited.

COOPER & HEWITT,

17 Burling Slip, New York.

February 15, 1850.

Glendon Refined Iron.

Round Iron, Band Iron, Hoop Iron,
Square " Flat " Scroll "

Axles, Locomotive Tyres,
Manufactured at the Glendon Mills, East Boston, for
sale by **GEORGE GARDNER & CO.,**
5 Liberty Square, Boston, Mass.

Sept. 15, 1849.

3m37

**PATENT HAMMERED RAILROAD, SHIP &
BOAT SPIKES.**—The Albany Iron Works
have always on hand, of their own manufacture, a
large assortment of Railroad, Ship and Boat Spikes
from 2 to 12 inches in length, and of any form of head.
From the excellence of the material always used in
their manufacture, and their very general use for rail-
roads and other purposes in this country, the manu-
facturers have no hesitation in warranting them fully
equal to the best spikes in market, both as to quality
and appearance. All orders addressed to the subscrib-
ers at the works will be promptly executed.

JOHN F. WINSLOW, Agent.

Albany Iron and Nail Works, Troy, N. Y.
The above Spikes may be had at factory prices, at
Erastus Corning & Co. Albany; Meritt & Co., New
York; E. Pratt & Brother, Baltimore Md.

LAP—WELDED
WROUGHT IRON TUBES

FOR

TUBULAR BOILERS,
FROM ONE AND A QUARTER TO SEVEN
INCHES IN DIAMETER.

THE ONLY Tubes of the same quality and man-
ufacture as those so extensively used in England,
Scotland, France and Germany, for Locomotive, Ma-
rine and other Steam Engine Boilers.

THOMAS PROSSER & SON, Patentees,
28 Platt street, New York.

Railroad Iron.

THE UNDERSIGNED ARE PREPARED TO
contract for the delivery of English Railroad Iron
of favorite brands, during the Spring. They also re-
ceive orders for the importation of Pig, Bar, Sheet, etc.
Iron. **THOMAS B. SANDS & CO.,**
73 New street,
New York.

February 3, 1849.

Iron Store.

THE Subscribers, having the selling agency of the
following named Rolling Mills, viz: Norristown,
Rough and Ready, Kensington, Triadelphia, Pott-
grove and Thorndale, can supply Railroad Companies,
Merchants and others, at the wholesale mill prices for
bars of all sizes, sheets cut to order as large as 58 in.
diameter; Railroad Iron, domestic and foreign; Loco-
motive tire welded to given size; Chairs and Spikes;
Iron for shafting, locomotive and general machinery
purposes; Cast, Shear, Blister and Spring Steel; Bol-
ter, rivets; Copper; Pig Iron, etc., etc.

MORRIS, JONES & CO.,

Iron Merchants,

Schuylkill 7th and Market Sts., Philadelphia.
August 16, 1849. ly33

Railroad Iron.

THE MOUNT SAVAGE IRON WORKS, AL-
legany county, Maryland, having recently pas-
sed into the hands of new proprietors, are now prepar-
ed, with increased facilities, to execute orders for any
of the various patterns of Railroad Iron. Communi-
cations addressed to either of the subscribers will have
prompt attention. **J. F. WINSLOW, President**
Troy, N. Y.

ERASTUS CORNING, Albany,**WARREN DELANO, Jr., N. Y.,****JOHN M. FORBES, Boston.****ENOCH PRATT, Baltimore, Md.**

November 6, 1848.

Railroad Iron.

THE SUBSCRIBERS ARE PREPARED TO
take orders for Railroad Iron to be made at their
Phoenix Iron Works, situated on the Schuylkill Riv-
er, near this city, and at their Safe Harbor Iron Works,
situated in Lancaster County, on the Susquehanna
river; which two establishments are now turning out
upwards of 1800 tons of finished rails per month.
Companies desirous of contracting will be promptly
supplied with rails of any required pattern, and of the
very best quality.

REEVES, BUCK & CO.

45 North Water St. Philadelphia,

March 15, 1849.

Tredegar Iron Works.

ROLLING MILL FOUNDRY AND MACHINE SHOPS. The undersigned continues to manufacture at his Works in this city (from best charcoal metal) Bar Iron of every description, embracing—Rounds and Squares, from 1½ to 5 inches diameter. Flats, from ½ to 7 inches, all thicknesses. Bands and Scrolls, all sizes. Boiler plate and Plough Iron. Railroad and Locomotive Axles and Tires. Locomotive Frames, Spikes and Plates. Hoops, Ovals, Half Ovals, Half Rounds, Angle, T, L, and indeed every description of Iron usually manufactured, all of which he warrants to be equal to any made in this country. He also manufactures at his Foundry and Machine Shops all descriptions of Railroad Work, say, Locomotives, Railroad Wheels and Axles complete and ready for the road, Railroad Chairs, etc. Also, Marine and Stationary Engines all sizes, Sugar mills and Engines, Horse mills, and every kind of Machinery usually required for the operations of the country. He has paid particular attention to getting up machinery, etc., for Gold Mine operations, and those in want of such work might find it to their advantage to give him a call.

J. R. ANDERSON.
Richmond, Va., Sept. 10, 1850.

CUT NAILS OF BEST QUALITY, BAR IRON (including Flat Rails) manufactured and for sale by
FISHER, MORGAN & CO.,
75 N. Water St., Philadelphia.

Iron Wire.

REFINED IRON WIRE OF ALL KINDS, Card, Reed, Cotton-flyer, Annealed, Broom, Buckle, and Spring Wire. Also all kinds of Round, Flat or Oval Wire, best adapted to various machine purposes, annealed and tempered, straightened and cut any length, manufactured and sold by
ICHABOD WASHBURN.
Worcester, Mass., May 25, 1849.

Wheel, Forge and Foundry Iron.

LOCUST GROVE Wheel Iron of great strength and superior chilling property.
Balt. Charcoal Forge Iron, from Patuxent, Curtis Creek and Gunpowder furnaces.
Elkridge Foundry Iron, of superior strength and softness. Anthracite and Charcoal Iron from Pennsylvania and Virginia. Gas and Water Pipes, Lamp Posts from Elkridge furnace.

LEMMON & GLENN,
6m9 62 Buchanan's Wharf, Baltimore.

S. S. Keyser & Co.,
IRON WAREHOUSE,
Corner of South and Pratt Streets,
BALTIMORE, MD.

Selling Agents for the Rough and Ready Bar Iron and Elk Boiler and Flue Iron Rolling Mills, Sarah and Taylor Furnaces, and Wrightsville Hollow Ware Foundry, and Dealers in Bar and Sheet Iron, and Cast, Sheer, German, Blister, Spring and Electroplated Steel, etc., etc.

Smith & Tyson,

GENERAL COMMISSION MERCHANTS,
No. 25 South Charles St., Baltimore, Md.

AGENTS for the Celebrated Columbia Pig Iron, suitable for Car Wheels and Chilled Rolls.
Columbia refined Charcoal Blooms; Refined Charcoal Juniatta Billet Iron for Wire; Refined Iron for Bridging, of great strength; Cut Nails, Spikes, and Brads; Railroad Spikes and Wrought Chairs. 22tf

Stickney & Beatty,
DEALERS IN IRON AND IRON
MANUFACTURERS.

AGENTS for the Balt. City Rolling Mill, from which establishment they are prepared to furnish Elliott's round, square, and flat bar iron, puddled and charcoal boiler plates and billet iron—also agents for the sale of the Laurel and Maryland (Balt.) charcoal forge pig irons, Balt. hard iron for chilling wheels, anti-Eaton nails, Catoctin foundry iron, boiler blooms from the Caledonian works, Wm. Jessop & Son's cast steel, Coleman's blister steel and nail rods, hoop, band, sheet, oval and common English Iron.
Nos. 18 and 20 South Charles st., Baltimore.

Railroad Iron.

CONTRACTS made by the subscribers, agents for the manufacturers, for the delivery of Railway Iron, at any port in the United States, at fixed prices, and of quality tried and approved for many years, on the oldest railways in this country.
RAYMOND & FULLERTON, 45 Cliff St.

IRONDALE PIG METAL, MANUFACTURED and for sale by the Bloomsburg Railroad Iron Co.
LINDLEY FISHER, Treasurer.
75 N. Water St., Philadelphia.

Railroad Iron.

2000 Tons, weighing 58 pounds per lineal yard, of the most approved pattern of T rails, in store and to arrive, for sale by
COLLINS, VOSE & CO.,
74 South St.
New York, June 1, 1850.

Railroad Iron.

3,000 TONS C. L. MAKE 63½ lbs. per yard, now landing and to arrive.
Also contracts made for future delivery of above superior make English Iron.
300 Tons Banks Best Iron, Round, Square and Flat.
200 " English Bar " " " "
10 " 9-16 Square Iron for Railroad Spikes.
For sale in lots to suit purchasers by
DAVID W. WETMORE.
New York, March 26, 1850. 3m

WILLIAM JESSOP & SONS'
CELEBRATED CAST-STEEL.

The subscribers have on hand, and are constantly receiving from their manufactory.

PARK WORKS, SHEFFIELD.

Double Refined Cast Steel—square, flat and octagon. Best warranted Cast Steel—square, flat and octagon. Best double and single Shear Steel—warranted. Machinery Steel—round. Best and 2d gy. Sheet Steel—for saws and other purposes. German Steel—flat and square, "W. I. & S." "Eagle" and "Goat" stamps. Genuine "Sykes," L Blister Steel. Best English Blister Steel, etc., etc., etc.

All of which are offered for sale on the most favorable terms by
WM. JESSOP & SONS,
91 John street, New York.

Also by their Agents—

Curtis & Hand, 47 Commerce street, Philadelphia.
Alex'r Fullerton & Co., 119 Milk street, Boston.
Stickney & Beatty, South Charles street, Baltimore.
May 6, 1849.

JOHNSON, CAMMELL & Co's
Celebrated Cast Steel,

AND
ENGINEERING AND MACHINE FILES, which for quality and adaptation to mechanical uses, have been proved superior to any in the United States. Every description of square, octagon, flat and round cast steel, sheet, shovel and railway spring steel, best double and single shear steel, German steel, flat and square, goat stamps, etc. Saw and file steel, and steel to order for any purposes, manufactured at their Cyclops Steel Works Sheffield.

JOHNSON, CAMMELL & CO.,
100 William St., New York.

November 23 1849.

Railroad Iron.

THE Undersigned, Agents for Manufacturers, are prepared to contract for the delivery of English, Welsh and Scotch Rails, of any pattern and weight, also for every description of English, Welsh, Scotch, and Swedish Iron, Railway Chairs and Spikes, Rivets, Bolts, Nuts, Washers, Chain Cables, Anchors, Tin Plates, German Spelter, Iron Castings, and every description of Machinery.

WILLIAM BIRD & CO.,
Iron and Tin Plate Merchants,
44 Wall st., New York.

And at 5 Martin's Lane, City, London,
and 140 Buchanan st., Glasgow.

July 27th, 1850.

To the Proprietors of Rolling
Mills and Iron Works.

THE Undersigned—Proprietors of Townsend's Furnace and Machine Shop, Albany—are extensively engaged in the manufacture of Machinery and fixtures for Iron, and Copper Rolling Mills, and Iron Works. Having paid particular attention to the manufacture of *Rolls* (Rollers), both *chilled* and *dry-sand*, they feel confident that they can execute orders for such castings in a satisfactory manner. And to give assurance of this, they beg leave to refer to the following named persons, proprietors and managers of some of the most extensive rolling mills in the country, viz: Jno. F. Winslow, J. Tuckerman, H. Burden, W. Burtt, J. & J. Rogers, Salsus & Co., J. B. Bailey, L. G. B. Cannon, Hawkins & Atwater, etc., etc.

F. & T. TOWNSEND.

Albany, August 12, 1849,

Railroad Iron.

B. O. Railway Tires, Railway Wheels,
Scotch Pig Iron, Tin Plates and Banca Tin,
Muntz's Patent Metal Sheathing,
Baltimore Copper.

Contracts for Rails made on behalf of the manufacturers, for delivery at any ports in the United States, at fixed prices.

Bowling Tires and Tire Bars and Scotch Pigs imported to order.

Muntz's Ship-sheathing, and a general stock of Tin Plates and Banca Tin in store, and for sale by
RAYMOND & FULLERTON, 45 Cliff st.

Bowling Iron. Stamped B.O.

Railway Tire Bars Rivet Iron
Locomotive and other Axles Locomotive Frame do
Boiler Plates Bars,
and every other description of this superior Iron.

The subscribers, agents for the sale of Bowling Iron, are prepared to execute orders for importation, especially for railway and machinery uses, with despatch from the manufacturers.

RAYMOND & FULLERTON, 45 Cliff st.

Lovegrove's Patent Cast Iron
Water and Gas Pipes.

THE Subscriber, the Inventor and Patentee of the Centrifugal mode of giving form to metallic substances while in a molten state, is preparing to make Cast Iron Water and Gas Pipes, of any dimensions, at prices much lower than they can be made in the old manner, and the pipes warranted to stand a pressure of three hundred pounds to the square inch, and to be soft enough to drill. Steam Engines and all kinds of machinery. Cast Iron Doors and Frames, and Mill Castings of every description, made to order.

THOMAS LOVEGROVE,

Machinist and Founder,

West Falls Avenue, below Pratt st., Baltimore.

Ray's Patent India Rubber
Car Springs.

Savannah, Ga., May 22, 1850.

FOWLER M. RAY, Esq.,
Dear Sir: I have no hesitation in saying, after having used on our road your springs and Fuller's, that I consider yours decidedly the best in every particular, and in this opinion I am sustained by all our officers. Fuller's spring has a tendency to split, and also to chafe or abrade by the constant friction on the cast iron plates or discs: and in my opinion is not near so elastic as yours.

Your springs, which have been in use on our road for 12 or 15 months past, and in constant use under both passenger and freight cars, are to all appearances as elastic, sound and good, as when first put in use.

We are now building eighty-five new cars, of which for fifty-sets the springs have been ordered of you:

GEORGE A. ADAMS,

Master Carpenter,

Central Railroad and Banking Co. of Georgia.

Connecticut River Railroad Office, }
Northampton, May 4, 1850. }

E. CRANE, Esq.,

Dear Sir: It is now about two years since I first tried the experiment of using a set of Ray's India-rubber Springs upon one of our merchandise cars, and although the car has been in constant service since that time, I do not on examination find the slightest difference either in the thickness or elasticity of the material.

The same result has followed wherever we have applied them, either for wheel or draw springs on Engines, Tenders or Cars. At present we use no other; either in replacing old springs or building new cars—and I am perfectly satisfied that for economy, durability, safety, and ease of motion, that Ray's India-rubber is the best article for Springs which has been presented to the public.

Yours respectfully, **J. HUNT,**
Supt. Connecticut River Railroad.

EDWARD CRANE, Esq.,

Dear Sir: Having applied to cars of the Boston and Worcester Railroad Corporation, Ray's Vulcanized Rubber Springs (where they have been in use for some two years last past), I have had occasion to observe their operation, and am free to say in answer to your inquiries, that they retain their elasticity perfectly during all changes of atmospheric temperature: and are in my opinion a most valuable acquisition to Railroad Cars—are not liable to derangement, as is the case with steel springs; while at the same time it costs less to apply them. Respectfully yours,

D. N. PICKERING,

Supt. Motive Power, Bos. & Wor. Railroad,
Boston, April 15th, 1850.

Monument Foundry.

A. & W. DENMEAD & SON,
Corner of North and Monument Sts.,—Baltimore,
HAVING THEIR

IRON FOUNDRY AND MACHINE SHOP

In complete operation, are prepared to execute faithfully and promptly, orders for Locomotive or Stationary Steam Engines, Woolen, Cotton, Flour, Rice, Sugar Grist, or Saw Mills, Slide, Hand or Chuck Lathes, Machinery for cutting all kinds of Gearing, Hydraulic, Tobacco and other Presses, Car and Locomotive patent Ring Wheels, warranted, Bridge and Mill Castings of every description, Gas and Water Pipes of all sizes, warranted, Railroad Wheels with best fagotted axle, furnished and fitted up for use, complete. Being provided with Heavy Lathes for Boring and Turning Screws, Cylinders, etc., we can furnish them of any pitch, length or pattern. Old Machinery Renewed or Repaired—and Estimates for Work in any part of the United States furnished at short notice.
June 8, 1849.

**RAILROAD CAR
AND COACH TRIMMINGS.**
Doremus & Nixon,
IMPORTERS AND FURNISHERS

HAVE FOR SALE
Plain Garnet Plush. Fig. Garnet Plush (Butterfly pat.
" Crimson " " Crimson " (Elegant.
" Scarlet " " " " (Gen. Taylor.
BROCATELLES.
Crimson Silk Brocates. Gold and Maroon do.
Gold and Blue " " Brown " do.
Silk and Wool " " of every color.

MOQUETTES,
Of elegant designs and colors.
GERMAN CLOTH FOR CAR LININGS.
The most beautiful goods ever shown in this country, and the subscribers are the sole agents for the sale of them.

Oil cloths Enamelled with Gold. These goods can be
" Silver. furnished in any dimensions req'd.
Do. Silver ground velvet printed. CURLED HAIR
Of every description and quality.
JNO. W. A. STRICKLAND, Agent.
New York, 1850. 1y16

**FOWLER M. RAY'S
Patent India-rubber Railroad
CAR SPRING.**

New York and Erie Railroad Shops.
Piermont, March 26, 1850.

This will certify that from practical experience in the use of Fowler M. Ray's India rubber Car Springs, I believe them to be far superior to any others now in use.

I have never known them to be affected by any change of temperature, as other Rubber Springs have been affected on this road.

I am at the present time repairing a Passenger Car that Mr. Ray and myself mounted with his springs about two years and eight months since.

The springs are at the present time as perfect, to all appearances, as when first applied to the car.

Respectfully yours,

HORACE B. GARDNER,
Foreman of the Car Shops.

Supt. Office N.Y. & H. R.R., }
New York, March 8, 1850.

This is to certify that we have used the Rubber Springs manufactured by Mr. F. M. Ray for the past twenty months, "both for Passenger and Freight Car Springs and Bumpers, and of different sizes," and have in every case given entire satisfaction, and I consider them the best spring now in use.

M. SLOAT, Supt.

Boston, March 5, 1850.

In answer to your enquiry about India-rubber Springs, I have to say that we have used them to a considerable extent on both freight and passenger cars, and also on several of our tenders; and I am very well satisfied that they answer all the purposes for which they are intended. I believe the India-rubber will soon supersede all other springs for cars and tenders.
Yours truly,
S. M. FELTON,
Supt. Fitchburg Railroad.

Office New Jersey Railroad Co., }
Jersey City, March 8, 1850.

FOWLER M. RAY, Esq.,

Dear Sir: In answer to your enquiries respecting the operation of the Vulcanised Rubber Springs, purchased by our company from you some two years since, I reply that they are superior to any spring in use, (that I have either seen or heard of).

The improved form of your spring, consisting of a solid piece of vulcanised rubber with bands on the outside, is far superior to your first form, consisting of disks of rubber with metallic plates interposed.

The last named form was tried, if you recollect, at a much earlier period; and then was replaced by your last form.

I have no hesitation in saying that your springs have given entire satisfaction, and most cheerfully recommend them to railroad companies throughout the country for the following reasons:

1st. The cost is 30 per cent. less.
2d. Saving of weight on each car of 8 wheels from 700 to 800 lbs.

3d. Less care and attention is required, as they are not liable to get out of repair.

4th. A great saving is secured in the wear and tear of the cars and rails from their great elasticity.

5th. The freedom from noise.

6th. There is greater safety in case of accident, as they cannot be broken.

7th. The comfort of passengers is enhanced sufficiently to pay the expense, waiving all the other reasons that I have given.

Should this fail to satisfy any person enquiring, you are at liberty to refer to me, No. 150 Washington St., Jersey City. Yours respectfully,

T. L. SMITH, Supt.

New York, March 11, 1850.

I have used the Patent India-rubber Spring purchased of Mr. Ray, upon the cars of the New York and New Haven Railroad, and have found them efficient and economical; and when applied to the axles and draw springs, believe them to be quite equal to any in use. I have found a combination of these springs with a steel spring under the transom beam a very satisfactory arrangement, and am now using this plan in all new cars.

Yours respectfully,

ROBERT SCHUYLER.

February 25, 1850.

From practical observation of the use of the India-rubber Car Springs, manufactured and sold by your company, we are entirely satisfied in their application, and do not hesitate to recommend them as elastic, durable, requiring no repairs for years, and retaining their consistency during all extremes of weather. We have applied them for the past two years, and consider them superior for all railroad purposes.

Yours truly,

OSGOOD BRADLEY, Car Builder, Worcester.
T. & C. WASON, do. Springfield.
DEAN, PACKARD & MILLS, do. do.
DAVENPORT & BRIDGES, do. Cambridgeport.

Office of the New Jersey Railroad Co., }
Jersey City, March 7, 1850.

This is to certify that we have had Mr. F. M. Ray's India-rubber Springs in constant use under our cars, and as Bumper Springs for upwards of two years, and they have in every way given perfect satisfaction.

The present form of spring we deem far superior to the form of Disk, having used both forms, although we have none of those made in Disks at present in use.

We take pleasure in recommending these springs to all railroad companies.

J. P. JACKSON, Vice Pres.
New Jersey Railroad and Trans. Co.

Roxbury, February 28, 1850.

In compliance with your request, I take great pleasure in stating the result of my experience in the use of "Ray's Patented Vulcanised India-rubber Car and Engine Springs." We have used them nearly two years, and never had one fail in any way. The cold weather does not affect them, as it has other rubber springs we have used.

With sixteen years' experience as superintendent of machinery on the Boston and Providence railroad, I take pleasure in saying that your springs are the best we ever used, or I ever saw used elsewhere. We have 20 cars rigged with them, of which I can say that the springs are as good now as when first applied. I put 24 lbs. of the rubber under the forward end of one of our heaviest engines, taking off 250 lbs. of steel springs—it has been in use 18 months, and is in as good condition now as when first put under the engine.

Very respectfully yours,

GEO. S. GRIGGS,
Supt. of Machinery, Boston and Prov. R.R.

Fall River, February 2, 1850.

In answer to yours of the 20th ult. I would say that this company has for some 10 or 12 months past been using "Ray's India-rubber Springs." We have applied them to both passenger and freight cars with uniform success. They have invariably preserved their elasticity and consistency through all the extremes of weather; and we are now applying them whenever the steel spring fails. I am well satisfied that they are particularly adapted for railroad purposes.

Very respectfully yours,

GEO. HAVEN,
Supt. Fall River Railroad.

Jersey City, March 9, 1850.

This is to certify that the present form of Mr. F. M. Ray's India-rubber Car Spring I consider far superior to the form of Disk, having used both forms.

I take pleasure in recommending these springs to all railroad companies.

DAVID H. BAKER,
Foreman of Car Shop of N.J. R.R. & Trans. Co.

Harlem R.R. Depot, }
New York, March 7, 1850.

This is to certify that we have used Mr. F. M. Ray's India-rubber Springs for over eighteen months, and find them to be easy and durable, and recommend them to railroad companies as being superior to anything we have tried.

J. M. SMART,
Foreman at 42d St. Depot.

Old Colony Railroad Office,
Boston, March 6, 1850.

EDWARD CRANE, Esq.,

President New England Car Co.,
Dear Sir: In compliance with your request I would state that the Old Colony Railroad Company have had in use upon their road, India-rubber Springs furnished by your company, for more than eighteen months past, during which time they have been extensively used under Passenger and Freight Cars, Locomotive Tenders, and for Drawer and Buffing Springs, with the most perfect success. The elasticity and consistency of the Rubber has never been unfavorably affected by either extremes of heat or cold—and from the experience which we have had in the use of Rubber Springs, I think them well adapted for railroad purposes—and therefore we have for some months past used Rubber almost exclusively, in all places where springs are required.

Respectfully yours, etc.,

JAS. H. MOORE,
Supt. O. C. Road.

Troy, February 27, 1850.

We have been using your India-rubber Car Springs for nearly two years—and we take pleasure in saying that in our opinion the rubber has to a certain extent already, and may eventually entirely supersede all other Springs for Railroad Car purposes. We now use it entirely for Draw Springs and Bumpers, considering it better and lighter than steel.

During our two years' experience in the use of it, we have not known any to lose their elasticity, or fail in any way; and we cheerfully recommend the rubber for railroad car springs. Very respectfully,

EATON, GILBERT & CO.

Passenger Car Linings.

THE Advertiser continues to make to order the Enamelled Car Linings which have been so highly approved the last three years, and are now exclusively used by all the Northern Railroads. No pains are spared to get out new styles, and adapt them to the tastes of every consumer.

Orders addressed to **CHARLES STODDER, No. 75 Kilby street, Boston,** will have prompt attention.
March 23, 1850. 2m

India-rubber for Railroad Cos.

RUBBER SPRINGS—Bearing and Buffer—Fowler's Patent—Hose from 1 to 12 inches diameter. Suction Hose. Steam Packing—from 1-16 to 2 in. thick. Rubber and Gutta Percha Bands. These articles are all warranted to give satisfaction, made under Tyer & Helm's patent, issued January, 1849.—No lead used in the composition. Will stand much higher heat than that called "Goodyear's," and is in all respects better than any in use. Proprietors of railroads do not be overcharged by pretenders.

HORACE H. DAY,
Warehouse 23 Courtland street.

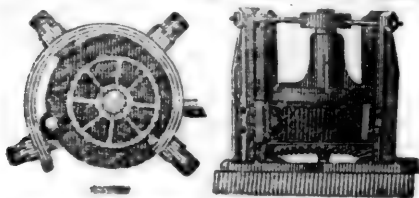
New York, May 21, 1849.

Spikes, Spikes, Spikes.

ANY person wishing a simple and effective Spike Machine, or a number of them, may be supplied by addressing
J. W. FLACK,
March 6, 1850. Troy, N. Y.

MACHINERY.

Henry Burden's Patent Revolving Shingling Machine.



THE Subscriber having recently purchased the right of this machine for the United States, now offers to make transfers of the right to run said machine, or sell to those who may be desirous to purchase the right for one or more of the States.

This machine is now in successful operation in ten or twelve iron works in and about the vicinity of Pittsburgh, also at Phoenixville and Reading, Pa., Covington Iron Works, Md., Troy Rolling Mills, and Troy Iron and Nail Factory, Troy, N. Y., where it has given universal satisfaction.

Its advantages over the ordinary Forge Hammer are numerous: considerable saving in first cost; saving in power; the entire saving of shingler's, or hammerman's wages, as no attendance whatever is necessary, it being entirely self-acting; saving in time from the quantity of work done, as one machine is capable of working the iron from sixty puddling furnaces; saving of waste, as nothing but the scoria is thrown off, and that most effectually; saving of staffs, as none are used or required. The time required to furnish a bloom being only about six seconds, the scoria has no time to set, consequently is got rid of much easier than when allowed to congeal as under the hammer. The iron being discharged from the machine so hot, rolls better and is much easier on the rollers and machinery. The bars roll sounder, and are much better finished. The subscriber feels confident that persons who will examine for themselves the machinery in operation, will find it possesses more advantages than have been enumerated. For further particulars address the subscriber at Troy, N. Y.

P. A. BURDEN.

Railroad Spikes and Wrought Iron Fastenings.

THE TROY IRON AND NAIL FACTORY, exclusive owner of all Henry Burden's Patented Machinery for making Spikes, have facilities for manufacturing large quantities upon short notice, and of a quality unsurpassed.

Wrought Iron Chairs, Clamps, Keys and Bolts for Railroad fastenings, also made to order. A full assortment of Ship and Boat-Spikes always on hand.

All orders addressed to the Agent at the Factory will receive immediate attention.

P. A. BURDEN, Agent,
Troy Iron and Nail Factory, Troy, N. Y.

CHILLED RAILROAD WHEELS.—THE UNDERSIGNED are now prepared to manufacture their Improved Corrugated Car Wheels, or Wheels with any form of spokes or discs, by a new process which prevents all strain on the metal, such as is produced in all other chilled wheels, by the manner of casting and cooling. By this new method of manufacture, the hubs of all kinds of wheels may be made whole—that is, without dividing them into sections—thus rendering the expense of banding unnecessary; and the wheels subjected to this process will be much stronger than those of the same size and weight, when made in the ordinary way.

A. WHITNEY & SON,
Willow St., below 13th,
Philadelphia, Pa.

Brown's Old Established SCALE WARE HOUSE,

NO. 234 WATER ST., NEW YORK.

THE Subscriber, Practical Manufacturer of Scales of every description, respectfully asks the attention of Railroad Companies to his Improved Wrought Iron Railroad Track and Depot Scales which for strength, durability, accuracy, convenience in weighing, and beauty of workmanship, are not surpassed by any others in this country.

He is aware that this is rather a bold assertion for him to make, yet he can say with confidence that they have but to be tried to give them precedence over all others.

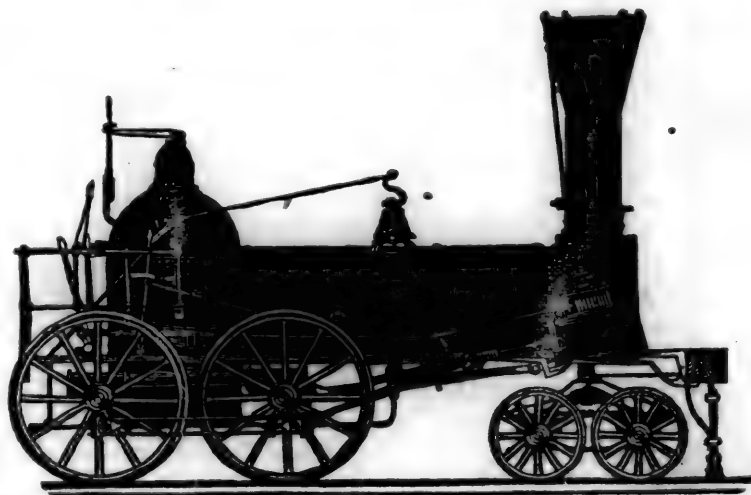
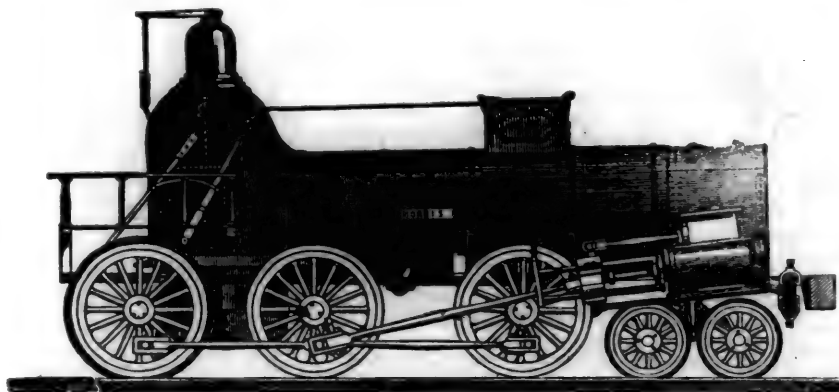
J. L. BROWN.

Bank Scales made to order, and all Scales of his make Warranted in every particular.

References given if required

NORRIS' LOCOMOTIVE WORKS.

BUSHHILL, SCHUYLKILL SIXTH-ST., PHILADELPHIA,



THE UNDERSIGNED Manufacture to order Locomotive Steam Engines of any plan or size. Their shops being enlarged, and their arrangements considerably extended to facilitate the speedy execution of work in this branch, they can offer to Railway Companies unusual advantages for prompt delivery of Machinery of superior workmanship and finish.

Connected with the Locomotive business, they are also prepared to furnish, at short notice, Chilled Wheels for Cars of superior quality.

Wrought Iron Tyres made of any required size—the exact diameter of the Wheel Centre, being given, the Tyres are made to fit on same without the necessity of turning out inside.

Iron and Brass castings, Axles, etc., fitted up complete with Trucks or otherwise.

NORRIS, BROTHERS

PATENT MACHINE MADE HORSE-SHOES.

The Troy Iron and Nail Factory have always on hand a general assortment of Horse Shoes, made from Refined American Iron.

Four sizes being made, it will be well for those ordering to remember that the size of the shoe increases as the numbers—No. 1 being the smallest.

P. A. BURDEN, Agent,
Troy Iron and Nail Factory, Troy, N. Y.

Etna Safety Fuse.

THIS superior article for igniting the charge in wet or dry blasting, made with DUPONT'S best powder, is kept for sale at the office and depot of

REYNOLDS & BROTHER,
Sole Manufacturers,
No. 85 Liberty St.,
NEW YORK.

And in the principal cities and towns in the U. States.

The Premium of the AMERICAN INSTITUTE was awarded to the Etna Safety Fuse at the late Fair held in this city.

November 3, 1849.

ly

COLUMBUS, OHIO,
Railroad Car Manufactory.
RIDGWAYS & KIMBALL,

HAVE established at this central point, the manufacture of Passenger, Freight, Gravel and Hand Cars for Railroads, and assure all Western Railroad Companies that it will be their constant aim to procure the best materials and workmen, and to turn out the best kind of work at fair prices. Specimens may be seen on the Columbus and Xenia Railroad. The patronage of Railroad Companies is respectfully solicited.

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To Inventors and Patentees.

OWEN G WARREN, ARCHITECT, Has had many years' experience as Agent for obtaining Patents, both in this country and Europe, and will transact such business promptly and reasonably. Persons at a distance can have their business done by correspondence—without the necessity of visiting this city or Washington. Office No. 94 Merchants Exchange, Wall st., corner of Hanover st., up stairs.

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AMERICAN RAILROAD JOURNAL.

STEAM NAVIGATION, COMMERCE, MINING, MANUFACTURES.

HENRY V. POOR, Editor.

ESTABLISHED 1831.

PUBLISHED WEEKLY, AT No. 136 NASSAU ST., NEW YORK, AT FIVE DOLLARS PER ANNUM IN ADVANCE.

SECOND QUARTO SERIES, VOL. VI, No. 40.]

SATURDAY, OCTOBER 5, 1850.

[WHOLE No. 755, VOL. XXIII.]

ASSISTANT EDITORS,

J. T. HODGE, *For Mining and Metallurgy.*
GEN. CHAR. T. JAMES, *For Manufactures and the
Mechanic Arts.*
M. BUTT HEWSON, C. E., *For Civil Engineering.*

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American Railroad Journal.

PUBLISHED BY J. H. SCHULTZ & Co., 136 NASSAU ST.

Saturday, October 5, 1850.

Ship Building in New York.

New York has now come to be the great national thermometer, which indicates with unerring certainty the progress which this country makes in every department of industry or pursuit. In its claims to be the commercial metropolis, it has now no rival. Every great movement in the United States, either originates here, or makes this city the base of its operations. Almost the entire amt of the agricultural products of the great West are poured into her lap. As the seat of commerce, she feels all the variations in the value of cotton, the great regulator of exchange, as sensitively as does the planter himself. In nothing is her superiority more manifest than in the manner she has monopolised the advantages which have flown from the discoveries of gold in California, and the great migration to that State. No movement ever affected this city so much in so short a time. New York

has not only received all the gold that has come from thence, but she has had the carrying, at enormous profit, of almost all who have gone thither. From the great supplies of gold, her money market has been kept in an easy condition, while in other leading cities it has been at a very high rate. To furnish conveyance to the vast crowds that have been constantly pressing to the gold regions, has stimulated ship building to an extraordinary extent; so that New York is now the great ship-building port of the world.

What chiefly distinguishes this city in the ship-building line, is the construction of her magnificent sea going steamers. She is the only city in the United States that has engaged to any considerable extent in this work. The public are hardly aware how rapidly steamships are superseding sailing vessels, or how superior they are to the latter as the transporters of commerce. The growth of the city, as well as the experience of those who are employing steamships, is full proof of this. They have given an impulse to New York such as she never felt before, and have made her the grand focus of our commercial system.

Below we give a statement of tonnage either launched or on the stocks since January last, together with the builders' names, class of vessel, tonnage, etc., etc., which will be followed with a more minute account of such ships as deserve more particular notice. It is chiefly taken from the N. York Tribune, and is very full and complete in its details.

VESSELS LAUNCHED.

New York.

Builders.	Vessels.	Rate.	Tons.
Lawrence & Sneed, N. America,	steamship.	1850	
Westervelt & Mackey,	Robert Kelly, packet.	1150	
	Ocean Queen, packet.	1200	
	Fran. P. Sage, packet.	1200	
	William Tell, packet.	1200	
	Rhine..... packet.	1000	
William H. Webb.....	Isaac Webb..... packet.	2000	
	Vanguard..... packet.	1350	
	Florida..... steamship.	1500	
	Alabama..... steamship.	1500	
	Celestial..... clipper.	900	
	Jos. Walker..... packet.	1350	
	Union..... steamship.	1500	
Jacob Bell.....	Baltic..... steamship.	3700	
	St. Louis..... packet.	1000	
	White Squall, clipper.	900	
Smith & Dimon.....	Universe..... packet.	1300	
	Mandarin..... clipper.	300	

William H. Brown.....	Arctic..... steamship.	3500
	Boston..... steamship.	700
	New World steamship.	700
	New York..... steamship.	700
	Pacific..... steamship.	1200
William Collyer.....	Chingarora, steamboat.	600
	St. Lawrence steamboat.	700
Jeremiah Simonson.....	Promethes, steamship.	2000
	..... steamboat.	100
	..... steamboat.	65
Thomas Collyer.....	Island City, steamboat.	280
	T. Collyer, steamboat.	250
	..... steamboat.	850
	Jenny Lind, steamboat.	100
Steamships.....	13 Steamboats.....	7
Packets.....	10 Clippers.....	3

Total vessels launched in N. York.....32

Williamsburgh.

Builders.	Vessels.	Rate.	Tons.
P. Paterson & Stack.....	Star of the West, pack.	1280	
	Angostura..... brig.	800	
	Lady Franklin packet.	1300	
	Arctic..... packet.	1390	
Jabez Williams.....	..... schooner.	250	
Packets.....	3 Schooner.....	1	
Brig.....	.....	1	

Total launched.....5

Launched at the Port of New York from January

Rate.	No.	Tons.	Rate.	No.	Tons.
Steamships..	12	19,550	Packets..	13	16,610
Steamboats..	7	2,245	Clippers..	3	2,600
			Brig.....	1	800
			Schooner. 1		250
Tons of steamcraft.	21,795				
Whole number of vessels	.....			
launched.....	37		Tons of sailcraft.	20,260	
Grand total of tonnage launched.....	42,055				

VESSELS ON THE STOCKS.

New York.

Builders.	Vessels.	Rate.	Tons.
Lawrence & Sneed,.....	..... steamboat.	600	
	..... steamboat.	600	
Westervelt & Mackay	Matamoros, steamboat.	900	
	Humboldt..... steamship.	2500	
	Placer..... steamship.	1100	
	Underwriter, packet.....	1100	
	..... clipper.....	1050	
William H. Webb.....	Saml M. Fox, packet.....	1600	
	..... packet.....	1600	
	Golden Gate, steamship.	2000	
	..... clipper.....	1100	
Jacob Bell.....	Berry..... steamship.	800	
	..... propeller.	2000	
Smith and Dimon.....	..... steamship.	2200	
William H. Brown.....	..... steamship.	400	
	..... steamship.	600	
William Collyer.....	..... steamship.	1200	
	..... lighter.....	50	
	..... lighter.....	50	

Thomas Collyer.....	Carribeam...steamship.1800
Steamships.....	10 Steamboats.....3
Packets.....	3 Propeller.....1
Clippers.....	2 Lighters.....2

Total vessels building in N. York.....21

Williamsburgh.

Builders.	Vessels.	Rate.	Tons.
P Patterson & Stack,	San Francisco, steamship.2000		
Bro. Jonathan,	steamship.1000		
Hornet.....	propeller.....1150		
	clipper.....800		
Jabez Williams & Co.....	clipper.....1350		

Steamships.....3 Propeller.....1

Clippers.....2

Total.....5

Green Point.

Builders.	Vessels.	Rate.	Tons.
Collyer and Webb.....	steamboat. 100		

Brooklyn.

Burtis & Morgan.....	steamboat. 450		
----------------------	----------------	--	--

Murray & Whiting.....	sloop..... 70		
-----------------------	---------------	--	--

Hoboken.

Cape & Allison.....	schooner.. 270		
---------------------	----------------	--	--

Steamboats.....	2 Sloop.....1		
-----------------	---------------	--	--

Schooners.....	2		
----------------	---	--	--

Total in last three places.....5

Building at the Port of New York at the present date, September 30, 1850.

Rate.	No.	Tons.	Rate.	No.	Tons.
Steamships..12	16,500		Packets..3	4,300	
Steamboats..5	2,250		Clippers..4	4,800	
Propellers..2	3,150		Schooners..2	530	
Total steam vessels.....			Sloop.....1	70	
building 19; total..21,000			Lighters..2	100	
Total tonnage build- ing.....31,200			Total sail 12	9,300	

The Work of Nine Months.

Vessels built.....37	Tonnage.....42,055
----------------------	--------------------

Vessels building.....31	Tonnage.....31,200
-------------------------	--------------------

Grand Total of tonnage.....73,255
New York, Sept. 30th, 1850.

LAWRENCE & SNEEDEN.

The North America, a first class steamship of 1,850 tons, originally intended for the Norwich and New London Steamboat Company's service at the east, but finally finished for California trade to run between the ports of Panama and San Francisco, under the command of Capt. Bliven, formerly of the *Jamestown*. Her dimensions are: length, 255 feet; beam, 34½; hold, 22. She is built of oak, locust and cedar, and will be elegantly finished.—She has four masts, a beam engine of 60 inches cylinder and 12 feet stroke. She is a large and strongly built ship, and will be fitted up so as to accommodate 500 passengers. *The North America* was launched on the 16th inst. all her machinery except the boilers and the shafts being in at the time; and will be finished speedily.

Two steamboats will be built as soon as possible at this yard for Brooks & Barton of Savannah, to run as regular packets between Savannah and Charleston. Belknap, Cunningham & Co. are building the engines at the Phoenix Works. These steamers will be small; about 500 or 600 tons burden; length, 180; beam, 27; hold, 11; cylinders, 44 inches; stroke, 10 feet. It is expected that both will be completed by the 1st day of May next.

WESTERVELT & MACKAY.

The William Tell, a fine packet ship, was launched in July by this firm. She is about 1,200 tons burden; owned by Boyd & Hincken, and under the command of Capt. Willard, formerly of the packet *Oneida*. The *Tell* is 175 feet long, 37½ beam, 32 hold. She sailed on her first voyage on the 6th of August and arrived at Havre on the 29th.

The Matamoros, is a steamship of 900 tons, built for Messrs. Morgan & Harris, and intended for the Mexican Gulf, to ply between New Orleans and Brazos Santiago. She is square rigged forward and is in all respects a strong and safe vessel. Her dimensions are: length, 215; beam, 33; hold, 18; cylinder, 56 inches; stroke, 10 feet. She engine is from the Morgan Works. *The Matamoros* is ready to be launched.

The steamship Humboldt, previously noticed by us under the name of the *Havre*, now on the stocks in this yard, and nearly ready for launching, is a splendid specimen of naval architecture. This vessel is the colleague of the *Franklin*, and will with her form a line of steam packets leaving New York once a month for Havre, touching at Southampton on the outward passage to land passengers and mails. Mortimer Livingston is the agent of the line. The *Humboldt* is 2,500 tons burden; copper fastened and iron braced; she is 280 feet long, 40 feet beam and 28 feet deep. Captain Lines, late of the *New York*, will take command of the *H. The Franklin*, Capt. Walton, is ready for sea. The engines of the *Humboldt* are in progress at the Novelty Works; they are of the side lever pattern, 95 inch cylinder, and 9 feet stroke. The cost of these ships has been stated at \$500,000 each.

The steamship Placer, is in a state of forwardness that promises launching in a few weeks. She is built for Capt. Skiddy, and Davis and Brooks. She will be of 1,100 tons burden; length, 220 feet; beam, 36; hold, 24½. Stillman, Allen & Co. are building her engines.

The Rhine, a beautiful packet ship of 1,000 tons built for E. D. Hurlbut & Co's. Havre line, was launched a few days since. She will be under the command of Capt. Doane, late of the *Trustina*.—She is 106 feet long, 36 beam, and 28½ hold; she has three decks; the upper one being occupied by the cook-houses, cow-house, windlass, closets, &c., &c.

The Underwriter, thus named in complement to Walter R. Jones, Esq., will be launched in November, and it is advertised to sail on the 11th of December for Liverpool, under command of Captain Shipley, late of the *John R. Skiddy*. The *Underwriter* is to be 1,100 tons burden, a three-decker, and is very strongly built; length, 185 feet; beam, 38; hold, 22; built of live oak and cedar. She will take her place in R. Kermit's Red-Star Line of Liverpool packets.

A clipper ship is under way for A. A. Low, intended for the Canton trade, and to be placed under the command of Capt. Palmer, late of the *Oriental*.—The new ship will be 1,050 tons burden, 190 feet long, 39 feet beam, and 21½ hold; she will be one of the finest sail vessels turned out this season.

WILLIAM H. WEBB.

The Joseph Walker, on the stocks at our last report, was launched early in August; she is commanded by Capt. Hoxie, and has taken her place in Samuel Thompson & Nephew's Black-Star Line for Liverpool. As the *Joseph Walker* was built under the personal supervision of her popular and able captain, and of course everything about her done as it should be, we append a full description of her, which will be of interest to builders and owners. The arrangements for the first, second and third cabins, and for steerage passengers, are very complete. There are three sky lights to the second and third cabins, and three sky lights to the steerage, and four separate gangways to the steerage, which is well ventilated from the deck and side lights below. The cooking arrangements are complete, and are acknowledged by most shipmasters out of the port to be the best in use. On the deck is an engine of sufficient power to throw the water over the maintop gallant yard, to which is attached one hundred and twenty feet of hose. There is likewise introduced through the sides of the ship, patent valves, which will flood the hold of the ship with water, in a short time, in case of fire, or for cleansing purposes, which is one of the most useful improvements got up for ships. The forecastles are fitted up in keeping with other parts of the ship, having tables, lockers, and a place for a library in each, which, no doubt, will be supplied with interesting books. Her tonnage is 1,325 tons. The following are her dimensions: 180 feet long on deck, 50 beam, and 23 feet hold; keel white oak, two tiers deep, made in 8 pieces, 16 inches sided, and 34 inches deep, bolted together with copper bolts; stem white oak, sided 16 inches; apron live oak, sided 30 inches; night heads live oak, sided 12 inches; all fastened with large copper bolts below deep loaded line, and large iron bolts sided at head 18 inches, at keel 16 inches; inner post live oak; main and other transoms all live

oak, and well fastened with large bolts; fashion pieces of live oak, being double; floor timbers of white oak, 24 feet long, sided 12 to 14 inches, and molded 10 inches; first, second, and third futlocks white oak, sided 10 to 11 inches; fourth futtock of live oak, sided 10 inches; top timbers of live oak, sided 9 to 10 inches; stanchions of locust, and sided 9 to 10 inches; thirteen frames forward, and 13 frames aft; of live oak; keelsons, each end, forward and aft, of live oak; deadwoods each end, and stemsons live oak; keelsons amidships 3 tiers deep, of white oak, sided 16 inches, and making from bottom of keel to top of keelson, a mass of timber 8 feet 9 inches through, all well bolted together with 1½ inch bolts; keelson at floor heads of pitch pine, sided 15 inches, two streaks and two tier deep, all square, fastened to frame and to each other with inch iron and 1½ inch locust treenails; bilge streaks, seven in number, 8 inches thick; lower deck clamps 8 inches thick; ceiling between clamps and bilge streaks 7 inches thick, and all square fastened with ½ inch iron and 1½ inch locust treenails, and all the outside fastenings through the same in addition to the above; ceiling on flat of floor 4 inches, white oak; lower deck beams pitch pine, 18 to 20 inches sided, and 15 to 16 inches molded; lodging and bosom knees of lower deck of white oak, sided 10 to 14 inches, and very large body and arms and fastened with 1½ inch bolts; mast partners of pitch pine, very large and double kneed; stanchions in lower hold very large and each one kneed to main keelson, and beams with 4 knees, all well fastened; deck breast hooks of live oak and breast hooks in hold of white oak and very large, including wider breast hooks, which are all well fastened with a great number of large bolts; lower deck water ways of pitch pine, three tier and large, let down into ends of beams and fastened with three bolts in every timber, and frame ceiling between decks of pitch pine, six inches square, fastened with iron bolts and locust treenails; breast hooks between decks very large and fastened with a great number of large iron bolts; upper deck clamps of 7 inches square, fastened with ½ iron bolts, and 1½ locust treenails; beams of pitch pine, sided 14 to 18 inches, and molded 12 inches; lodging and bosom knees of white oak, sided 7 inches; hanging knees to every beam, sided 10 to 14 inches, and are thoroughly bolted with 1½ iron bolts; water ways pitch pine, and fastened to every timber and beam with 1 inch bolts; deck plank of white pine, 3½ inches thick, and bolted edgewise to water ways and timbers; planshire and rails of white oak, 6 inches thick; forecastle beams kneed to frame of the ship, which run up high above forecastle deck, with oak knees; catheads bedded and solid in frame of the ship, and kneed to the same with large white oak knees, very heavily bolted; a very large breast hook over the bowsprit and one below it fastened with a great number of bolts; the frame, whole length of poop, is double, and each poop deck beam kneed to the same with hanging knees; poop bulkhead of white oak, 4 inches thick and bolted with a great number of bolts, and kneed to poop deck beam and upper deck beams, which are very large pitch pine. Such is a brief sketch of the way in which our world-renowned packet ships are made. The *Joseph Walker* is now on her first voyage out.

The steamship Union is just launched. She is a fine sea steamer of 1,500 tons, 212 feet long, 34 feet wide and 22 deep with two side lever engines of 65 inch cylinder and 8 feet stroke, built at the Allaire Works. Spofford & Tileston are the owners, and Capt. Budd, late of the *Northerner*, will command her; she will go in the New York and Charleston steam packet line.

The Samuel M. Fox is on the stocks. She is intended for Livingston's Havre Packet Line, and is named after the head of the late firm of Fox & Livingston. She will be about 1,600 tons burden, 170 feet long, 37 feet beam, and 20 feet hold; her building and furniture will be equal to those of our first class packets.

Another Packet ship, the mate of the *Samuel M. Fox*, and in all respects like her, will be built by Mr. Webb. The keel has just been laid.

The Golden Gate, a steamship of 2,000 tons burden, is going up for Howland & Aspinwall's Pacific Line. She will be launched in about three months. Her length is 275 feet; beam, 40; hold,

20; she is heavily braced, and will be finished in the most substantial manner. She is to have two oscillating engines, from the Novelty works, of 85 inch cylinder and 9 feet stroke.

A clipper ship keel has been laid for Taylor & Merrill. The vessel is intended for the Canton trade, and will be of the first class for speed. She will be 180 feet long.

JACOB BELL.

The *White Squall*, a beautiful clipper ship, built by this veteran, is now on her way to China via San Francisco. She belongs to Messrs. Booth and Edgar. We have lost our memoranda of her dimensions; but we believe she measures about 1,000 tons. She has been got up with an eye to speed, and will probably make one of the quickest voyages ever performed.

The *Pioneer*, a propeller of 2,000 tons, originally intended for a packet, is now in progress. She is a strongly fastened live oak ship, owned by Spofford and Tileston, and is to run to Liverpool—and will be the first American propeller ever employed in the European trade. The *Pioneer* will be fitted up with every convenience for the comfort and accommodation of all on board. It is estimated that she will carry 2,700 tons, drawing 20½ feet of water. Her fastenings will be thorough, with five keelsons running fore and aft. Her engines will be built at the West Point Foundry at Cold Spring; the cylinders are eight-five inches in diameter, with a five-foot stroke, the whole resting on a solid foundation of at least fifty inches in depth. Her owners feel assured of her making the passage between Liverpool and New York easily in sixteen days. She will be commanded by Capt. Eldridge, late of the packet ship *Roscius*, a gentleman intimately known as a thorough commander by all in the habit of voyaging between this port and Liverpool; the propeller's paddles will have a diameter of 15 feet.

A steamship keel is laid for Spofford and Tileston. The ship will measure 800 tons; length, 200 feet; beam, 32; hold, 21. She is intended to run in connection with the Southerner to Charleston. The engine is from the Novelty Works. A side lever, 70-inch cylinder, 9 feet stroke. We understand that the ship will be called *The Berry*; after the popular captain of that name.

SMITH & DIMON.

The *Mandarin*, launched on the day of the publication of our last report, is a beautiful clipper ship built for the East India trade. She is nearly 800 tons burden; length, 150 feet; beam, 34; hold, 19. Goodhue and Co. we believe are the owners. She is now on her outward voyage via San Francisco.

A Steamship, of 2,200 tons, the partner of the *Golden Gate*, is on the stocks for Howland and Aspinwall. She is 225 feet long, 40 beam, 20 hold. Her engines are to be made at the Novelty Works—they are like those of the *Golden Gate*, oscillating engines of 85 inch cylinder and 9 feet stroke.

WILLIAM H. BROWN.

The *Pacific*, a splendid steamship, was launched a few days since, her engines being in working order, and steam up. (Mr. B. had launched two boats in running order in January last.) The *Pacific* made a trial trip on Wednesday last, and proved herself all that could be anticipated, running past the British steamer *Asia*, the bragging ship of the Cunard line, with perfect ease. The *P* was built for Capt. Jarvis and others; Capt. J. will take command, and expects to get off in a few weeks.—The dimensions of the vessel are; length, 230 feet; beam, 31; hold, 19; tonnage, 1,200. Her engine, one of the upright pattern, was built by H. R. Dunham; cylinder, 70 inches; stroke, 10 feet. The *Pacific* bids fair to be one of the most rapid vessels yet sent to the Western Coast.

A steamer is now under way at Mr. Brown's yard, under the superintendence and to be commanded by Capt. Dunn, late of the ship *America*. She is intended to run on the Sacramento, is 400 tons, burden, 170 feet long, 26 wide and 10½ hold. Her engine, built by J. F. Rodman, is now on board; it is 35 inch cylinder and 10 feet stroke.—She will be launched in the course of two weeks, with steam up ready for a start.

Another steamer, for the Pacific trade, is under way; she is 215 feet long, 28 wide and 10 feet deep; burden, 600 tons. J. E. Coffee is building

her engine, a 42 inch cylinder with 9 feet stroke, which will be put in before she is launched, so that she, too, may go into the water with her paddles in motion.

To be continued.

From the Glasgow Practical Mechanics' Journal.
Improvements in Forging Iron.

BY JAMES NASMYTH, ESQ.

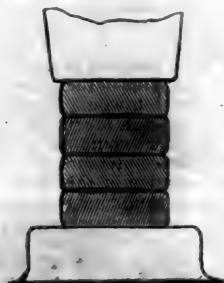
Continued from page 613.

Mr. Nasmyth next proceeded to describe the second part of his improvements in forging iron, which consist of means of producing sound boiler plates. He perfected the description of his improvements on this truly important subject, by detailing the nature of the most frequent cause of unsoundness of iron forgings generally, and in boiler plates in particular, namely, the imperfect expulsion of the molten oxide of iron or scoria, or cinder as it is termed, which, in every case of welded hot iron, covers and clings to the surface of the metal, and if left, interposing between the welded surfaces, is certain to occasion a defect, greater or less, according to the surface of junction it occupies. The frequency of this interposing scoria, as the true cause of unsound forged work, was forcibly alluded to, and shown to be the most fertile source and cause of the failure of wrought iron work, resulting, as such too frequently does, in the most sad and disastrous accidents, such as the failure of the links of chains and anchors, and in the costly and often distressing casualties arising from defective or blistered boiler plates. With respect to the links of chains, he mentioned, as the result of an extensive series of experiments on the strength of chain cables, on which, as a member of the committee on metals, he was employed by the Admiralty, that out of every ten cases of fracture, eight were occasioned by defective welding, as evinced by the appearance of the surfaces, showing that the oxide or scoria had not been duly expressed.

Mr. Nasmyth further described the condition absolutely requisite to perfect welding, namely, not merely that the surfaces we desire to weld should be really welding hot, but also that, when brought into contact, no particle of the scoria, which inevitably clings to the metal while welding hot should be permitted to remain interposing between such surfaces. If such material is left interposing, we are certain to have defect and unsoundness to a greater or less extent as the result.

In order the more clearly to detail his improvements on this important subject, a colored drawing, representing the usual form and arrangement of a pile of slabs, such as are employed in forging, when welded together, a mass of iron from which boiler plates or bars of iron are rolled, was exhibited. Fig. 4 represents such a pile of slabs, which having been, as is generally the case, produced under the action of a large hammer and anvil, having flat—or, as is generally the case, slightly convex surfaces, cause the slabs so produced to have certain hollow or slightly concave portions of their surfaces, so that when piled one upon the other, as in fig. 4, the risk of having hollow spaces between

Fig. 4.
Hammer.



Anvil.

is almost certain. The hollow spaces are represented in the figure by the dark irregular lines between the slabs.

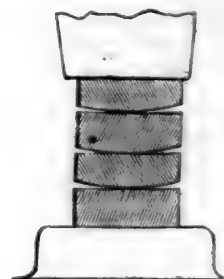
Referring to fig. 4, A and C represent a pile of four slabs laid on the anvil welding hot. Owing to the concave irregularities of the surfaces, the parts

most certain to come into contact first, are generally the exterior edges of the slabs. The effect of the blows of the hammer is first to weld the parts in natural contact; and, by continuance of the blows, the interposing scoria or cinder is expressed in a degree more or less perfectly, according to the energy of the blows, and the deepness of the convex or hollow patches between the slabs. So long as there exists an exit or passage for this scoria, all is well; but, as generally happens, some portion of this scoria lurks behind, after all chance of escape is removed by the welding of the exterior portion of the surface of the slabs. The result of this is, that we have, to a certainty, a defect greater or less in amount, according to the quantity or surface over which the enclosed scoria extends. Once such scoria is shut up between the surfaces of the slabs, no amount of after hammering will ever expel it, but, on the contrary, will only tend to its extension over a larger surface; and, as before said, so long as a particle of this scoria is left interposing, so long have we a degree of unsoundness in proportion.

Great as this evil is, and common as it is as a fertile cause of defective iron work, and the more especially so in the case of boiler plates, the means of avoiding such source and cause of defect is as simple as the results are important; and it is to be hoped, that the free and open communication which Mr. Nasmyth has made of his views on this subject, will be answered in the most acceptable way by the general adoption of the improvement. These improvements consist simply in so forming the surfaces which we desire to weld together, that a free exit may be preserved to the last, for the escape of the molten oxide or scoria, until the entire surfaces of the parts we desire to weld are thoroughly incorporated by the welding property, aided by the action of the hammer or rolls, as the case may be.

In order to accomplish this most important and desirable object, the surfaces of the slabs are made convex (see fig. 5,) by which most simple means a

Fig. 5.
Hammer.



Anvil.

perfectly free exit to the scoria or interposing impurity is maintained to the last moment—the welding commencing at the central part of the contact, A, and extending outwards towards the edges, under the action of the successive blows of the hammer or squeeze of the rolls; but, as before said, an open door is kept for the escape of the scoria, until the surfaces unite from the centre, A, to the outside edge, B B. Here, then, by an arrangement or formation of the surfaces, we have the most certain and simple means of procuring a solid sound mass of iron, which, when beaten, hammered, or rolled down to whatever thickness we desire, will retain to the last all the qualities of one sound solid mass.

From the Journal of the Franklin Institute.

INVESTIGATION OF THE COMPARATIVE MERITS OF THE PERPENDICULAR AND RADICAL PADDLE WHEELS FOR SEA-GOING VESSELS. By B. F. Isherwood, Esq., Chief Engineer U. S. Navy.

Continued from page 612.

If now, however, the paddles be made to enter, traverse and leave the water perpendicularly, the loss by oblique action is avoided; and if the centre of reaction (which will be as before, one-third the width of the paddle from the outer edge) have no slip, the portion of surface between it and the outer edge of the paddle having the same horizontal velocity, will operate no displacement. Furthermore,

by this arrangement, the same absolute paddle surface will propel with less slip than in the radiating paddle, by the difference between the projections of the surfaces horizontally, the perpendicular paddle having its whole surface acting, while the radiating paddle acts but by that surface multiplied by the cosine of the angle under which the paddle strikes the water. For equal slips, then, less absolute propelling surface is required in the perpendicular than in the radiating paddle.

As oblique action is avoided with the perpendicular paddle, and as the losses of labor occasioned by the radiating paddle are slip and oblique action, and as slip is affected by depth of immersion, and as depth of immersion with the radiating paddle is only restricted by the oblique action—it might be supposed, and has been so supposed by many, that the perpendicular paddle wheel could be immersed advantageously nearly to the axis. This is, however, far from being the case, and for the following reasons:—

With the radiating paddle wheel composed of a number of paddles set around on the periphery *radially*, their propelling efficiency depends on their *horizontal velocity*. Suppose a horizontal line drawn tangential to the lowest point of the periphery of the wheel, and from the centre of pressure of each paddle a perpendicular be let fall upon it, the distances between the intersections will represent relatively the horizontal velocities of the paddles. Now, it is evident that such paddles as have a *less horizontal velocity* than the velocity of the vessel, so far from propelling, carry a mass of water before them; this mass of water, however, occasions no further loss of labor than that due to its friction on the paddle surface and wheel shaft journals, (a very inconsiderable quantity,) because action and reaction being equal and in opposite directions, the reaction of this mass of water on the paddle produces a force acting at right angles to the radial paddle, equal to what was communicated to it by the paddle, and the reactionary force at *right angles* to the radii of the wheel turns the wheel, and the turning of the wheel propels the vessel.

But this is not the case with the perpendicular paddle, which turns an angle with the arm or radius at the extremity of which it is set; and the reactionary force of the mass of water carried forward by it being transmitted at right angles to the perpendicular paddle, that is, horizontally, and consequently obliquely to the radius or arm, instead of at right angles to it, as with the radiating paddle, the *whole* of the reactionary force is not applied to *turning the wheel*, but a revolution of it takes place, and only one component is applied at right angles to the radii to the turning of the wheel—the other component is applied in the direction of the arm or radius, and producing pressure on the shaft in that direction, is absorbed in retarding the advance of the vessel and in lifting it out of water.—The proportion of power producing motion in the wheel compared to that lost in retarding the advance of the vessel, and lifting it, will be as the cosine to the sine of the angle under which the arm strikes the water.

It is plain, then, that by increasing the immersion of the perpendicular paddle wheel until the horizontal velocity of the entering paddle is less than the velocity of the vessel, a loss of labor is experienced by part of the reactionary force of the mass of water carried before the paddle being expended in pressure on the shaft, instead of the whole of it being expended, as in the radial paddle wheel in turning the wheel. We therefore reach the economical limit of immersion with the perpendicular paddle, as far as the reactionary force is concerned, when the entering paddle has a *less horizontal velocity* than the velocity of the vessel. To have, then, a deep immersion with the perpendicular paddle wheel without encountering reactionary loss, it must be constructed with such amounts of surface as to give a normal slip for that immersion will determine the horizontal velocity of the entering paddle, and in order that the velocity of the vessel shall not exceed this, the paddles already in the water, and having from their positions greater horizontal velocities, must have correspondingly greater slips, in order that none of the reactionary force upon the wheel be lost; but in practice, it will be found proper to ascertain the minimum of all the

losses; that is, the minimum of the losses by the deficit of the reactionary force and by the slip of the paddles.

With a paddle wheel of 28 feet extreme diameter and 54 feet immersion, the slip of the centre of reaction must be about 33 1-3 per cent., in order that there be no loss of reactionary force by the entering paddle; that is to say, in order that the entering paddle carry no mass of water before it. If a slip of about 20 per cent. be given to such a wheel, the immersion must not exceed 34 feet, in order to fulfil the above requirement. Notwithstanding this, however, the loss of labor by the loss of a portion of the reactionary force is sufficiently small, with the deep immersions and slips found in practice, to allow a gain by the suppression of the loss by oblique action. Of course, actual experiment or calculation only can determine this amount and the conditions under which equilibrium obtains between the different losses and gains. Independently of the economical results that may arise from the use of the perpendicular paddle, in function of form, there are some important practical advantages connected with its use. The principal one consists in the fact, that a narrower wheel can be used with the same area of paddle, the only limit to the breadth of paddle being the depth of its immersion. In the "*Medea*," a vessel displacing over 100 tons, the paddle is 40 inches by 5 feet, because the acting movement of the paddle is wholly horizontal, and the slip is the same for the whole paddle as for the centre of reaction. With such a wheel, the proper proportions of paddle would be the greatest breadth permitted by the immersion; and as this would give an excess of propelling surface, were the usual number of paddles used, as is customary with the radiating paddles, this number can be reduced very considerably; so much so, in truth, that the paddles can be placed at such a distance apart as will allow only so much surface to be always in action as may be necessary to prevent too great irregularities of motion. This distance can be much greater than with the radial paddle. The paddles on opposite wheels should of course *break joints*, or alternate with each other, with a view to preserving this regularity of action. The practical advantages may be briefly summed up thus:—The wheel of equal propelling efficiency would have but about two thirds the weight of the ordinary wheel, and half its width, diminishing the leverage upon the guard timbers and the strain upon the ship. By reason of the greater narrowness, there would be in the rolling of the ship less depression of the leeward and less rising of the weather paddle, with of course less irregularity of motion than with the radiating paddle. By avoiding the oblique action of the radial paddle, a very destructive strain upon the ship is also avoided, for the practical effect of the oblique action of the radiating paddle is to forcibly tear the sides from the bottom of the ship.

Let us consider generally the greatest loss of the reactionary force that will occur with the paddle in its most unfavorable position. That position will evidently be the one occupied by the entering paddle, because the obliquity of the radius of the wheel to the surface of the water is here greatest.—In the deepest immersions this obliquity does not exceed 45 degrees. Taking it then at 45 degrees, and supposing the paddle in a vertical position at the end of the arm, and supposing the horizontal speed of the paddle less than the speed of the boat; there would be a resolution of the reactionary force upon the arm or radius of the wheel into two equal portions, one of which would be at right angles to the arm, and utilized in producing rotary motion in the wheel; the other would be in the direction of the arm, and produce pressure on the shaft;—at the shaft, a new resolution of this half of the original reactionary force would take place in two equal portions again; one of which, or one-quarter of the original reactionary force, would be opposed to the motion of the vessel directly in line of keel; the other, at right to the first, would lift the vessel, and consequently be utilized in decreasing the immersion amidship section and displacement of the vessel. This result, however, is too small to be appreciable in practice, and is proved to be so from the fact that the caps of the outward pillow blocks of the shaft are not pressed down to bear on the top of the shaft journal, but have generally a clear space of half an

inch or more left between. Indeed, in many steamers there are no caps at all to these pillow blocks. It is evident now, that with this arrangement, were the action of the lifting force appreciable in raising the vessel, the shaft would be lifted out of its outward pillow blocks; but observation shows that it has no perceptible lifting at all. The vertical resistance of the water is so small compared with the resistance of the weight of the wheel, shaft, &c., that the power expended vertically, displaces the water instead of lifting the vessel. As far then as practical results are concerned, the lifting force cannot but be considered as lost labor. We find, then, that even in the most unfavorable case occurring in practice, the loss with the perpendicular paddle is the sum of the reactionary and lifting forces, which being 25 per cent. each, make a total of 50 per cent.

Mobile and Chicago Railroad.

AN ACT granting the right of way, and making a grant of land to the states of Illinois, Mississippi and Alabama, in aid of the construction of a railroad from Chicago to Mobile.

Be it enacted by the Senate and House of Representatives of the United States of America, in Congress assembled, That the right of way through the public lands be, and the same is hereby granted to the state of Illinois for the construction of a railroad from the southern terminus of the Illinois and Michigan Canal to a point at or near the junction of the Ohio and Mississippi rivers, with a branch of the same to Chicago, on Lake Michigan, and another via the town of Galena, in said state, to Dubuque in the state of Iowa, with the right, also, to take necessary materials of earth, stones, timber, &c., for the construction thereof: Provided, That the right of way shall not exceed one hundred feet on each side of the length thereof; and a copy of the survey of said road and branches made under the direction of the Legislature, shall be forwarded to the proper local land offices respectively, and to the General Land Office at Washington City, within ninety days after the completion of the same.

Sec. 2. And be it further enacted, That there be and is hereby granted to the state of Illinois for the purpose of aiding in making the railroad and branches aforesaid, every alternate section of land designated by even numbers, for six sections in width on each side of said road and branches; but in case it shall appear that the United States have, when the line or route of said road and branches is definitely fixed by the authority aforesaid, sold any part of any section hereby granted or that the right of pre-emption has attached to the same, then it shall be lawful for any agent or agents to be appointed by the Governor of said state to select, subject to the approval aforesaid, from the lands of the United States most contiguous to the tier of sections above specified, so much land in alternate sections or parts of sections, as shall be equal to such lands as the United States have sold, or to which the right of pre-emption has attached as aforesaid, such lands being equal in quantity to one half of six sections in width on each side of said road and branches, the state of Illinois shall have and hold to and for the use and purpose aforesaid: Provided, That the lands to be so located shall in no case be further than fifteen miles from the line of the road. And further provided, The construction of said road shall be commenced at its southern terminus, at or near the junction of the Ohio and Mississippi rivers, and its northern terminus upon the Illinois and Michigan Canal simultaneously, and continued from each of said points until completed, when said branch roads shall be constructed, according to the survey and location thereof: Provided further, That the lands hereby granted shall be applied in the construction of said road and branches respectively, in quantities corresponding with the grant of each, and shall be disposed of only as the work progresses, and shall be applied to no other purpose whatsoever. And provided further, That any and all the lands reserved to the United States by the act entitled, "An act to grant a quantity of land to the state of Illinois, for the purpose of aiding in opening a canal to connect the waters of the Illinois river with those of Lake Michigan, approved March second, eighteen hundred and twenty-seven," be and the same are hereby reserv-

ed to the United States from the operation of this act.

SEC. 3. *And be it further enacted*, That the sections and parts of sections of land which by such grant, shall remain to the United States, within six miles of each side of said road and branches, shall not be sold for less than double the minimum price of the public lands when sold.

SEC. 4. *And be it further enacted*, That the said lands hereby granted to the said state shall be subject to the disposal of the Legislature thereof, for the purposes aforesaid and no other; and the said railroad and branches shall be and remain a public highway, for the use of the government of the United States, free from the toll or other charge, upon the transportation of any property or troops of the United States.

SEC. 5. *And be it further enacted*, That if the said railroad shall not be completed within ten years, the said state of Illinois shall be bound to pay to the United States the amount which may be received upon the sale of any part of said lands by said state, the title to the purchasers under said state remaining valid; and the title to the residue of said lands shall re-invest in the United States, to have and hold the same in the same manner as if this act had not been passed.

SEC. 6. *And be it further enacted*, That the United States mail shall at all times be transported on the said railroad, under the direction of the Post Office Department, at such price as the Congress may by law direct.

SEC. 7. *And be it further enacted*, That in order to aid in the continuation of said central railroad from the mouth of the Ohio river to the city of Mobile, all the rights, privileges, and liabilities heretofore conferred on the State of Illinois, shall be granted to the States of Alabama and Mississippi respectively, for the purpose of aiding in the construction of a railroad from said city of Mobile to a point near the mouth of the Ohio river, and that public lands of the United States to the same extent in proportion to the length of the road on the same terms, limitations and restrictions in every respect shall be, and is hereby granted, to said States of Alabama and Mississippi, respectively.

HOWELL COBB,

Speaker of the House of Representatives.

WILLIAM R. KING,

President of the Senate pro. tempore.

MILLARD FILLMORE.

Approved September 20, 1850.

Catasauqua, Pennsylvania.

In 1839 several enterprising citizens of Philadelphia, determined to erect a furnace for the manufacture of anthracite iron, a process which had then been only recently discovered and brought into use by Mr. Crane, in England. They selected a piece of ground on the line of the Lehigh canal, three miles above Allentown, in Lehigh county, in which iron ore of excellent quality and limestone were found in close proximity. Late in 1839 the timber was cut from the ground, and in 1840 a furnace was erected capable of producing 4000 tons of pig metal annually. During that summer we visited the place and found the furnace had just been blown in. Three or four houses had been erected that year and several others were in progress for the workmen, being the only buildings within some distance of the place. The experiment succeeded, and under the tariff of 1842, the proprietors erected that year another furnace to produce 5000 tons, and another in 1846, propelled by steam, of 7200 tons. In 1849 two additional furnaces of 8000 tons each were commenced, which were completed early in 1850, and put into blast. These works all belong to the same proprietors, the "Crane Iron Co."—During a summer excursion we visited this place in July last, and found it had become a large town, erected entirely for those dependant upon and engaged in these works.

This is another evidence of the advantage of encouraging our home manufactures. Under the

present tariff, enacted to benefit *Great Britain*, all our furnaces, except those advantageously located, must stop, unless prices advance, and nearly all the rolling mills have already suspended operations, by which suspension thousands of hardy and industrious mechanics have been thrown out of employment.

We have obtained from the late census returns the following interesting particulars in relation to this place, which in October, 1839, was covered with forest trees. Adjoining it is Buryport, of which we have not received the census returns.—It, too, is dependant upon these furnaces for employment, and contains a population of 400 or 500 persons, principally employed in these works.

	No. of men employed.	Number of horses.	No. persons dependent.	Number of children.
At works.....	178	25	561	230
At mines and hauling.....	143	174	432	212
" in New Jersey.....	40	20	140	60
Miners in coal.....	120	30	320	140
Limestone quarry.....	16	14	40	16
Coal boatmen.....	32	24	80	16
Ore boatmen.....	26	13	55	13
Iron boatmen.....	34	34	85	34
Total.....	589	334	1713	721

The whole population of Catasauqua is 885, viz: 245 from Ireland; 68 from Wales; 32 from Germany; 9 from England; 4 from Scotland; and 527 were born in the United States. Number of houses 154. Cost of ore, coal and limestone consumed \$250,000. In 1850 the product of these furnaces will be 25,000 tons.—*Philad. Com. List.*

Ohio.

The Railway Loans Settled.—The City Council on Friday night acted finally upon the propositions to loan the credit of the city in aid of the construction of various railways, to connect with the city. We understand that there were five applications for aid before the council, and the council has wisely, we think, determined to submit four out of the five to a vote of the electors at the annual elections. The total amount of aid proposed by council is one million of dollars, to be divided as follows:

To the Ohio and Mississippi railway.....	\$600,000
Hamilton and Eaton.....	150,000
Belpre.....	150,000
Covington and Lexington.....	100,000

In all.....\$1,000,000

The St. Louis appropriation was agreed to by a vote of 25 to 8; the Hamilton and Eaton by a vote of 26 to 7; the Belpre by a vote of 28 to 5; and the Lexington by a vote of 25 to 8.

This almost unprecedented unanimity in council, in favor of these loans, we think reflects the feeling of the people, and indicates a like unanimity in the final vote of the electors. We think a decided majority will be polled in favor of the loans, and that such a vote will be right and proper. Council has at last done its duty in submitting these propositions to the vote of the people—and this has been done deliberately, and with reasonable fairness. Let this fair action in council be followed by a deliberate and fair vote of the electors, and we have no doubt what the result will be—no doubt that the city will make the loans proposed to each and to all the roads named.

The rejection of the proposition of the Connersville company, was occasioned, as we understand,

more by considerations growing out of their imperfect organization, their uncertain preliminary surveys, and the want of information of the amount raised on that line, by the subscription of individuals to its stock, than to any settled conviction of the inutility of a railway on that line. Some few regard the line to Indianapolis and the Northwest, as a rival to the St. Louis or Southern line. We are not among those. We look upon both as important. We believe that on both lines good roads can be, and will be ultimately, constructed—that there is business enough for each, without interference or rivalry—and that both are important to the trade and interest of the city. Let this company complete their surveys, and increase the subscription of individuals along the line to their stock—let them ascertain what they can do themselves, and if they fall short and really need the aid of the city to enable them to prosecute a work shown to be useful and profitable, they will be able to present their claims to the city with a good prospect of success. And we hope no friend of this road will oppose either of the loans now to be voted for by the electors. Such opposition will be injurious to the interest of the city, and put an end to all hope of city aid to that company.

No one can question the importance of either of the roads we are now asked to aid, nor will any one believe that too large a sum is proposed for either. Let us then respond to the call of council readily, cheerfully, with heart. Let us grant the aid required.—*Cincinnati Gazette.*

Ohio.

Cincinnati, Hamilton and Dayton Railroad.

The work on this important line of road progresses rapidly though quietly. Operations on the line were slightly interrupted by the cholera, but there is now a large force actively engaged on it. The contractors are very energetic, and there is a moral certainty that the cars will be running from this city to Hamilton, early next season. The iron, the heavy T, is on the ground, ready to be laid down as soon as the grading is completed and settled, and the masonry shall be finished. The *Pioneer* locomotive is already finished by Mr. Harkness, and a splendid one it is. It will be immediately placed on the track to facilitate the work. The difficulties, at one time so threatening, relating to the right of way on this road, have been removed, and there is nothing now in the way of a speedy completion of this part of the line, in the very best manner.

The line between Hamilton and Dayton is all contracted for by the most able, experienced and energetic contractors, and they are working a large and efficient force on various parts of it. There is little doubt now, that in the course of the next season, the road will be finished and in full operation the whole way to Dayton. It is designed to have the road between this city and Dayton *the best in the United States*—one on which you can make the greatest speed with the least wear or danger from grades or curves.

A line of the same character is about being finished from Dayton to Springfield, connecting this city by way of Dayton, with the lakes. The railway from Hamilton by way of Eaton to Richmond, Ind., is in rapid progress, and with the aid of the city, will all be completed during the next year.—This will connect the rich country along its line with Cincinnati, by the Hamilton road. The coming business of the lower Miami valley, will greatly enhance the value of real estate.

This great work—for the railway from this city to Dayton really is a great work—was commenced, and has thus far been carried on by individual enterprise and capital. Not a dollar of stock has been taken by the city or by any public body. The whole has been taken as an investment, by men of capital and judgment, who know well where to look for good and certain profits. In securing this stock they have made an investment where the dividends must, inevitably, be large and certain. Every payment, by subscribers on stock in this road, draws 8 per cent. per annum interest until the road is completed. After the cars are on the road, stockholders will receive dividends instead of this interest; and, liberal as is the interest, we shall be more mistaken than we ever were, if the regular annual dividend on this stock is not larger. The capitalist who shall hold this stock, has an investment which must be undoubtedly safe in all time to come, and which cannot fail to yield a large dividend.—In this there can be no mistake.—*Cin. Gaz.*

Virginia.

We learn from the Farmville Republican that the board of directors of the Southside railroad co. determined at a late meeting to make Farmville a point in the line of their road to Lynchburg, on condition that the town and its vicinity would subscribe the sum of one hundred thousand dollars.—The editor urges upon the people of that section to raise the amount, and depicts in very warm colors, the immense advantages that would result to them in the event of the construction of the road.

While our sister town of Petersburg is making such strenuous efforts to promote her own interests, by securing the vast trade which the Virginia and Tennessee road will pour into Lynchburg, does it not behoove Richmond to be on the alert, and take care that she is not outstripped in the race by her weaker competitor? There is much reason to believe that a railroad connection will soon be established between Petersburg and Lynchburg, and should this occur, it will give her an advantage at the start, which we may find it difficult to overcome. A road from Lynchburg to some convenient point on the Richmond and Danville road, is essential to place us upon a footing of equality in the competition for the immense trade and travel of the southwest. Speedy and concerted action should at once be had among its various friends, preparatory to a successful application to the Legislature next winter for a charter. Southwestern Virginia has exhibited a friendly co-operation, which if met by a corresponding spirit here, will secure the construction of a work equally beneficial to Richmond and the state at large. It would be very unfortunate for our city, if the capitalists here should permit the scheme to perish for the want of proper aid and encouragement.—*Rich. Whig.*

Railroad Iron.—The president and directors of the Orange and Alexandria railroad company, have made a contract for the delivery of 2,500 tons of rails, of the bridge pattern, designed for the middle section of the road, similar to those already purchased for the eastern section. This will complete the road to Culpepper Court House. The price paid for this iron is \$38 per ton of 224 lbs. It is manufactured in Great Britain, and will be delivered in Alexandria.

New York.

Eric Railroad.—The traffic on this road for September is as follows:—

Passengers and mail.....	\$87,117 68
Freight.....	62,899 89

Total.....	\$150,017 57
September, 1849.....	77,688 45

Excess in 1850.....	\$72,329 12
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The aggregate receipts from January 1 to September 30th, were.....	\$1,139,595 27
Same time, 1849.....	526,088 94

Excess in 1850.....	\$612,906 33
Equal to nearly 120 per cent.	

Attica and Hornellsville Railroad.—There is no longer any doubt of the speedy completion of the railroad from Attica to Hornellsville. The committee appointed by the new stockholders to complete arrangements with the former board of directors, accomplished their object on Friday last, and subsequently elected the following gentlemen as the new board:—A. D. Patchin, R. H. Heywood, Buffalo; J. G. Hoyt, B. R. Folsom, Attica; I. C. Bronson, Warsaw; G. B. Chase, Castile; M. Woodruff, Gainesville; H. O. Brown, Genesee Falls; B. Bagley, Nunda; S. Swain, Jr., Portage; John Smith, Burns; Judge Bailey, Hornellsville; J. S. Wadsworth, Genesee.

A meeting of the directors will be held in Warsaw on the 9th of October, at which arrangements will be made for putting the road under contract immediately.—*Buff. Com.*

Maryland.

Baltimore and Ohio Railroad.—The board of engineers appointed by the executive of Virginia, to determine the matters in dispute between the city of Wheeling and the Baltimore and Ohio railroad company, have decided that the Grave Creek route is the true and proper route under the law of 1847, and the agreement with that city. By this decision, the point at which the road will first strike the Ohio river will be the mouth of the Big Grave Creek, twelve miles below the city of Wheeling. The road is now under contract from that point; and the remaining forty miles heretofore suspended will be put under contract immediately, when the whole line will be in the hands of contractors.

Connecticut.

New Haven and New London Railroad.—At a meeting of the citizens of New Haven, held at Boardman's Hall, Thursday evening, September 12th, 1850, for the purpose of hearing the report of a committee appointed to report upon the New Haven and New London railroad, and for the purpose of devising measures for the sum allotted to the city of New Haven towards the subscription for building said road, Hon. William W. Boardman was called to the chair, and Henry G. Lewis, Esq., appointed secretary. Ralph D. Smith, Esq., from the committee, made a report, showing the cost of the road to be \$1,200,000, and the receipts \$263,000, from local business of the road only, with many other interesting particulars, which will be laid before the public hereafter. The meeting was further addressed by Messrs. Boardman, Skinner, Smith, Griffin, and resolutions passed approving of the project, and a committee, consisting of the following persons, appointed to receive subscriptions:

Wm. W. Boardman,	James Brewster,
A. N. Skinner,	John S. Griffin,
Caleb Mix,	Timo. Dwight,
J. B. Carrington,	N. A. Cowdrey,
H. G. Lewis,	E. A. Mitchell,
Benj. Noyes,	John S. Graves,
Elias Pierpont.	[Palladium.]

New Brunswick

The Railway.—It appears that the government of Nova Scotia think of undertaking the railway on Provincial account. By this means, certainly the expenses, like the benefits, fall on the whole community, and "all hands" are forced to contribute to the common good.

We learn that the directors of the Dublin and Galway railway have taken the matter up warmly, as indeed was to have been expected, for the scheme offers as many advantages to Ireland as to New Brunswick and Nova Scotia.

We learn that the subscription for stock is progressing in quite a satisfactory manner—not fast enough, of course, to satisfy the sanguine, but as fast as is consistent with a prudent forethought as to "ways and means." Our folks have not been accustomed to the large sums required for such an undertaking, and have to think twice before sub-

scribing. All those, however, from whom public spirit could have been expected, or who were supposed to have common sense enough to "throw a sprat to catch a mackerel," are coming to the front with larger amounts than any one counted on.—Those who have the best means of knowing, calculate that the subscriptions for this city will come well up to £100,000.

It is the general opinion, that if the legislature of Nova Scotia is called together, ours also ought to meet, as it is of great importance that the question of charters, grants, and aid, should be speedily settled.—*St. John Courier.*

Maine.

Kennebec and Portland Railroad.—By an act of the Legislature of this State, at its last session, several of the most important towns upon the line of this road were authorised to loan their credit to the amount of \$800,000 for its completion. The vote of the towns that have already acted under this law is as follows:

	Yea.	Nay.	Amount voted.
Augusta.....	908	47	\$200,000
Gardiner.....	641	313	150,000
Bath.....	645	181	200,000
Hallowell.....	363	178	100,000
Brunswick.....	588	252	75,000
	3145	971	\$725,000

In the aggregate more than three fourths of the votes are in the affirmative.

The towns of Topsham, Bowdoinham and Richmond are to supply the balance, which we learn they will do without a doubt.

In relation to this loan the Kennebec Journal says:

As the town and city scrip to be issued will run twenty years, the money can undoubtedly be obtained upon it at 5 per cent., and perhaps lower.—Had the company been obliged to raise it upon personal security or upon a mortgage of the road, 10 or 12 per cent. must have been given. The difference between 5 and 10 per cent. on \$800,000 is \$40,000 annually—a sum which will now be saved to the company; and by this favorable arrangement the stock is rendered of present and increased value to its owners, and the small stockholders are saved from the necessity of sacrificing their shares. The towns and cities are amply secured. It will require a gross receipt of only about \$75,000 per annum from the business of the road to pay a net profit of \$40,000, which is sufficient to pay the interest. We think the receipts will double that.

Maryland.

Wheeling and Baltimore and Ohio Railroad.—Under a law of this state, passed in March, 1847, and a contract between the city of Wheeling and the Baltimore and Ohio railroad company, made in July of the same year, that railroad company became bound to construct their road to Wheeling, and to fulfil certain conditions as to the route near the western terminus. The company proceeded to make surveys, and adopted a route touching the Ohio river at the mouth of Fish Creek, twenty-three miles south of Wheeling. The city insisted that such a route would be injurious to her, and was not in accordance with the law and agreement. A controversy arose and was finally brought before the legislature at its last session by the city of Wheeling. The General Assembly passed an act authorising the governor to appoint a board of competent and experienced engineers to decide upon the matters in dispute.

The Governor performed that duty with admirable judgment. The board consisted of Professor D. H. Mahan, of the West Point Military Academy, Major M. Lewis Clarke, of Missouri, and Wm. Raymond Lee, Esq., of Massachusetts—all gentlemen of the highest character for scientific attainments, capacity and integrity. They, have, within the last few days, unanimously decided the controversy in favor of the city of Wheeling.

The discussions of engineering questions which

were laid before the board by Benjamin H. Latrobe, Esq., Chief Engineer of the company, and Charles Ellet, Jr., Esq., Civil Engineer, for the city, are said to have been in the highest degree creditable to the learning and ability of those distinguished gentlemen. Printed arguments were also presented to the board by the counsel of the parties—J. H. B. Latrobe, Esq., for the company, and Charles M. Russel, Esq., of Wheeling, for that city.

Mr. Ellet had the assistance of the eminent engineer, Jonathan Knight, Esq.; and in the course of the controversy, a learned and lucid opinion upon the professional questions was written and published by J. H. Alexander, Esq., of Baltimore, Civil Engineer, at the request of Wheeling.

The subject has engaged the constant attention of the board for about three months, and their decision of this interesting and highly important issue, will command the active confidence and respect of the state and the public. The effect of it will be to require the company to construct their road by way of Grave Creek, so as to strike the Ohio river near Wheeling, and to secure to that city the benefits of the western terminus. It is of the first importance to the flourishing metropolis of Northwestern Virginia, and to the interests of this commonwealth. It will be very gratifying also the friends of Mr. Ellet, whose opinion on the subject was before the Legislature last session, and who has since sustained the views then presented by papers of a more scientific cast, which prove him to belong to the highest class of his profession.—*Richmond Whig.*

Ohio.

A mass meeting of the citizens of Gallia county, Ohio, and the Kanawha region in Virginia, will be held at Point Pleasant Virginia, on the 2d of October, to consider the feasibility of extending the Central Virginia railroad through the valley of the Kanawha to Gallapolis, and thence via Jackson and Chillicothe to the interior of Ohio.

Georgia.

The Savannah Republican, in an article upon the capacity of the South for increased production of cotton, says:

It appears to us that these apprehensions overlook the immense capacity of the South to increase her culture of cotton. A prodigious quantity of fine lands in the South yet remain in a state of nature, and the laborers are growing up to work them. The State of Georgia alone is capable of making up a very large fraction of the existing deficit, and she has an immense extent of excellent land for the production of cotton, on which the primeval forests still stand. Add to this that her old and neglected fields are now fast being reclaimed, and that many a fire is re-lighted on long deserted hearth stones. These facts conduct us to one source of increase not yet sufficiently appreciated, neither at home nor abroad. The railroads of Georgia have given an astonishing impulse to production. It is through accessibility to markets, through her railroads, that she has attained to such a proud ascendancy over other Southern States. Within two years and a half at the most, Georgia alone will have more than 300 additional miles of railroad added to her present roads, and penetrating regions of almost incalculable ability to produce cotton. As the figures look large to some, we will specify these roads.—They are:

South western railroad,	52 miles.
Savannah and Augusta railroad,	51 "
Milledgeville and Gordon railroad,	17 "
Eaton road,	22 "
Muscogee railroad, from Columbus to the point where it intersects the Southwest-ern,	72 "
Atlanta and West Point railroad,	86 "

In all,

300 miles. And yet we have not told all, for we have neglected to add the Wilkes County railroad 23 miles, and that portion of the Georgia and East Tennessee road lying within the borders of Georgia. Nor have we adverted to the Griffin and other plank roads in progress or projected.

But Georgia does not stand alone. The march

of improvement has overstepped our borders and is penetrating those cotton growing States to the west and north of us. The Girard and Mobile road alone will bring into cultivation one of the largest and best cotton regions in the South, hitherto overlooked, or rather lying neglected by reason of its remoteness from a market. Every where in the South there are indications of an increased production of cotton.

Canada.

Toronto and Huron Railroad.—On Saturday we stated that a number of influential individuals had subscribed large sums in addition to the sums for which they may be made liable for their proportion of the proposed tax on the city, if it should be adopted. In addition to that list we give the following: J. H. Cameron, Strachan, Allan, Vankoughnet, Haworth, J. C. Bettridge, Betley & Kay, H. Fowler, M. P. Hays, John Arnold, James McDonald, M. Rossin & Brother, J. G. Joseph, Patton & Co., John Robertson, J. Henderson, J. W. Skelton, A. & S. Nordheimer, J. Watson & Co., G. Duggan (free gift), John Salt—making in all upwards of £7,000. After such a list as this on the part of the citizens, the least we can expect to be able to communicate in our next, is a very liberal subscription from the directors themselves, in order to meet the citizens half way. If that is done, the success of this line of railroad will be placed beyond doubt.—*Colonist.*

Pennsylvania.

Lebanon Valley Railroad.—The prospect of organizing a company to construct this road, not very flattering heretofore, appears to be brightening. A meeting of gentlemen interesting in prosecuting the work was held in this city a week or so ago, at which measures were taken to authorise an immediate survey of the route. Engineers, it is said, are engaged, who will commence a survey forthwith, and in a month or so more we may look for their report, estimate of the probable cost, etc. At the meeting referred to, the opinion was expressed by Mr. Tucker, the able and energetic President of the Reading road, that passengers could be put through from Philadelphia to Harrisburgh, via Reading and Lebanon, in three hours and a half. This is considerably less than the time now required on the Lancaster route, and as the route by the Schuylkill and Lebanon valleys would be vastly preferable in other respects, a heavy business might be safely calculated upon.—*Reading Journal.*

Growth of the West.

As an evidence of the rapid growth of Wisconsin, we give a table showing the increase in Rock Co. since 1840.

In June, 1840, the population was,	1,700
In July, 1842, "	2,857
In June, 1846, "	12,405
In Dec., 1847, "	14,729
In June, 1850, "	30,869

The population of the town of Janesville, county seat of Rock county, is put down at 3,343.

Indiana.

The Indianapolis and Bellefontaine railroad will be completed and the cars running from Indianapolis to Pendleton, 26 miles, on the 8th of this month. The occasion of opening the road is to be celebrated at Pendleton on that day.

The Shelbyville and Rushville branch railroads have recently been opened with much eclat, with ceremonies suited to the importance of the occasion. These penetrate a very excellent agricultural section, and will constitute important feeders to the Madison and Indianapolis railroad. The completion of every railroad in this State, by rendering available the resources of the people, instead of exhausting, furnishes them with additional means

for the construction of new lines. Indiana is now fairly under weigh, and will continue the building of railroads till every county shall possess this mode of conveyance.

Maine.

Androscoggin and Kennebec Railroad.—At a meeting of the stockholders of the A. and K. railroad company held at Winthrop on Monday last, it was voted, on motion of Mr. Crane of Boston, to issue bonds to the amount of one million dollars, and offer the same in the market of not less than eighty-five cents on the dollar, to relieve the company from its present embarrassments. The business of the road we learn is rapidly increasing, and bids fair in time to pay a fair dividend upon its cost.

Ohio.

During the present month, the Cleveland and Columbus railroad will be open to Shelby county from Cleveland, where it connects with the Mansfield and Newark road. The Cleveland road is now opened to Wellington. The whole road will be open by the 31st December, forming a connection between Lake Erie and the Ohio river.

Tredegar Iron Works, Richmond, Va.

The above are among the leading works in the Southern States for the manufacture of machinery and equipment for railroads. As far as the cheapness of the raw material, iron and coal, are concerned, none can be better situated; many of the Virginia iron ores being of a very superior quality, and the Chesterfield coals being within a very few miles of Richmond. This city, too, is on the line of the great railroad leading south, and occupies a very favorable position, as far as transportation is concerned, for supplying the southern market.—The completion of the Virginia and Tennessee railroad will further enlarge the sphere of her influence. Without encouraging local or sectional feelings, we are desirous of seeing the south encourage the works situated in their midst. Such encouragement in the outset is necessary till time shall give them the experience of those who have been there in the business. The south is particularly fitted to become a great manufacturing region, and the increased outlay required for a start should be encouraged by the liberal patronage of those who are to derive important advantage from them.

Nashua Iron Company, (N.H.)

The attention of those interesting in railroads or railroad machinery, is invited to the advertisement of the above company, in another part of our paper. We are assured by the builders of Machinery that all the articles manufactured by this company are of the best quality; no pains being spared to procure the best material, and to have their work done in a thorough manner. Upon the quality of the articles manufactured by this, and companies similarly employed, depends the safety and lives of travellers; and the dreadful accidents which have been so frequent of late are directly referable to the faulty quality or make of the article used.

The above company's works are located at Nashua, near the junction of the Worcester and Nashua railroad with the great northern chain of roads, of which the Boston and Lowell, Lowell and Nashua, Nashua and Concord and Northern railroads, are the lower links. A branch track into their yard connects their works with these roads, and thus gives them the utmost facility and economy of transportation in any desired direction. Their works are on a large scale, and are able to turn out twenty locomotive tires per day, besides all their

other work. They have been in operation and their work has been tested some two years, and has in no instance failed to give entire satisfaction.— They have been, and are now making tire and other work for the Boston and Lowell, Lowell and Nashua, Nashua and Concord, Northern, Vermont Central, Ogdensburg, Passumpsic, Boston and Montreal, Manchester and Lawrence, Boston and Worcester, Western, Boston and Providence, Old Colony, Fall River, Boston and Fitchburg, and in fact for nearly every road in New England, and many Western and Southern roads, in addition to a large amount manufactured for the leading locomotive shops in Massachusetts, to whom, as well as to the railroad companies named, the company refers for the quality of its work.

AMERICAN RAILROAD JOURNAL.

Saturday, October 5, 1850.

The rapid development of our mineral resources is one of the most marked features in the progress that our country has made for the past ten years. Our superiority over the countries of Europe in the extent and value of our mineral wealth is as decided as are our agricultural capacities. With California, we are certainly much richer in minerals than any nation in the world; and we are soon to take the lead in the production of nearly all of the valuable metals, as we have already done in some of the leading agricultural staples.

In a few years more we shall not only produce all the copper we want for our own consumption, but we shall export largely to other countries. On Lake Superior, we have the richest copper mines in the world. Some of these mines will soon be able to turn out 1000 tons of copper each; and a small number of them will suffice for our domestic wants. In addition to these, copper is very abundant and is profitably worked in many other parts of the country, particularly in Missouri, where inexhaustible supplies are found, though from its remoteness, and from want of capital, the ores found there have been but little worked. There can be little doubt but that the increased supply, which a few years will furnish, will reduce the price, so as to introduce it into much more extensive use than it has at present obtained.

We have, in New Jersey particularly, inexhaustible supplies of the best kind of zinc ore. Preparations are now in progress to work these on an extensive scale, which will supply quantities of this useful article at a very low rate.

In gold we are now the wonder of the world. It has never shown anything to equal California in richness. That vast region is undoubtedly as rich in other minerals, equally useful, but not so attractive, which will, when the mania for gold digging abates, receive attention, and be profitably worked. This will undoubtedly prove to be the richest mineral region in the world.

Our lead mines in the West are as rich in their appropriate mineral, as California is in gold.— They are capable of indefinite production. In addition to these, lead ores are found in abundance in nearly every State in the Union, and all that is wanted is time to see them extensively worked.

Thus far we have found but little silver. But from indications, it will without doubt be found in abundance in New Mexico and California. The only valuable metal used to any extent in the arts, which we do not find here is tin. Thus far it is found only to exist in trace.

Our iron ores exist in inexhaustible abundance of the best quality. With regard to gold, lead, copper and zinc, the superior richness of our deposits puts us beyond the injurious influence of foreign competition in their production, which to some extent checks our progress in the iron manufacture. We are the second nation already in the extent of our production, and with a reasonable protection we shall soon become the first.

With our richness in the most valuable of the metals, we have vast coal fields scattered over the country. Modern science has rendered coal the great motive power of the world. It is this that gives value to our great mineral wealth, and prepares it for use. The nation that is without coal, (unless some new motive power is discovered) must always remain dependent upon those that possess it. In all the elements of wealth and power which are to be found in mineral deposits, we stand unrivalled. These are now being rapidly brought into use, and with their development our country is destined to take a new start and move on with a vastly accelerated speed.

The Money Market.—Prospects Ahead.

A very marked improvement has taken place within a few weeks in the stock market, and in the value of railroad securities. The great bulk of the securities in this market, are in the shape of bonds, which for the most part being unquestioned as to their soundness, are effected only as money is plenty or scarce. In Massachusetts, on the other hand, railroad investments are represented in the shape of stock, which derives its value from that of the road. In these there has been a very rapid advance, indicating both increased abundance of money, larger income from the roads, and greater confidence in this kind of property. From every quarter we have the most satisfactory evidence that railroads are fast regaining that place in the public confidence that they once held.

All this is very favorable to the great number of new roads in various parts of the country which are compelled to seek foreign aid in their construction. If the money had, during the past season, ruled as high in New York as Boston, thousands of miles of railroad now in successful progress, would have been discontinued; and an unfavorable condition of the money market for the next season would put a stop to the operations of a great many companies that are now going ahead with every prospect of success. The progress of the West is most intimately connected with the condition of things here. If we receive from it what constitutes the basis of our commercial greatness, we in turn loan back to that section our accumulated capital, for the purpose of enabling its people to develop to a still greater extent their vast resources.

Railroad securities can now be negotiated here on fair terms, and there appears to be every prospect that this state of things will continue. The high price of cotton, and the large probable demand for breadstuffs, will take care of our indebtedness abroad. The continued receipt of gold must make money plenty at home. In addition to the favorable state of things here, the success of our public works are attracting the attention of English capital. The stock of some of the best known of our roads are now sought after for investment, and all that is wanting is sufficient time to show the general goodness and safety of these securities to enable us to send them abroad for investment in large quantities.

In connection with this subject we give the fol-

lowing extract from a late money article in the London Times.

The position and prospects of the money market were never more singular than at the present moment. Everything is tending in a direction to produce striking changes in the relations of capital; but in the apathetic trance resulting from our late exhaustion, they are scarcely noticed. With an increase in the quarter's revenue of £518,000 over the favorable returns of last year, an augmentation in the declared value of our exports of between \$3,000,000 and £4,000,000 during the same period, a stock of bullion in the bank which has remained with slight fluctuations, at a larger amount than was ever before known; and the prospect thus far of an abundant harvest, there are also a number of more exceptional circumstances which furnish still greater inducements that a state of affairs is approaching which must awaken the best energies of the country, and which, if wisely watched, may give an impulse to the spread of civilization, such as has been witnessed at no former epoch. Each account from California not only confirms but adds to all previous anticipations of the growth of that territory, and of the success of those who have thronged to it, and the reflex action of those movements on other parts of the world are now beginning to manifest themselves with daily increasing force.

In the Sandwich Islands, in Australia, along the whole coast of the Pacific from Valparaiso to Vancouver's Island, and even in China, the stir is distinctly felt, and the awakening life thus manifesting itself at the extremities of the commercial system must soon be acknowledged most powerfully at its centre. Even if California were announced tomorrow to be a delusion, it would be years before the effects that have already been created by it would cease to operate; but the tidings received for a long time past have now convinced all persons that its riches have never been over estimated, and hence the inference is unavoidable that what has yet taken place is only the beginning of the changes to come. According to the recent accounts from New York it is confidently believed that the gold received in the United States during the next six months will exceed the total of all that has yet arrived. The silver mines of South America, too, are yielding a largely increased supply, railroads are being constructed for their further development, quicksilver is likely to be furnished in unusual supplies, and improved methods of working are resulting from the application of capital derived from the profits of trade with San Francisco. Coupled with these facts we have accounts of other gold regions in Bolivia, Venezuela and South Australia. The less noticed but steady increase in the supply from Russia has likewise to be borne in mind; and finally, the importation which is even now taking place from the substitution of paper and silver for the gold coinage in Holland, amounting, it is understood, to between £2,000,000 and £3,000,000.

Under all these circumstances, the rate of money in England is about 1½ per cent., and at New York, although they are now sending us large amounts of bullion by each steamer, it is also lower than it has ever been for any continuance, 3¼ or 4 per cent. being the highest rate that can be got for temporary loans. At the same time, two things have operated in England to prevent the glut of money being greater than it is. The remittances on account of the Russian loan of £5,000,000 and on the Danish loan of £800,000—the instalments on the first of these are now completed, and in the course of the next two months such small amounts as may remain on account of the second will also be discharged. There will consequently, as far as we can see at present, be henceforth nothing to disturb the existing tendency toward accumulation.

Step by step with this tendency the rate of interest to be obtained by capitalists must decline.— There is no over speculation in trade to prevent it, and no quarter of the world where the exchanges are likely to turn against us. The only questions, therefore, that present themselves are, first, as to the point to which the value of money will descend without overcoming the present horror of all other investments which involve risk; and secondly, in what quarter the vent will be found when the overflow of capital shall at last become irrepressible.

For the present we can look for no striking devi-

ation in the routine channels for the employment of money, and hence there will be plenty of time to watch the quarters to which it will ultimately rush. In the intermediate months there may be a variety of small gambling movements in some of the low-priced foreign stocks or shares, but nothing of a character that will not be limited and transitory. The old burns in that respect have become matter of history, and when the general impatience of 1 or 1½ per cent. as the rate of interest shall have gained its full force, a new field will be required for its development. It will then be found, that although the uses of capital had seemed to us to have narrowed to such a point as to render it almost valueless, such an idea was inconsistent with the onward course of affairs, that it was in fact merely the silly reaction from opposite delusions, and that although the opportunities for the employment of money were declining in one quarter, they were rising up with increased force in another. Among many new features, the growing wonders of the new world on the Pacific will at that date be rightly interpreted; and it will perhaps be seen that while we have thought all safe modes of adventure utterly exhausted, private individuals have been making large fortunes by running steamers, by working coal, by facilitating the transit of emigrants and merchandise, by testing new kinds of produce and means of cultivation, by building piers, and docks, and villages that are capable of becoming cities, and by all the other occupations that are opened up wherever a new population is suddenly attracted.

Central Railroad Line through New York and Canada.

The near approach of the completion of the Erie, and the lines of railroad along the south shore of Lake Erie, is turning the attention of the stockholders in the Central line in this State as it is termed, to the importance of taking every step in their power, to continue their line a successful rival of the more southern route. Very great improvements can be made by cutting off some of the long circuits now made, to accommodate large towns. From Syracuse to Rochester, the work of straightening is already in progress. From Rochester a road is to be constructed to Niagara Falls for the purpose of connecting with the Great Western of Canada, which will constitute the shortest possible route between Detroit and Western N. York. The line will also receive the support of the Michigan Central, which is interested in keeping the line of travel as far north as possible, to prevent its falling upon the Michigan Southern. With such interests at stake, and such powerful influences at work, we may expect that the whole line from Albany to Detroit will be put in the most favorable condition for the purpose of retaining as large an amount of business as possible. From Detroit westward it is proposed to run a branch from the Michigan Central to the mouth of Grand river, opposite Milwaukee. From this last point, the Milwaukee and Mississippi railroad will form the last link to the Mississippi river.

The portion of this line through Canada will, we presume, require some years to complete. It is a great work, is in the hands of one company, and will not command the support of the people through which it runs so entirely as it would if it were in charge of several companies. The Canadians, too, do not take up railroads with the same *con amore* as the "States." The roads we have named will furnish aid to some extent. What is expected from English sources we have no means of knowing. But it is a line possessing too much inherent strength to fail, and with the Provincial guaranty, which is available after one-half shall be completed, we may count upon its final construction as a certain event.

Bowling Tire Bars.

40 Best Flange Bars 5½x2 inches, 11 feet long.
40 " " 5½x2 " 7 feet 8 in. long.
40 " Flat " 6x2 " 11 feet long.
40 " " 6x2 " 7 feet 8 in. long.
Now in store and for sale by
RAYMOND & FULLERTON,
45 Cliff street.

Notice to Contractors.

CENTRAL OHIO RAILROAD.
SEALED PROPOSALS for the Graduation and Masonry of 36 miles of the Central Ohio Railroad, extending from the 24th section—three miles east of Newark to the City of Columbus—will be received until the 1st day of November next.

Also for the Bridging (being about 1200 lineal ft.) for the whole line from Zanesville to Columbus. Also, for 55,000 White Oak Cross Ties, deliverable along the line from Zanesville to Newark before the first day of May, 1851.

Also, for 72,000 White Oak Cross Ties, deliverable along the line from Newark to Columbus before the 1st of August, 1851.

Contractors proposing for the construction of Bridges may propose for plans furnished by themselves, as well as those furnished by the Engineer.

The line will be ready for examination by the 10th of next month (October.)

The bids will be received at the office of the Engineer in Newark, where plans will be exhibited, and specifications furnished.

Contractors unknown to the undersigned must produce satisfactory testimonials.

The amount of work involved in this letting is well worthy the attention of enterprising contractors. By order of the Board.

ROBERT MAC LEOD Chief Engineer.
Zanesville, Sept. 24, 1850.

P.S. A large number of laborers would find immediate employment and fair wages upon the portion of the line now under contract.

To Contractors.

ALABAMA AND TENNESSEE RIVER R. R.
SEALED Proposals will be received by the Directors of the Alabama and Tennessee River Railroad, at their office in Selma, until the 1st of November next, for the graduation, masonry and bridging of 56 miles of the Southern Division of said road, extending northwardly from Selma.

Plans and profiles may be inspected and specifications and information will be given at the office of the company in Selma, on and after the 15th of October next.

Twenty-six miles of this division were graded in 1839. This part of the division will require repairs to the road bed, and will be furnished anew with culverts and bridges.

The country embraced in this division is healthy, well watered, and possesses facilities for obtaining supplies of provisions.

Proposals may be based upon cash payments, or upon payments of a proportion, or of the whole of the work in stock.

The Directors reserve to themselves the right to accept or reject proposals as they may think proper for the interests of the company.

The Directors expect to have as much as twenty miles of the Northern Division, extending northwardly from the Coosa river in Shelby county, ready for examination by the 15th November, and for letting by the 1st December; and 30 miles more, ready for examination by the 1st and for letting by the 15th of January, 1851. It is likewise their intention to let out the grading, masonry and bridging of the remainder of the Southern Division and of the Northern Division terminating at Gadsden, with all possible despatch.

By order of the President and Directors.
LEWIS TROOST, Chief Engineer
Selma. Ala., August 30, 1850.

Rosendale Cement.

THE NEWARK AND ROSENDALE LIME AND CEMENT CO. are now manufacturing at their works in NEWARK, N. J., and Ulster county, N. Y., a very superior article of *Hydraulic Cement*—also *Lime Calcine Plaster*, etc. Contractors and dealers will find it to their advantage to call or make application before purchasing elsewhere. All communications addressed to the subscriber, at Newark, N. J., will be punctually attended to.

1y*18 HENRY WILDE, Secretary.

Railroad Iron.

THE Undersigned are prepared to contract for the delivery of superior make Welsh Railroad Iron of the favorite brand "Aberdare."

JOSEPH BRAMWELL & CO.,
40 91 Wall street.

Nashua Iron Co.,

NASHUA, NEW HAMPSHIRE.

MANUFACTURERS of Bowling, Pembroke and Lowmoor Locomotive Tires, Engine Frames, Crank and Car Axles, Wrought Iron Sheeting of all sizes, Shapes of all descriptions used in Machine shops and upon Railways.

FRANKLIN MONROE, Treasurer.

Messrs. Fullerton & Raymond, Agents, Boston.

" Raymond & Fullerton, " New York.

Orders received by the Treasurer at Nashua, N.H., or by the Agents in Boston or New York.

To Civil Engineers.

WANTED—A Practical Engineer, to be concerned in an Enterprise (a valuable Cannel Coal Mine) that will prove of great advantage to him, as well as those to be associated with him. A preference will be given to one possessing some means, to aid in the completion of the works now in progress, and to take an interest in the stock of the company, already incorporated. Communications addressed to B.G.L. at this office, with real name and address, will meet with immediate attention.

October 3, 1850.

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Great Work on Bridge Building, etc., etc.

JUST published in medium folio, One Dollar, 75 cts. to subscribers.

Part I. of a "THEORETICAL AND PRACTICAL TREATISE ON THE CONSTRUCTION OF BRIDGES IN STONE, IRON AND WOOD," By George Duggan, Architect and Civil Engineer.

The present part contains beautifully executed plans, elevations, sections, and centering, of the Bridge of St. Maixence, France, by M. Perronet, the eminent Architect and Engineer, and plans, elevations, sections, and details of the oblique Timber Bridge, 700 ft. long, constructed for a double track across the River Tyne, on the line of the Newcastle and Carlisle railroad, by John Blackmore, C. E., with an introductory article on the relative merits of the various materials employed in the construction of Bridges, as regards economy, strength and durability, and critical remarks on the various forms of bridges designed and constructed by the most eminent architects and engineers in Europe and America.

"PART VI. of Specimens of the Stone, Iron and Wood Bridges, etc., etc., of the United States Railroads," By George Duggan, Architect and Civil Engineer, contains specimens of the plates and letter press intended for the APPENDIX, being the commencement of a complete Treatise on the Theory and Practice of Bridge Building. This will be one of the most valuable works on the subject ever presented to the attention of engineers in this country—condensing the most important information on this branch of architecture contained in the writings of the most eminent scientific men in the French, German, Italian, and English languages, in the course of the last and present century. It will be illustrated by numerous accurate representations of bridges of the greatest celebrity in modern times. Elaborate articles will be given on the strength, property, and uses of the different materials employed, and on the most approved methods of constructing Coffier Dams, Foundations, Centering, etc., with descriptions and drawings of the various engines and Machines that were found most useful in constructing the works, and a selection of such specifications as may be of service to the practical bridge builder. The sixth number treats of the Application of Iron to Railroad Structures, and is illustrated by beautiful drawings of the Bridge across the Delaware at Saw Mill Rift on the Erie Railroad, and of the bridge over Fairfield street, on the Manchester and Birmingham Railroad. The great success of this work thus far is the best tribute to its scientific merit and its adaptation to the wants of the American engineer."—[New York Daily Tribune, June 23, 1850.]

Published by George Duggan, 300 Broadway, New York, to whom all communications should be addressed and subscriptions forwarded.

Parties remitting Mr. Duggan \$5. and the remainder \$4 when they have been supplied with the first six parts of the "Theoretical and Practical Treatise on Bridge Building, etc., etc." shall receive it monthly as published. To those making Mr. Duggan a present remittance of \$9, the work will be forwarded post free to any part of the United States.

Great American Engineering

AND MECHANICAL WORK, just published in medium folio One Dollar, 75 cts. to Subscribers. Part VII of "Specimens of the Stone, Iron & Wood Bridges, Viaducts, Tunnels, Culverts, &c., &c., of the United States Railroads." By George Duggan, Architect and Civil Engineer.

The present part contains beautifully executed plans, elevations, sections and details of the elegant timber Bridge, (Burr's Patent,) 150 feet span, across Salmon River, Malone, on the line of the Northern-Ogdensburg-railroad, and isometrical views of Bridges 30, 40, 60, 82 and 88 feet span on the line of the Utica and Syracuse railroad, with specifications, form of contract, &c., &c., for the Connecticut River railroad.

"It is a work that was a great desideratum, and must prove of great benefit to the engineering profession generally, and especially to the tyro in practical engineering and mechanical knowledge; in truth it strikes us, that it would require years of labor and patient toil on the part of a young engineer to prepare the drawings, and collect the information that will be embodied in this work, and can now be secured for the trifling sum of \$9."—[Scientific Amer. March 16, 1850.]

In connection with this subject (Iron Railroad Structures) we take occasion to call attention again to Mr. Duggan's valuable and expensive publication, exhibiting drawings, with full descriptions of the various stone, iron and wooden bridges, viaducts, tunnels, culverts, etc., of all the Railroads in the United States. Mr. Duggan is an accomplished Architect and Civil Engineer, who came from Ireland to this country to exercise his profession; but finding railroad construction here, in many respects, different from that he had been accustomed to in Europe, he applied himself to the study of our system; and the fruits of his researches and investigations embodied in this work, are well calculated to meet the exigencies of engineers, and to assist draughtsmen, bridge builders, mechanics and students.—[N. Y. Jour. of Com., Feb. 14, 1850.]

Published by
GEORGE DUGGAN,
300 Broadway, New York.

To whom all communications should be addressed, and subscriptions forwarded.

Emerson's Patent Ventilator,

ADAPTED to Cars, Engine houses, Public Halls, Factories, Churches, School Houses, Dwellings, Chimney Flues, etc.



This Ventilator is stationary, and cannot get out of order. It is constructed in such conformity to certain ascertained laws of pneumatics, as to insure a constant draft outward, whatever may be the changing direction of the wind. The Massachusetts Mechanic Association have awarded a gold medal to the Inventor, and the Manufacturers have already disposed of over

3,000 of the article. Manufactured and sold by
CHILSON, ALLEN, WALKER & Co.,
351 Broadway, New York.

NOTICE

For Proposals for Railroad Iron, for the Alabama and Tennessee River Railroad,

TO BE MANUFACTURED FROM ALABAMA ORE.

THE Alabama and Tennessee River Railroad Co. invite proposals, until the 1st of January, 1851, for Iron Rails, to be made of Alabama Iron, for the Northern Division and part of the Southern Division of their road, embracing a distance of about 105 miles. The rails are to be of the H pattern, in lengths of 18 feet, and weighing 63 lbs. per lineal yard. They are to be delivered on the Coosa river, at a landing to be hereafter designated, between Kimulgee ferry and Fort Williams, commencing their delivery on the 1st of November, 1851, and continuing it at the rate of from 80 to 100 tons per week, until the whole quantity required (10,500 tons) shall have been delivered. They are to be inspected by Lewis Troost, Chief Engineer.

It is proper to state to iron masters and capitalists at a distance, that the country traversed by the Northern and part of the Southern divisions of the road abounds in excellent iron ore and bituminous coal, and possesses every advantage for the successful manufacture of iron, health, cheap labor and provisions.

Further information may be obtained by addressing the President of the Company at Selma, Ala. By order of the Board of Directors.

J. W. LAPSLEY, President.

OFFICE FULLER'S PATENT INDIA-RUBBER SPRINGS,

New York, Sept. 25, 1850.

IN the Railroad Journal of last week, Mr. Ray, by advertisement, made statements totally untrue; for the purpose of misleading the parties interested in the use of India-rubber Springs. With respect to the patent granted a few days since by the present Commissioner of Patents to F. M. Ray, the facts of the case are as follows:

In 1845, Mr. W. C. Fuller obtained a patent in England for the application of Vulcanized India-rubber to springs of railroad cars; and in 1846, applied and obtained a patent for the same invention in the United States. Subsequent to this, Mr. Fowler M. Ray, and his associates, obtained a patent for a spring composed of cylinders of rubber made air tight, which proved to be of no value. He then commenced infringing upon Mr. Fuller's patent, but receiving notice to desist, he applied, in 1848, to Mr. Burke, the then Commissioner of Patents, for a patent similar to that granted to Fuller, which application was promptly refused. An interference was then declared by Ray and his associates, which after consideration by Mr. Burke, was dismissed. No appeal was made by Ray, and thus ended the matter.

Mr. Ewbank succeeded Mr. Burke, and M. Keller, a very warm and influential friend of Mr. Ewbank, was employed by Mr. Ray to procure a patent. Mr. Ewbank, setting aside the decision of Mr. Burke, and against the evidence produced by Mr. Fuller, on the hearing of the case before the U. S. Commissioner, has thought fit to grant Ray a patent. Proceedings have already been commenced, and the legality of this patent will be forthwith tested in a Court of Equity, where no undue influence can reach. In the meantime Fuller's patent stands valid and untouched, and all Mr. Ray's notices and advertisements about infringements by Fuller, upon his rights, and all implied threats of prosecution against those using Fuller's springs are intended to deceive the public and defraud Fuller. This gross attempt to deprive Mr. Fuller of his lawful rights as original inventor and patentee of India-rubber springs for railroad cars, etc., will be fully exposed in a court of law, till when, the directors of the various railroads in the United States, and others concerned, are cautioned against being misled or intimidated by any of Ray's misrepresentations.

With regard to the material of which the springs are composed, the rubber used by Mr. Fuller is made by Mr. Day, or by the Boston Belting Co., either under their own patents or that granted to Goodyear; the fact of Mr. Day having manufactured Vulcanized India-rubber two years before Goodyear applied for a patent, having given him a concurrent right to use it.

The statement that Mr. Day made opposition or was engaged to oppose Ray is not true. Mr. Day was never present at the taking of testimony except on the occasion of giving his own. The whole controversy was between the original inventor Fuller, whose agent the subscriber is, and the parties who are seeking to defraud him of his most valuable discovery.

Below is the opinions of counsel upon these questions.

NEW YORK, Sept. 23, 1850.

Sir: Yours of this date in relation to W. C. Fuller's and F. M. Ray's patents for India-rubber springs, is received. I state in reply that I have been one of the counsel for Mr. Fuller in the controversy, and understand the points involved in it. Mr. Fuller's patent was granted in England on the 23d October, 1845, and in the United States on the 24th October, 1846.

His American patent (the one in question) has not been annulled, repealed, or declared void or invalid, but it remains in full force and validity. He can maintain suits for violation of it. Purchasers using it cannot be made responsible to Mr. Ray under his patent: first, because they act under the authority of the United States, in their patent to Fuller, and second, because Ray's patent was issued contrary to the express provisions of the statute, and on that account is utterly void. No suit can be sustained upon it by Ray against any one.

The Commissioner of Patents, in his order for its issue, indicated his doubts on the subject of the right to issue it (his predecessor, Mr. Burke, having expressly refused Ray a patent) and says he gives Ray the benefit of his doubts, and consequently made the order. The error in granting this patent to Ray, under the facts and law of the case, is so palpable that I have been retained by Mr. Fuller to institute a suit in the U. S. Circuit Court to set it aside, and I am now preparing a Bill to be filed at once.

Your obedient servant, R. H. GILLET.
G. M. KNEVITT, Esq., Agent for W. C. Fuller.
I fully concur in the opinions above expressed.

F. B. CUTTING,
Counsel for Fuller, Wall st., Sept. 25, 1850.

G. M. KNEVITT,
Agent and Attorney for W. C. FULLER.

GRAHAM'S COMPOSITION, to Remove and Prevent Incrustation (or Scale) in STEAM BOILERS.

THIS valuable composition having been fully and extensively tested, is now offered to the public, as a sure remedy and preventive for incrustations in steam boilers of all descriptions. By its use, all scale is entirely removed from the boilers of Ocean and River Steamers, Locomotive and Stationary Engines, in from 3 to 20 running days, according to the size of the boiler and thickness of the scale. In New Boilers, all incrustation is prevented at a trifling expense.

The preservation of the boiler, great economy of fuel and labor, safety, and increased speed, are among the advantages to be derived from the use of this composition.

Orders should state the quality of water used, viz: "Salt," "Fresh," or "Brackish."

For sale, with directions for use, by

W. H. NEWMAN,
75 Pearl street,
New York.

TESTIMONIALS.

New York, August 17, 1850.

We have used Graham's Composition in the boilers of the Steamship Southerner, during several voyages between this place and Charleston. The boilers were old and very foul with scale, a very large quantity of which was removed by the use of the composition, and no new scale was formed.

From our own experience and observation in the use of the article, we are fully satisfied that it will effectually remove the incrustation made by sea water, and also that it will effectually prevent its formation.

We are also satisfied that the use of it will be attended with a great saving of fuel, and that it has no injurious effect upon iron.

DAVID N. MAXON, Engineer,
BERRY, Master,
Steamship Southerner.

Steamship Philadelphia, }

New York, August 27, 1850.

I have used "Graham's Composition for Steam Boilers," in the boilers of Steamship Philadelphia, on the voyage to and from Chagres, and am entirely satisfied that it will remove, dissolve and prevent all scale or incrustation in salt water boilers.

For the preservation of the boiler and economy of fuel and labor, I hereby recommend the employment of this composition in the Boilers of Ocean Steamers.

WM. BISBY,
Chief Engineer.

Novelty Iron Works, }

New York, July 5, 1850.

We have examined the specimen of Graham's Composition for preventing incrustation of steam boilers, and we believe it may be used with perfect safety in reasonable quantities for the purpose intended, as there does not appear to be any agent in the composition calculated to injure the iron.

STILLMAN, ALLEN & CO.

Piermont, May 20, 1850.

I have used "Graham's Composition," and find it to produce the intended effect; and I hereby, without hesitation, recommend it for Stationary, Marine and Locomotive Engine Boilers.

JOHN BRANDT,
Superintendent Motive Power,
New York & Erie R.R.

New York, July 25, 1850.

In answer to many inquiries as to the practical effect of "Graham's Composition," I will state that I have used it in the boiler of the Steamboat Sunwick, which had become considerably incrustated with hard scale from both salt and fresh water. We used 10 lbs. per day, for three days, without blowing off the water, until the fifth day, when all was drawn off. To our astonishment, we found the whole interior of the boiler as clear of scale and smooth as when it came from the hands of the maker. The following week, we tried the same quantity in a small steam tow boat.—The boiler had old scale of long accumulation and very thick. We ran the boat three days without blowing off, and on the fourth day washed out the boiler and found it, like the "Sunwick's," perfectly clean and smooth as when new. I am therefore enabled to state that the use of the composition in these two instances under my own immediate observation and direction, has been attended with complete success.

JAMES MORROW,
Engineer Astoria Ferry.

Fagotted Car and Engine Axles

FORGED by RANSTEAD, DEARBORN & Co., Boston, Mass.
These Axles enjoy the highest reputation for excellence, and are all warranted.

Ogden & Martin's ROSENDALE CEMENT.

WE are prepared to enter into arrangements for supplying our Cement for public works or other purposes. We warrant the cement equal in every respect to any manufactured in this country. It attains a great degree of hardness, sets immediately under water, and is a superior article for masonry coming in contact with water, or requiring great strength.

For sale in tight barrels, well papered, at their office by
OGDEN & MARTIN, 104 Wall st.
February 16, 1850.

The above cement is used in most of the fortifications building by government.

Railroad and Mathematical Instruments.

KUNS & BASELER, Mathematical Instrument makers, manufacture and keep for sale all kinds of mathematical instruments: also drawing instruments, scales and balances for the use of chemists, professional gentlemen, jewellers, etc., etc., of the most perfect description, at the lowest price, at 81 Nassau street, New York.

Ibbotson, Brothers & Co's CELEBRATED CAST STEEL

AND

Best Cast Steel Royal Improved Files, well known as better adapted for Engineers' and Machinists' purposes than any now in use in the United States.

Every description of Square, Octagon, Flat and Round Cast Steel, Sheet, Shovel and Railway Spring Steel, etc., and Steel to order for any purposes—manufactured at their works in Sheffield—and universally known by the old stamp "Globe."

HENRY I. IBBOTSON, Agent,
218 Pearl st., New York.

Railroad Iron.

OF ANY PATTERN AND WEIGHT,
Of a Favorite Brand,
And deliverable in Bond, or Duty paid, at any Port of the U. S., contracted for on favorable terms, by
CHARLES ILLIUS,
20 Beaver St., New York.

Pig and other Iron also contracted for. Sole Agent for "Baxter's Machine and Burning Oil"—particularly adapted for "Railroads" and other Machinery—Preferred to Sperm by the many now using it, and 25 per cent. cheaper.

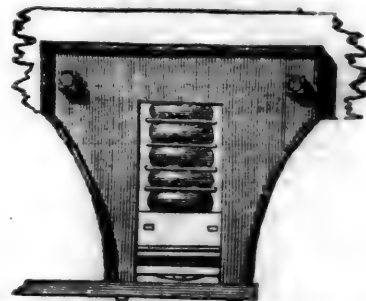
Coal.

CUMBERLAND SEMI-BITUMINOUS COAL
superior quality for Locomotives, for sale by
H. B. TEBBETTS,
No. 40 Wall St., New York.

May 12, 1849.

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FULLER'S PATENT INDIA RUBBER SPRING.



THESE SPRINGS ARE THE CHEAPEST, the lightest and most durable of any yet known. They are easily applied to new or old cars, and there is small possibility of any accident occurring to them. Other parties through Mr. Ray set up claims to an India Rubber Spring which, though the same in principle, is very inferior in its working and durability. Actions are in progress for an Infringement on Fuller's Patent against parties using that Spring.

The superiority of Fuller's Spring over that claimed by Mr. Ray is fully established and has frequently been testified to. The following are from gentlemen who have had much experience with both Springs.

"It will afford me pleasure to recommend your springs to the companies in this region, in preference to Ray's which I am confident are inferior in mechanical arrangement to yours."
JOHN M'RAE,
Engineer S. Carolina R. R., Charleston.

"I do not hesitate to allow you to say that I concur in Mr. M' Rae's opinion that Ray's springs are inferior in mechanical arrangement to Fuller's. I repeatedly expressed that opinion long before Mr. M' Rae had seen your springs (as I believe) and entertain it still."
WM. PARKER,
Gen'l Supt. of Baltimore and Ohio R. R.

Office of Sup't Norwich & Worcester R.R. Co. }
December 26, 1849. }

"I most fully concur in the opinion of Jas. M' Rae, Engineer of S. Carolina Railroad, that 'Ray's Springs are inferior to Fuller's Springs,' and shall with pleasure recommend them to all Railroad Companies for adoption. I have used both springs on this road and have no hesitation in saying that I should in all cases prefer Fuller's Spring."

SAM'L H. P. LEE, JR.,
Sup't and Engineer.

Office B. & P. R. R. Co. }
Boston, 20th December, 1849. }

"This company have cars fitted up with both Ray's and Fuller's 'Metallic India Rubber Springs,' and do not hesitate to say that Fuller's arrangement very much superior to Ray's."

W. RAYMOND LEE, Sept.

The following result has been obtained by experiment upon one railroad.

A set of Trucks fitted with Steel Springs—cost	\$190.77	and weigh	2355 lbs.
The same with Fuller's Springs,	131.71	"	1911 lbs.
Difference,	\$59.06	"	444 lbs.

Not only is there an advantage in the cost, but owing to the great reduction in weight, the car can be made lighter throughout, and so an enormous saving in weight may be effected in a Train.

AGENTS.

G. M. KNEVITT, 38 Broadway, N. Y.,
JOHN THORNLEY, 110 Chestnut St., Philad.
The BOSTON BELTING CO., Milk St., Boston.
January 2, 1850.

American Cast Steel.

THE ADIRONDAC STEEL MANUFACTURING CO. is now producing, from American iron, at their works at Jersey City, N.J., Cast Steel of extraordinary quality, and is prepared to supply orders for the same at prices below that of the imported article of like quality. Consumers will find it to their interest to give this a trial. Orders for all sizes of hammered cast steel, directed as above, will meet with prompt attention.

May 28, 1849.



To Merchants, Railroad Companies, Machinists and Boiler Makers.

THE subscribers beg leave to call attention to their very large stock of Iron and Steel—of American, English, Swede and Norway make—of all the different kinds in use. Also, Railroad Iron, Ship, Boat and Railroad Spike. They are also Agents for the *Best Pennsylvania Locomotive Boiler and Tank Iron*, each sheet of which will be stamped and warranted, at lowest mill prices. Our prices for all kinds of iron will be found very low, either for cash or approved credit.

BRINK & DURBIN, Philadelphia.

ENGINEERS.**Atkinson, T. C.,**

Alexandria and Orange Railroad, Alexandria, Va.

Baneks, C. W.,

Civil Engineer, Vicksburg, Miss.

Buckland, George,

Troy and Greenbush Railroad.

Clement, Wm. H.,

Little Miami Railroad, Cincinnati, Ohio.

Cozzens, W. H.,

Engineer and Surveyor, St. Louis, Mo.

Alfred W. Craven,

Chief Engineer Croton Aqueduct, New York.

Davidson, M. O.,

Eckhart Mines, Alleghany Co., Maryland.

Fisk, Charles B.,

Cumberland and Ohio Canal, Washington, D. C.

Felton, S. M.,

Fitchburgh Railroad, Boston, Mass.

Floyd-Jones, Charles,

South Oyster Bay, L. I.

Gzowski, Mr.,

St. Lawrence & Atlantic Railroad, Montreal, Canada.

Gilbert, Wm. B.,

Rutland and Burlington Railroad, Rutland, Vt.

Grant, James H.,

Nashville and Chattanooga R. R., Nashville, Tenn.

S. W. Hill,

Mining Engineer and Surveyor, Eagle River, Lake Superior.

Hewson, M. Butt,

Memphis, Tenn.

Holcomb, F. P.

Southwestern Railroad, Macon, Ga.

Johnson, Edwin F.

New York and Boston Railroad, Middletown Ct.

Latrobe, B. H.,

Baltimore and Ohio Railroad, Baltimore, Md.

Miller, J. F.,

Worcester and Nashua Railroad, Worcester, Mass.

Morris, Elwood,

Schuylkill Navigation, Schuylkill Haven, Pa.

Morton, A. C.,

Atlantic and St. Lawrence Railroad, Portland, Me.

McRae, John,

South Carolina Railroad, Charleston, S. C.

Nott, Samuel,

Lawrence and Manchester Railroad, Boston.

Prichard, M. B.,

East Tennessee and Georgia R. R., Cleveland, Tenn.

Roebfing, John A.,

Trenton, N. J.

W. Milnor Roberts,

Bellerfontaine and Indiana Railroad, Marion, Ohio.

Roberts, Solomon W.,

Ohio and Pennsylvania Railroad, Pittsburgh, Pa.

Sanford, C. O.,

South Side Railroad, Virginia.

Schlatter, Charles L.,

Northern Railroad (Ogdensburg), Malone, N. Y.

Sours, Peter,

Rahway, New Jersey.

Stark, George.,

Bost., Con. and Mont. R. R., Meredith Bridge, N. H.

Steele, J. Dutton,

Pottstown, Pa.

Trautwine, John C.,

Panama Railroad—Address through office of Panama Railroad Co., 78 Broadway, N. Y.

Trimble, Isaac R.,

Philad., Wil. & Baltimore Railroad, Wilmington, Del.

Tinkham, A. W.,

United States Fort, Bucksport, Me.

Thomson, J. Edgar.,

Pennsylvania (Central) Railroad, Philadelphia.

Troost, Lewis,

Alabama and Tennessee Railroad, Selma, Ala.

Whipple, S.,

Civil Engineer and Bridge Builder, Utica, N. Y.

Williams, E. P.,

Auburn and Schenectady Railroad, Auburn, N. Y.

Williams, Charles H.,

Milwaukee, Wisconsin.

HOTELS.**Exchange Hotel,**Adjoining Eastern Railroad Depot,
BUFFALO, N. Y.BY.....**FISK & SPERRY,**
Late of Delevan House, Albany.**J. D. Abraham, Architect,**NO. 300 MAIN STREET,
BUFFALO, N. Y.**Fountain Hotel,**LIGHT STREET, BALTIMORE,
P. THURSTON.....Proprietor.**DUNLAP'S HOTEL,**On the European Plan,
NO. 135 FULTON STREET,
Between Broadway and Nassau St.,
NEW YORK.**MANSION,**Corner of Maine and Exchange Streets,
P. DORSHIMER.....BUFFALO.**GUY'S****United States Hotel,**
(Opposite Pratt street Railroad Depot.)
BALTIMORE.

JOHN GUY. * WILLIAM GUY.

American Hotel,Pratt street, opposite the Railroad Depot,
BALTIMORE.HENRY M. SMITH.....Proprietor.
Late of the Exchange & St. Charles Hotels, Pittsburg.**Washington Hotel,**BY JOHN GILMAN,
\$1 Per Day.
No. 206 Pratt street, (near the Depot.)
BALTIMORE.**Barnum's City Hotel,**MONUMENT SQUARE, BALTIMORE.
This Extensive Establishment, erected expressly for a Hotel, with every regard to comfort and convenience, is situated in the centre and most fashionable part of the city, and but a few minutes' walk from the Railroad Depots and Steamboat Landings.
The House has lately undergone a thorough repair, embracing many valuable improvements, and will accommodate 250 Guests.
BARNUM & CO.**JONES' HOTEL,**NO. 152 CHESTNUT STREET,
PHILADELPHIA.

Balders & West, Proprietors.

BUSINESS CARDS.**Lithography.**

JOHN P. HALL & CO.,

161 Main st., Buffalo, (Commercial Advertiser Build.)

Are prepared to execute all kinds of Lithography in good style and at reasonable rates. Particular attention will be paid to Engraving Railroad Maps, Engineer's Plans and drafts, etc., and orders in this line are respectfully solicited.

J. T. Hodge

Will attend to the examination of mining tracts near Lake Superior, and prepare Reports and Maps.

Address, during the Summer,
[Ontanagon Postoffice, Lake Superior.**Cumberland Steam Coal,**

FROM THE

FROSTBURG MINES, MD.

H. A. TUCKER,

Agent of Frostburg Coal Co.
No. 50 Wall Street, New York.**Eaton, Gilbert & Co.,**Railroad Car, Coach and Omnibus Builders,
TROY, N. Y.**Charles T. Jackson, M. D.,**

STATE ASSAYER, late Geologist to Maine, Rhode Island, New Hampshire, and the United States, offers his services to his friends and the public in making any Chemical, Mineralogical or Geological researches that may be required for the improvement of Agriculture and the Manufacturing Arts. Particular attention will be paid to the exploration of mines and to assaying of ores of the metals.

State Assayer's office, 31 Somerset st.

Boston Sept. 3, 1850.

To Railroad Companies and Mechanical Establishments.

A Person of considerable experience and practical knowledge in Mechanical, Civil and Marine Engineering, is anxious to meet with an engagement with either a Private Individual or Public Company, who may have works either to design or execute in the above branches of the Engineering Profession.

Address Z. Y., 47 Atlantic st., South Brooklyn, L.I.

STEEL AND FILES.**R. S. Stenton,**

20 CLIFF STREET, NEW YORK,

AGENT FOR

J. & Riley Carr'sBAILEY-LANE WORKS, SHEFFIELD,
Manufacturers of Cast, Shear, German and Blister**STEEL**

Of all descriptions. Warranted Good

FILES.

Manufacturers of Machinists' Warranted Best Cast Steel Files, expressly for working upon Iron and Steel, made very heavy for recutting.

A full Stock of Steel and Files at all times on hand. 6m4

Walter R. Johnson,

CIVIL AND MINING ENGINEER AND ATTORNEY for Patents. Office and Laboratory, F St., opposite the Patent office, Washington, D. C.

Dudley B. Fuller & Co.,
IRON COMMISSION MERCHANTS,
No. 139 GREENWICH STREET,
NEW YORK.**Manning & Lee,**GENERAL COMMISSION MERCHANTS,
NO. 51 EXCHANGE PLACE,
BALTIMORE.

Agents for Avalon Railroad Iron and Nail Works. Maryland Mining Company's Cumberland Coal 'CED'—'Potomac' and other good brands of Pig Iron.

Cop Waste.

CLEAN COP WASTE, suitable for cleaning Railroad, Steamboat and Stationary Engines, constantly on hand and for sale by

KENNEDY & GELSTON,

54 Pine St., New York.

October 27, 1849,

3m

PLUSHES

FOR

Railway Cars & Omnibuses.**F. S. & S. A. MARTINE,**

112 WILLIAM ST., NEAR JOHN.

ARE now receiving a large and complete assortment of Plain and Figured PLUSHES, of their own importation, which will be sold at the lowest market price, viz: Crimson, Maroon, Scarlet, Green, Blue, Purple, etc.

ALSO—CURLED HAIR, the best manufactured in market.

Samuel Kimber & Co.,**COMMISSION MERCHANTS**

WILLOW ST. WHARVES, PHILADELPHIA.

AGENTS for the sale of Charcoal and Anthracite Pig Iron, Hammered Railroad Car and Locomotive Axles, Force Pumps of the most approved construction for Railroad Water Stations and Hydraulic Rams, etc., etc.

July, 27, 1849.

James Herron, Civil Engineer,

OF THE UNITED STATES NAVY YARD,

PENSACOLA, FLORIDA.,

PATENTEE OF THE

HERRON RAILWAY TRACK.

Models of this Track, on the most improved plans, may be seen at the Engineer's office of the New York and Erie Railroad.

To Railroad Companies.**—WROUGHT IRON WHEELS—**

SAFETY AND ECONOMY.

NORRIS' LOCOMOTIVE WORKS,

SCHENECTADY, NEW YORK,

Are Manufacturing Wrought Iron Driving, Truck, Tender, and Car Wheels—made from the best American Iron. Address E. S. NORRIS.

May 16, 1849.

Manufacture of Patent Wire ROPE AND CABLES,

For Inclined Planes, Suspension Bridges, Standing Rigging, Mines, Cranes, Derrick, Tilters, &c., by

JOHN A. ROEBLING, Civil Engineer,

TRENTON, N. J.

Doremus & Harris,

ANALYTICAL & CONSULTING CHEMISTS,

179 BROADWAY, NEW YORK.

SCHOOL OF CHEMISTRY.

To Engineers and Surveyors.

E. BROWN AND SON Mathematical inst. makers No. 27 Fulton Slip, New York, make and keep for sale, Theodolites, Levelling inst., Levelling rods, Surveyors Compasses, and Chains, Cases of Mathematical drawing insts. various qualities, together with a general assortment of Ivory Scales and small insts. generally used by Engineers.

Ranstead, Dearborn & Co.,

MANUFACTURERS OF

LOCOMOTIVE CRANKS AND CAR AXLES,

ALSO

WROUGHT IRON SHAFTING,
And All Kinds of Hammered Shapes.

Forge at Commercial Point, Dorchester,

Office 25 Foster's Wharf, opposite No. 211 Broad St.

BOSTON.**Henry I. Ibbotson,**

IMPORTER of Sheffield and Birmingham Goods.

Also, Agent for the Manufacture of Telegraph Wire.

218 PEARL ST., NEW YORK.

Cumberland, (Md.,) Coals for Steaming, etc.

ORDERS RECEIVED FOR AND FILLED
by J. COWLES, 27 Wall St., N. Y.

Samuel D. Willmott,

MERCHANT, AND MANUFACTURER OF

CAST STEEL WARRANTED SAWS,

—AND FILES—

IMPORTER OF THE

GENUINE WICKESLY GRINDSTONES

NO. 8 LIBERTY STREET,

NEW-YORK.

Railroad Instruments.

THEODOLITES, TRANSIT COMPASSES, and Levels, with Fraunhoffer's Munich Glasses, Surveyor's Compasses, Chains, Drawing Instruments, Barometers, etc., all of the best quality and workmanship, for sale at unusually low prices, by

E. & G. W. BLUNT,

No. 179 Water St., cor. Burling Slip.
New York, May 19, 1849.

IRON.**Car Wheel Iron.**

100 Tons "Columbia" No. 2 Cold Blast Charcoal Iron.

300 Tons "Salisbury" No. 1, do. do.

For sale by CHARLES T. GILBERT,

No. 80 Broad st.

New York, Sept. 21, 1850.

Railroad Spikes.

THE subscribers are prepared to make and execute contracts for Railroad Spikes of a superior quality, manufactured by the New Jersey Iron Company, at Boonton.

DUDLEY B. FULLER & CO.

139 Greenwich st. corner of Cedar.

Railroad Iron.

FOR SALE—600 Tons of superior flat bar Railroad Iron, two and a half by three-fourths—which has been in use on the Cumberland Valley Railroad for about three years. For terms apply to Henry J. Bidle, Esq., Philadelphia, or to FREDK. WATTS, President of the Cum. Val. R.R., Carlisle, Pa. Carlisle, Sept. 17, 1850.

Railroad Iron.

1650 Tons, weighing about 61 lbs. per yard, 40 tons, weighing about 52 lbs. per yard, and 825 tons, weighing about 53½ lbs. per yard, of the latest and most approved patterns of T rail, for sale by BOORMAN, JOHNSTON & CO., 119 Greenwich street.

New York, Aug. 26, 1850.

N.B.—B. J. & Co. are also prepared to take contracts for English rails, delivered in any of the Atlantic ports of the United States.

Railroad Iron.

THE Undersigned, Agents for Manufacturers, are prepared to contract to deliver Rails of superior quality, and of any size or pattern, to any ports of discharge in the United States.

COLLINS, VOSE & CO.,

74 South St.

New York, June 1, 1850.

Railroad Iron.

1,500 Tons weighing 53 lbs. per lineal yard.

500 " " 57 " "

500 " " 56 " "

500 " " 60 & 61 lbs. "

Also 24x½ flat rails. All the above being of approved patterns. For sale by

DAVIS, BROOKS, & CO.,

68 Broad street.

N.B.—Rails imported on commission, or at a fixed price.

Iron.

Pig Iron, Anthracite and Charcoal; Boiler and Flue Iron, Spring and Blistered Steel, Nail Rods, Best Refined Bar Iron, Railroad Iron, Car Axles, Nails, Stove Castings, Cast Iron Pipes of all sizes, Railway Chairs of approved patterns for sale by

COLEMAN, KELTON & CAMELL,

109 N. Water St., Philadelphia.

Railroad Iron.

THE UNDERSIGNED, HAVING made arrangements abroad, are prepared to contract for the delivery of Foreign rails, of approved brands upon the most favorable terms.

They will also make contracts for American rails, made at their Trenton works, from Andover Iron, in whole or in part, as may be agreed upon.

They are prepared to furnish Telegraph, Spring and Market Wire; Braziers and Wire Rods; Rivets and Merchant Bars to order, all made exclusively from Andover Iron. The attention of parties who require iron of the very best quality for special purposes, is respectfully invited.

COOPER & HEWITT,

17 Burling Slip, New York.

February 15, 1850.

Glendon Refined Iron.

Round Iron, Band Iron, Hoop Iron,
Square " Flat " Scroll "

Axles, Locomotive Tyres,

Manufactured at the Glendon Mills, East Boston, for sale by

GEORGE GARDNER & CO.,

5 Liberty Square, Boston, Mass.

Sept. 15, 1849.

3m37

PATENT HAMMERED RAILROAD, SHIP & BOAT SPIKES.—The Albany Iron Works have always on hand, of their own manufacture, a large assortment of Railroad, Ship and Boat Spikes from 2 to 12 inches in length, and of any form of head. From the excellence of the material always used in their manufacture, and their very general use for railroads and other purposes in this country, the manufacturers have no hesitation in warranting them fully equal to the best spikes in market, both as to quality and appearance. All orders addressed to the subscribers at the works will be promptly executed.

JOHN F. WINSLOW, Agent.

Albany Iron and Nail Works, Troy, N. Y.
The above Spikes may be had at factory prices, of Erastus Corning & Co. Albany; Meritt & Co., New York; E. Pratt & Brother, Eastmore, Md.

LAP—WELDED WROUGHT IRON TUBES

FOR

TUBULAR BOILERS,

FROM ONE AND A QUARTER TO SEVEN INCHES IN DIAMETER.

THE ONLY Tubes of the same quality and manufacture as those so extensively used in England, Scotland, France and Germany, for Locomotive, Marine and other Steam Engine Boilers.

THOMAS PROSSER & SON, Patentees,

28 Platt street, New York.

Railroad Iron.

THE UNDERSIGNED ARE PREPARED TO contract for the delivery of English Railroad Iron of favorite brands, during the Spring. They also receive orders for the importation of Pig, Bar, Sheet, etc. Iron.

THOMAS B. SANDS & CO.,

73 New street,

February 3, 1849.

New York.

Iron Store.

THE Subscribers, having the selling agency of the following named Rolling Mills, viz: Norristown, Rough and Ready, Kensington, Triadelphia, Pottsgrove and Thorndale, can supply Railroad Companies, Merchants and others, at the wholesale mill prices for bars of all sizes, sheets cut to order as large as 58 in. diameter; Railroad Iron, domestic and foreign; Locomotive tire welded to given size; Chairs and Spikes; Iron for shafting, locomotive and general machinery purposes; Cast, Shear, Blister and Spring Steel; Boiler rivets; Copper; Pig iron, etc., etc.

MORRIS, JONES & CO.,

Iron Merchants,

Schuylkill 7th and Market Sts., Philadelphia.

August 16, 1849.

ly33

Railroad Iron.

THE MOUNT SAVAGE IRON WORKS, Alleghany county, Maryland, having recently passed into the hands of new proprietors, are now prepared, with increased facilities, to execute orders for any of the various patterns of Railroad Iron. Communications addressed to either of the subscribers will have prompt attention.

J. F. WINSLOW, President

Troy, N. Y.

ERASTUS CORNING, Albany

WARREN DELANO, Jr., N. Y.

JOHN M. FORBES, Boston.

ENOCH PRATT, Baltimore, Md.

November 6, 1848.

Railroad Iron.

THE SUBSCRIBERS ARE PREPARED TO take orders for Railroad Iron to be made at their Phoenix Iron Works, situated on the Schuylkill River, near this city, and at their Safe Harbor Iron Works, situated in Lancaster County, on the Susquehanna river; which two establishments are now turning out upwards of 1800 tons of finished rails per month.

Companies desirous of contracting will be promptly supplied with rails of any required pattern, and of the very best quality.

REEVES, BUCK & CO.

45 North Water St. Philadelphia,

March 15, 1849.

Tredegar Iron Works.

ROLLING MILL FOUNDRY AND MACHINE SHOPS. The undersigned continues to manufacture at his Works in this city (from best charcoal metal) Bar Iron of every description, embracing Rounds and Squares, from 1½ to 5 inches diameter. Flats, from ½ to 7 inches, all thicknesses. Bands and Scrolls, all sizes. Boilerplate and Plough Iron. Railroad and Locomotive Axles and Tires. Locomotive Frames, Spikes and Plates. Hoops, Ovals, Half Ovals, Half Rounds, Angle, T, L, and indeed every description of Iron usually manufactured, all of which he warrants to be equal to any made in this country. He also manufactures at his Foundry and Machine Shops all descriptions of Railroad Work, say, Locomotives, Railroad Wheels and Axles complete and ready for the road, Railroad Chairs, etc. Also, Marine and Stationary Engines all sizes, Sugar mills and Engines, Horse mills, and every kind of Machinery usually required for the operations of the country. He has paid particular attention to getting up machinery, etc., for Gold Mine operations, and those in want of such work might find it to their advantage to give him a call.

J. R. ANDERSON.
Richmond, Va., Sept. 10, 1850.

CUT NAILS OF BEST QUALITY, BAR IRON (including Flat Rails) manufactured and for sale by
FISHER, MORGAN & CO.,
75 N. Water St., Philadelphia.

Iron Wire.

REFINED IRON WIRE OF ALL KINDS, Card, Reed, Cotton-flyer, Annealed, Broom, Buckle, and Spring Wire. Also all kinds of Round, Flat or Oval Wire, best adapted to various machine purposes, annealed and tempered, straightened and cut any length, manufactured and sold by
ICHABOD WASHBURN.
Worcester, Mass., May 25, 1849.

Wheel, Forge and Foundry Iron.

LOCUST GROVE Wheel Iron of great strength and superior chilling property.
Balt. Charcoal Forge Iron, from Patuxent, Curtis Creek and Gunpowder furnaces.
Elkridge Foundry Iron, of superior strength and softness. Anthracite and Charcoal Iron from Pennsylvania and Virginia. Gas and Water Pipes, Lamp Posts from Elkridge furnace.

LEMMON & GLENN,
6m9 62 Buchanan's Wharf, Baltimore.

**S. S. Keyser & Co.,
IRON WAREHOUSE,**
Corner of South and Pratt Streets,
BALTIMORE, MD.

Selling Agents for the Rough and Ready Bar Iron and Elk Boiler and Plug Iron Rolling Mills, Sarah and Taylor Furnaces, and Wrightsville Hollow Ware Foundry, and Dealers in Bar and Sheet Iron, and Cast, Sheer, German, Blister, Spring and Electroplated Steel, etc., etc.

Smith & Tyson,

GENERAL COMMISSION MERCHANTS,
No. 25 South Charles St., Baltimore, Md.

AGENTS for the Celebrated Columbia Pig Iron, suitable for Car Wheels and Chilled Rails.
Columbia refined Charcoal Blooms; Refined Charcoal Juniata Billet Iron for Wire; Refined Iron for Bridging, of great strength; Cut Nails, Spikes, and Brads; Railroad Spikes and Wrought Chairs. 22tf

**Stickney & Beatty,
DEALERS IN IRON AND IRON
MANUFACTURERS.**

AGENTS for the Balt. City Rolling Mill, from which establishment they are prepared to furnish Ellicott's round, square, and flat bar iron, puddled and charcoal boiler plates and billet iron—also agents for the sale of the Laurel and Maryland (Balt.) charcoal forge pig irons, Balt. hard iron for chilling wheels, anti-Eatam nails, Catocin foundry iron, boiler blooms from the Caledonian works, Wm. Jessop & Son's cast steel, Coleman's blister steel and nail rods, hoop, band, sheet, oval and common English iron.

No. 18 and 20 South Charles st., Baltimore.

Railroad Iron.

CONTRACTS made by the subscribers, agents for the manufacturers, for the delivery of Railway Iron, at any port in the United States, at fixed prices, and of quality tried and approved for many years, on the oldest railways in this country.

RAYMOND & FULLERTON, 45 Cliff st.

IRONDALE PIG METAL, MANUFACTURED and for sale by the Bloomsburg Railroad Iron Co.
LINDLEY FISHER, Treasurer.
75 N. Water St., Philadelphia.

Railroad Iron.

2000 Tons, weighing 58 pounds per lineal yard, of the most approved pattern of T rails, in store and to arrive, for sale by
COLLINS, VOSE & CO.,
74 South St.
New York, June 1, 1850.

Railroad Iron.

3,000 TONS C. L. MAKE 63½ lbs. per yard, now landing and to arrive.
Also contracts made for future delivery of above superior make English Iron.
300 Tons Banks Best Iron, Round, Square and Flat.
200 " English Bar " " " " "
10 " 9-16 Square Iron for Railroad Spikes.
For sale in lots to suit purchasers by
DAVID W. WETMORE.
New York, March 26, 1850. 3m

**WILLIAM JESSOP & SONS'
CELEBRATED CAST-STEEL.**

The subscribers have on hand, and are constantly receiving from their manufactory,
PARK WORKS, SHEFFIELD,
Double Refined Cast Steel—square, flat and octagon.
Best warranted Cast Steel—square, flat and octagon.
Best double and single Shear Steel—warranted.
Machinery Steel—round.
Best and 2d gy. Sheet Steel—for saws and other purposes.
German Steel—flat and square, "W. I. & S." "Eagle" and "Goat" stamps.
Genuine "Sykes," L. Blister Steel.
Best English Blister Steel, etc., etc.
All of which are offered for sale on the most favorable terms by
WM. JESSOP & SONS,
91 John street, New York.
Also by their Agents—
Curtis & Hand, 47 Commerce street, Philadelphia.
Alex'r Fullerton & Co., 119 Milk street, Boston.
Stickney & Beatty, South Charles street, Baltimore.
May 6, 1849.

**JOHNSON, CAMMELL & Co's
Celebrated Cast Steel,**

**AND
ENGINEERING AND MACHINE FILES,**
which for quality and adaptation to mechanical uses, have been proved superior to any in the United States. Every description of square, octagon, flat and round cast steel, sheet, shovel and railway spring steel, best double and single shear steel, German steel, flat and square, goat stamps, etc. Saw and file steel, and steel to order for any purposes, manufactured at their Cyclops Steel Works Sheffield.
JOHNSON, CAMMELL & CO.,
100 William St., New York.
November 23 1849.

Railroad Iron.

THE Undersigned, Agents for Manufacturers, are prepared to contract for the delivery of English, Welsh and Scotch Rails, of any pattern and weight, also for every description of English, Welsh, Scotch, and Swedish Iron, Railway Chairs and Spikes, Rivets, Bolts, Nuts, Washers, Chain Cables, Anchors, Tin Plates, German Spelter, Iron Castings, and every description of Machinery.

WILLIAM BIRD & CO.,
Iron and Tin Plate Merchants,
44 Wall st., New York.

And at 5 Martin's Lane, City, London,
and 140 Buchanan st., Glasgow.

July 27th, 1850.

**To the Proprietors of Rolling
Mills and Iron Works.**

THE Undersigned—Proprietors of Townsend's Furnace and Machine Shop, Albany—are extensively engaged in the manufacture of Machinery and fixtures for Iron, and Copper Rolling Mills, and Iron Works. Having paid particular attention to the manufacture of *Rolls* (Rollers), both *chilled* and *dry-sand*, they feel confident that they can execute orders for such castings in a satisfactory manner. And to give assurance of this, they beg leave to refer to the following named persons, proprietors and managers of some of the most extensive rolling mills in the country, viz: Jno. F. Winslow, J. Tuckerman, H. Burden, W. Burr, J. & J. Rogers, Salts & Co., J. B. Bailey, L. G. B. Cannon, Hawkins & Atwater, etc., etc.

F. & T. TOWNSEND.

Albany, August 18, 1849.

Railroad Iron.

B. O. Railway Tires, Railway Wheels,
Scotch Pig Iron, Tin Plates and Banca Tin,
Muntz's Patent Metal Sheathing,
Baltimore Copper.

Contracts for Rails made on behalf of the manufacturers, for delivery at any ports in the United States, at fixed prices.

Bowling Tires and Tire Bars and Scotch Pigs imported to order.

Muntz's Ship-sheathing, and a general stock of Tin Plates and Banca Tin in store, and for sale by
RAYMOND & FULLERTON, 45 Cliff st.

Bowling Iron. Stamped B.O.

Railway Tire Bars Rivet Iron
Locomotive and other Axles Locomotive Frame do
Boiler Plates Bars,
and every other description of this superior Iron.

The subscribers, agents for the sale of Bowling Iron, are prepared to execute orders for importation, especially for railway and machinery uses, with despatch from the manufacturers.

RAYMOND & FULLERTON, 45 Cliff st.

**Lovegrove's Patent Cast Iron
Water and Gas Pipes.**

THE Subscriber, the Inventor and Patentee of the Centrifugal mode of giving form to metallic substances while in a molten state, is preparing to make Cast Iron Water and Gas Pipes, of any dimensions, at prices much lower than they can be made in the old manner, and the pipes warranted to stand a pressure of three hundred pounds to the square inch, and to be soft enough to drill. Steam Engines and all kinds of machinery. Cast Iron Doors and Frames, and Mill Castings of every description, made to order.

THOMAS LOVEGROVE,
Machinist and Founder,
West Falls Avenue, below Pratt st., Baltimore.

**Ray's Patent India Rubber
Car Springs.**

Savannah, Ga., May 22, 1850.

FOWLER M. RAY, Esq.,
Dear Sir: I have no hesitation in saying, after having used on our road your springs and Fuller's, that I consider yours decidedly the best in every particular, and in this opinion I am sustained by all our officers. Fuller's spring has a tendency to split, and also to chafe or abrade by the constant friction on the cast iron plates or discs: and in my opinion is not near so elastic as yours.

Your springs, which have been in use on our road for 12 or 15 months past, and in constant use under both passenger and freight cars, are to all appearances as elastic, sound and good, as when first put in use.

We are now building eighty-five new cars, of which for fifty-sets the springs have been ordered of you.

GEORGE A. ADAMS,
Master Carpenter,
Central Railroad and Banking Co. of Georgia.

Connecticut River Railroad Office, }
Northampton, May 4, 1850. }

E. CRANE, Esq.,

Dear Sir: It is now about two years since I first tried the experiment of using a set of Ray's India-rubber Springs upon one of our merchandise cars, and although the car has been in constant service since that time, I do not on examination find the slightest difference either in the thickness or elasticity of the material.

The same result has followed wherever we have applied them, either for wheel or draw springs on Engines, Tenders or Cars. At present we use no other; either in replacing old springs or building new cars—and I am perfectly satisfied that for economy, durability, safety, and ease of motion, that Ray's India-rubber is the best article for Springs which has been presented to the public.

Yours respectfully, J. HUNT,
Supt. Connecticut River Railroad.

EDWARD CRANE, Esq.,

Dear Sir: Having applied to cars of the Boston and Worcester Railroad Corporation, Ray's Vulcanised Rubber Springs (where they have been in use for some two years last past), I have had occasion to observe their operation, and am free to say in answer to your inquiries, that they retain their elasticity perfectly during all changes of atmospheric temperature; and are in my opinion a most valuable acquisition to Railroad Cars—are not liable to derangement, as is the case with steel springs; while at the same time it costs less to apply them. Respectfully yours,

D. N. PICKERING,
Supt. Motive Power, Bos. & Wor. Railroad.
Boston, April 15th, 1850.

Monument Foundry.

A. & W. DENMEAD & SON,
Corner of North and Monument Sts.,—Baltimore,

HAVING THEIR

IRON FOUNDRY AND MACHINE SHOP

In complete operation, are prepared to execute faithfully and promptly, orders for Locomotive or Stationary Steam Engines, Woolen, Cotton, Flour, Rice, Sugar Grist, or Saw Mills, Slide Hand or Chuck Lathes, Machinery for cutting all kinds of Gearing, Hydraulic, Tobacco and other Presses, Car and Locomotive patent Ring Wheels, warranted, Bridge and Mill Castings of every description, Gas and Water Pipes of all sizes, warranted, Railroad Wheels with best faggoted axle, furnished and fitted up for use, complete. Being provided with Heavy Lathes for Boring and Turning Screws, Cylinders, etc., we can furnish them of any pitch, length or pattern. Old Machinery Renewed or Repaired—and Estimates for Work in any part of the United States furnished at short notice.

June 8, 1849.

RAILROAD CAR AND COACH TRIMMINGS.

Doremus & Nixon,
IMPORTERS AND FURNISHERS

HAVE FOR SALE

Plain Garnet Plush. Fig. Garnet Plush (Butterfly pat.
"Crimson" "Crimson" (Elegant.
"Scarlet" " " (Gen. Taylor.

BROCADELLES.

Crimson Silk Brocadelles. Gold and Maroon do.
Gold and Blue " " Brown "
Silk and Wool " of every color.

MOQUETTES,

Of elegant designs and colors.

GERMAN CLOTH FOR CAR LININGS.

The most beautiful goods ever shown in this country, and the subscribers are the sole agents for the sale of them.

Oil cloths Enamelled with Gold. } These goods can be
" " Silver. } furnished in any
Do. Silver ground velvet printed. } dimensions req'd.

CURLED HAIR

Of every description and quality.

JNO. W. A. STRICKLAND, Agent.
New York, 1850. 1yl6

FOWLER M. RAY'S Patent India-rubber Railroad CAR SPRING.

New York and Erie Railroad Shops,
Piermont, March 26, 1850.

This will certify that from practical experience in the use of Fowler M. Ray's India rubber Car Springs, I believe them to be far superior to any others now in use.

I have never known them to be affected by any change of temperature, as other Rubber Springs have been affected on this road.

I am at the present time repairing a Passenger Car that Mr. Ray and myself mounted with his springs about two years and eight months since.

The springs are at the present time as perfect, to all appearances, as when first applied to the car.

Respectfully yours,

HORACE B. GARDNER,
Foreman of the Car Shops.

Supt. Office N.Y. & H. R.R., }
New York, March 8, 1850. }

This is to certify that we have used the Rubber Springs manufactured by Mr. F. M. Ray for the past twenty months, "both for Passenger and Freight Car Springs and Bumpers, and of different sizes," and have in every case given entire satisfaction, and I consider them the best spring now in use.

M. SLOAT, Supt.

Boston, March 5, 1850.

In answer to your enquiry about India-rubber Springs, I have to say that we have used them to a considerable extent on both freight and passenger cars, and also on several of our tenders; and I am very well satisfied that they answer all the purposes for which they are intended. I believe the India-rubber will soon supersede all other springs for cars and tenders. Yours truly,

S. M. FELTON,
Supt. Fitchburg Railroad.

Office New Jersey Railroad Co., }
Jersey City, March 8, 1850. }

FOWLER M. RAY, Esq.,
Dear Sir: In answer to your enquiries respecting the operation of the Vulcanised Rubber Springs, purchased by our company from you some two years since, I reply that they are superior to any spring in use, (that I have either seen or heard of).

The improved form of your spring, consisting of a solid piece of vulcanised rubber with bands on the outside, is far superior to your first form, consisting of disks of rubber with metallic plates interposed.

The last named form was tried, if you recollect, at a much earlier period; and then was replaced by your last form.

I have no hesitation in saying that your springs have given entire satisfaction, and most cheerfully recommend them to railroad companies throughout the country for the following reasons:

- 1st. The cost is 30 per cent. less.
- 2d. Saving of weight on each car of 8 wheels from 700 to 900 lbs.
- 3d. Less care and attention is required, as they are not liable to get out of repair.
- 4th. A great saving is secured in the wear and tear of the cars and rails from their great elasticity.
- 5th. The freedom from noise.
- 6th. There is greater safety in case of accident, as they cannot be broken.
- 7th. The comfort of passengers is enhanced sufficiently to pay the expense, waiving all the other reasons that I have given.

Should this fail to satisfy any person enquiring, you are at liberty to refer to me, No. 150 Washington St., Jersey City. Yours respectfully,

T. L. SMITH, Supt.

New York, March 11, 1850.

I have used the Patent India-rubber Spring purchased of Mr. Ray, upon the cars of the New York and New Haven Railroad, and have found them efficient and economical; and when applied to the axles and draw springs, believe them to be quite equal to any in use. I have found a combination of these springs with a steel spring under the transom beam a very satisfactory arrangement, and am now using this plan in all new cars.

Yours respectfully,
ROBERT SCHUYLER.

February 25, 1850.

From practical observation of the use of the India-rubber Car Springs, manufactured and sold by your company, we are entirely satisfied in their application, and do not hesitate to recommend them as elastic, durable, requiring no repairs for years, and retaining their consistency during all extremes of weather. We have applied them for the past two years, and consider them superior for all railroad purposes.

Yours truly,

OSGOOD BRADLEY, Car Builder, Worcester.
T. & C. WASON, do. Springfield.
DEAN, PACKARD & MILLS, do. do.
DAVENPORT & BRIDGES, do. Cambridgeport.

Office of the New Jersey Railroad Co., }
Jersey City, March 7, 1850. }

This is to certify that we have had Mr. F. M. Ray's India-rubber Springs in constant use under our cars, and as Bumper Springs for upwards of two years, and they have in every way given perfect satisfaction.

The present form of spring we deem far superior to the form of Disk, having used both forms, although we have none of those made in Disks at present in use.

We take pleasure in recommending these springs to all railroad companies.

J. P. JACKSON, Vice Prest.
New Jersey Railroad and Trans. Co.

Roxbury, February 28, 1850.

In compliance with your request, I take great pleasure in stating the result of my experience in the use of "Ray's Patented Vulcanised India-rubber Car and Engine Springs." We have used them nearly two years, and never had one fail in any way. The cold weather does not affect them, as it has other rubber springs we have used.

With sixteen years' experience as superintendent of machinery on the Boston and Providence railroad, I take pleasure in saying that your springs are the best we ever used, or I ever saw used elsewhere. We have 20 cars rigged with them, of which I can say that the springs are as good now as when first applied. I put 24 lbs. of the rubber under the forward end of one of our heaviest engines, taking off 250 lbs. of steel springs—it has been in use 18 months, and is in as good condition now as when first put under the engine.

Very respectfully yours,

GEO. S. GRIGGS,
Supt. of Machinery, Boston and Prov. R.R.

Fall River, February 2, 1850.

In answer to yours of the 20th ult. I would say that this company has for some 10 or 12 months past been using "Ray's India-rubber Springs." We have applied them to both passenger and freight cars with uniform success. They have invariably preserved their elasticity and consistency through all the extremes of weather; and we are now applying them whenever the steel spring fails. I am well satisfied that they are particularly adapted for railroad purposes.

Very respectfully yours,

GEO. HAVEN,
Supt. Fall River Railroad.

Jersey City, March 9, 1850.

This is to certify that the present form of Mr. F. M. Ray's India-rubber Car Spring I consider far superior to the form of Disk, having used both forms.

I take pleasure in recommending these springs to all railroad companies. **DAVID H. BAKER,**
Foreman of Car Shop of N.J. R.R. & Trans. Co.

Harlem R.R. Depot, }
New York, March 7, 1850. }

This is to certify that we have used Mr. F. M. Ray's India-rubber Springs for over eighteen months, and find them to be easy and durable, and recommend them to railroad companies as being superior to anything we have tried.

J. M. SMART,
Foreman at 42d St. Depot.

Old Colony Railroad Office,
Boston, March 6, 1850.

EDWARD CRANE, Esq.,

President New England Car Co.,

Dear Sir: In compliance with your request I would state that the Old Colony Railroad Company have had in use upon their road, India-rubber Springs furnished by your company, for more than eighteen months past, during which time they have been extensively used under Passenger and Freight Cars, Locomotive Tenders, and for Drawer and Buffing Springs, with the most perfect success. The elasticity and consistency of the Rubber has never been unfavorably affected by either extremes of heat or cold—and from the experience which we have had in the use of Rubber Springs, I think them well adapted for railroad purposes—and therefore we have for some months past used Rubber almost exclusively, in all places where springs are required.

Respectfully yours, etc.,

JAS. H. MOORE,
Supt. O. C. Road.

Troy, February 27, 1850.

We have been using your India-rubber Car Springs for nearly two years—and we take pleasure in saying that in our opinion the rubber has to a certain extent already, and may eventually entirely supersede all other Springs for Railroad Car purposes. We now use it entirely for Draw Springs and Bumpers, considering it better and lighter than steel.

During our two years' experience in the use of it, we have not known any to lose their elasticity, or fail in any way; and we cheerfully recommend the rubber for railroad car springs. Very respectfully,
EATON, GILBERT & CO.

Passenger Car Linings.

THE Advertiser continues to make to order the Enamelled Car Linings which have been so highly approved the last three years, and are now exclusively used by all the Northern Railroads. No pains are spared to get out new styles, and adapt them to the tastes of every consumer.

Orders addressed to **CHARLES STODDER, No. 75 Kilby street, Boston,** will have prompt attention.
March 23, 1850. 2m

Ind^a-a-rubber for Railroad Cos.

RUBBER SPRINGS—Bearing and Buffer—Fowler's Patent—Hoses from 1 to 12 inches diameter, Suction Hose, Steam Packing—from 1-16 to 2 in. thick. Rubber and Gutta Percha Bands. These articles are all warranted to give satisfaction. Made under Tyer & Helm's patent, issued January, 1849.—No lead used in the composition. Will stand much higher heat than that called "Goodyear's," and is in all respects better than any in use. Proprietors of railroads do not be overcharged by pretenders.

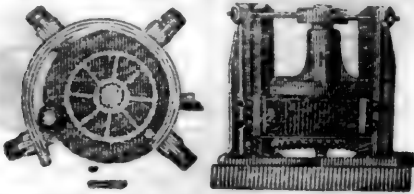
HORACE H. DAY,
Warehouse 23 Courtlandt street.
New York, May 21, 1849.

Spikes, Spikes, Spikes.

ANY person wishing a simple and effective Spik^e Machine, or a number of them, may be supplied by addressing **J. W. FLACK,**
Troy, N. Y.
March 6, 1850.

MACHINERY.

Henry Burden's Patent Revolving Shingling Machine.



THE Subscriber having recently purchased the right of this machine for the United States, now offers to make transfers of the right to run said machine, or sell to those who may be desirous to purchase the right for one or more of the States.

This machine is now in successful operation in ten or twelve iron works in and about the vicinity of Pittsburgh, also at Phoenixville and Reading, Pa., Covington Iron Works, Md., Troy Rolling Mills, and Troy Iron and Nail Factory, Troy, N. Y., where it has given universal satisfaction.

Its advantages over the ordinary Forge Hammer are numerous: considerable saving in first cost; saving in power; the entire saving of shingler's, or hammerman's wages, as no attendance whatever is necessary, it being entirely self-acting; saving in time from the quantity of work done, as one machine is capable of working the iron from sixty puddling furnaces; saving of waste, as nothing but the scoria is thrown off, and that most effectually; saving of staffs, as none are used or required. The time required to furnish a bloom being only about six seconds, the scoria has no time to set, consequently is got rid of much easier than when allowed to congeal as under the hammer. The iron being discharged from the machine so hot, rolls better and is much easier on the rollers and machinery. The bars roll sounder, and are much better finished. The subscriber feels confident that persons who will examine for themselves the machinery in operation, will find it possesses more advantages than have been enumerated. For further particulars address the subscriber at Troy, N. Y. P. A. BURDEN.

Railroad Spikes and Wrought Iron Fastenings.

THE TROY IRON AND NAIL FACTORY, exclusive owner of all Henry Burden's Patented Machinery for making Spikes, have facilities for manufacturing large quantities upon short notice, and of a quality unsurpassed.

Wrought Iron Chairs, Clamps, Keys and Bolts for Railroad fastenings, also made to order. A full assortment of Ship and Boat Spikes always on hand.

All orders addressed to the Agent at the Factory will receive immediate attention.

P. A. BURDEN, Agent,
Troy Iron and Nail Factory, Troy, N. Y.

CHILLED RAILROAD WHEELS.—THE UNDERSIGNED are now prepared to manufacture their Improved Corrugated Car Wheels, or Wheels with any form of spokes or discs, by a new process which prevents all strain on the metal, such as is produced in all other chilled wheels, by the manner of casting and cooling. By this new method of manufacture, the hubs of all kinds of wheels may be made whole—that is, without dividing them into sections—thus rendering the expense of banding unnecessary; and the wheels subjected to this process will be much stronger than those of the same size and weight, when made in the ordinary way.

A. WHITNEY & SON,
Willow St., below 13th,
Philadelphia, Pa.

Brown's Old Established SCALE WARE HOUSE,

NO. 234 WATER ST., NEW YORK.

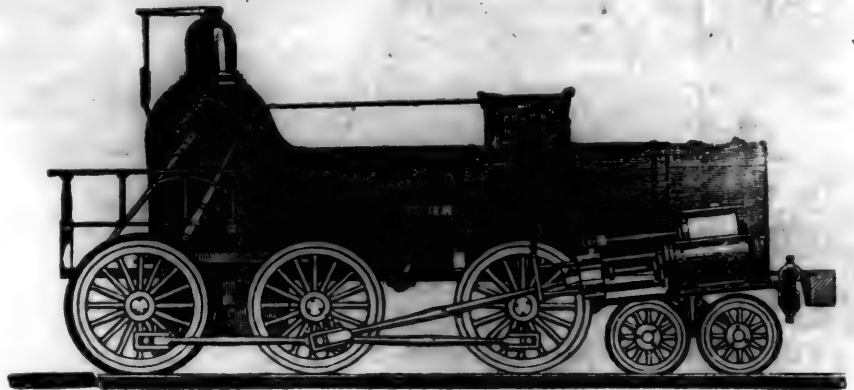
THE Subscriber, Practical Manufacturer of Scales of every description, respectfully asks the attention of Railroad Companies to his Improved Wrought Iron Railroad Track and Depot Scales which for strength, durability, accuracy, convenience in weighing, and beauty of workmanship, are not surpassed by any others in this country.

He is aware that this is rather a bold assertion for him to make, yet he can say with confidence that they have but to be tried to give them precedence over all others.

J. L. BROWN.

Bank Scales made to order, and all Scales of his make Warranted in every particular.

References given if required

NORRIS' LOCOMOTIVE WORKS.
BUSHHILL, SCHUYLKILL SIXTH-ST., PHILADELPHIA,

THE UNDERSIGNED Manufacture to order Locomotive Steam Engines of any plan or size. Their shops being enlarged, and their arrangements considerably extended to facilitate the speedy execution of work in this branch, they can offer to Railway Companies unusual advantages for prompt delivery of Machinery of superior workmanship and finish.

Connected with the Locomotive business, they are also prepared to furnish, at short notice, Chilled Wheels for Cars of superior quality.

Wrought Iron Tyres made of any required size—the exact diameter of the Wheel Centre, being given, the Tyres are made to fit on same without the necessity of turning out inside.

Iron and Brass castings, Axles, etc., fitted up complete with Trucks or otherwise.

NORRIS, BROTHERS

PATENT MACHINE MADE HORSE-SHOES.



The Troy Iron and Nail Factory have always on hand a general assortment of Horse Shoes, made from Refined American Iron.

Four sizes being made, it will be well for those ordering to remember that the size of the shoe increases as the numbers—No. 1 being the smallest.

P. A. BURDEN, Agent,
Troy Iron and Nail Factory, Troy, N. Y.

Etna Safety Fuse.

THIS superior article for igniting the charge in wet or dry blasting, made with DUPONT'S best powder, is kept for sale at the office and depot of

REYNOLDS & BROTHER,

2 So. Manufacturers, No. 85 Liberty St.

NEW YORK.

And in the principal cities and towns in the U. States. The Premium of the AMERICAN INSTITUTE was awarded to the Etna Safety Fuse at the late Fair held in this city.

November 3, 1849.

ly

COLUMBUS, OHIO,

Railroad Car Manufactory.
RIDGWAYS & KIMBALL,

HAVE established at this central point, the manufacture of Passenger, Freight, Gravel and Hand Cars for Railroads, and assure all Western Railroad Companies that it will be their constant aim to procure the best materials and workmen, and to turn out the best kind of work at fair prices. Specimens may be seen on the Columbus and Xenia Railroad. The patronage of Railroad Companies is respectfully solicited.

ly8

To Inventors and Patentees.

OWEN G. WARREN, ARCHITECT, Has had many years' experience as Agent for obtaining Patents, both in this country and Europe, and will transact such business promptly and reasonably. Persons at a distance can have their business done by correspondence—without the necessity of visiting this city or Washington. Office No. 94 Merchants Exchange, Wall st., corner of Hanover st., up stairs.

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AMERICAN RAILROAD JOURNAL.

STEAM NAVIGATION, COMMERCE, MINING, MANUFACTURES.

HENRY V. POOR, Editor.

ESTABLISHED 1831.

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SATURDAY, OCTOBER 12, 1850

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ASSISTANT EDITORS,

J. T. HODGE, *For Mining and Metallurgy.*
GEN. CHAS. T. JAMES, *For Manufactures and the
Mechanic Arts.*
M. BUTT HEWSON, C. E., *For Civil Engineering.*

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American Railroad Journal.

PUBLISHED BY J. H. SCHULTZ & Co., 136 NASSAU ST.

Saturday, October 12, 1850.

Illinois.

Alton and Sangamon Railroad.

After a lapse of some twelve or fifteen years, projects of internal improvement are again engrossing the attention of the people of Illinois.—The first settlers of this State, with their other ideas, carried with them to this, all the internal improvement spirit of the older States; and almost simultaneously with the formation of a State government, they formed magnificent projects of internal communication, such as would have done credit to the oldest and wealthiest States, and proceeded at once to the execution of these projects, entirely regardless of the want of all the conditions necessary to success. The remarkable speculative movement of 1835-6 happening at this juncture, supplied the means to commence their projected works. The result was what we now see was inevitable. With a very sparse population, without means of their

own, without experience of, or population to support, these works when constructed, as soon as the revulsion which succeeded the movement we have spoken of, deprived them of the means from abroad to carry them on, the whole fabric fell at once to the ground. Long lines of work designed for railroads were abandoned, some of which are now so covered with forests, that scarce a trace of them remains. Not a single one of the many schemes has been realised, save the Illinois and Michigan canal, which after remaining for years in an unfinished state, was finally completed by the aid of the foreign bondholders, in hope of saving a portion of former advances. Everything else fell in the general crash, and as far as the State was concerned, the future prosecution of these works was utterly abandoned.

The revulsion in the popular mind of the State was as violent as had been witnessed in the commercial world. From one pitch of extravagance the people of this State were led to another almost equally absurd. Their disgust at their ill success was only equalled by their former improvidence. They were as heartily sick of what they had done, as was the foreign capitalist whose money had been squandered. To prevent the possibility of the renewal of a similar state of things, they prohibited themselves, by a new constitution, from again engaging in their capacity as a State, in the construction of any works of internal improvement.

Since all this took place, the condition of things in this State has entirely changed. From 300,000 or 350,000 inhabitants in 1835, she now numbers 1,000,000. Her wealth has increased in much greater ratio than her population. Large commercial cities have grown up. Chicago, then a wilderness, now ranks as one of the important cities of the Union, and numbers 30,000 inhabitants.—The State now raises a vast surplus for export. Large and flourishing towns now exist in every part of it. No other State is increasing so rapidly, all things considered, and none possess such elements of future greatness.

Under the present condition of things, her people now feel the necessity of introducing among themselves all the improved means of locomotion which science has provided, and which are in use in older communities. Her vast surplus brings but half price for want of means to send it to market. The business community feels the need of better means

of travel than the soft prairie soil supplies. The State, extending some 400 miles in a northerly and southerly direction, interposes herself between a majority of the Atlantic States and the Mississippi. For the want of a railroad, or good ordinary roads, that part of the route from New York to that river, lying in Illinois, is more dreaded than the whole distance from that city to Chicago. The time has come, therefore, when the construction of railroads in this State is warranted, not only as offering a profitable investment of capital, but as demanded by the business wants of the country, precisely as is the construction of steamboats on the Mississippi river; and those now engaging in their construction are proceeding upon the same principles that prudent and cautious men observe in engaging in any other legitimate pursuit. In other words, they undertake these works because they promise a better return upon capital than any other. This return may to be sure be made up in part, in the increased value given to their property by these works. There can now be no doubt whatever that money in Illinois can be more profitably employed in the construction of railroads than in any other way.

The new impulse given to these works, therefore, is based upon substantial grounds. They are commenced and prosecuted as any other regular business transaction to make money. Their construction will be governed by similar rules that control all kinds of business; and under their application their progress will proceed safely and surely. This, like all other kinds of business, may be overdone, and subject to the revulsions which seem to be a necessary law in every kind of business; but under the guidance of self interest, they will be as free from these revulsions as any other pursuit. While all this is true, it is equally so that no State in the Union offers such inducements to railroad construction as this—none in which they can be constructed so cheaply, and none where the country will supply a larger amount of traffic. Through it must run a number of parallel lines, which will be the great thoroughfares for a large part of the Union.

Some of these lines that the State was unable to complete, and consequently abandoned, private enterprise is now re-commencing. One of the most important of these, is the *Alton and Sangamon railroad*, extending from Alton to Springfield, the cap-

ital of the State, a distance of 73 miles. This project, which has remained in abeyance since 1836, has been resumed under new auspices, with an energy and vigor, that promises to complete the whole line in about two years from the time of commencing the work. Such balance as was necessary to secure the construction of the road, which could not be obtained in Illinois, have been provided by subscription of New York capitalists to the stock. These have been made as an investment of capital. The amount taken here is about \$300,000. A majority of the directors also reside here. The President of the Board is H. A. Coit, Esq., whose connection with this work is a good pledge not only of the profitability, but of the success of the undertaking. The company is also largely indebted for its present success to another of the New York directors, through whose efforts the necessary means was provided, and the construction of the road resumed.

The final completion of this enterprise will exert an important influence upon other lines of railroad to be built in this State. Springfield is nearly on a line between Alton and Chicago; and the completion of the road to Springfield will be the signal for the extension of the line to meet the road now in progress from Chicago to LaSalle. These will constitute a direct route between Alton, St. Louis and the lakes. A rival to this line must be one that follows the same track. From Alton to Springfield it will constitute the main trunk line of the Northern Cross Road, which, by the terms of the sale of the State improvements on this line, is to be commenced next year. In this connection we would suggest that the Alton and Terre Haute road might use the whole or part of the Alton and Sangamon, and save the construction of a considerable extent of road. Such a connection would at present answer every useful purpose, till the former company shall have sufficient means for the building of a direct line. If Springfield should be too far north, the above road might intersect with the Alton and Sangamon, at *Carlinville*. This detour would add but little to the distance of the road from Terre Haute to Alton, and should be encouraged by the Alton people as tending more certainly to secure to that city the trade of the section through which it will run.

We do not know of a proposed road in the State which occupies a better line. It will connect the capital with the Mississippi by the shortest practicable route. It penetrates one of the most fertile, and the most densely inhabited part of the State. In addition to the advantages it will confer upon the section traversed by it, its completion will add so much additional means to the State, to be available in the opening of new lines.

From the Baltimore Patriot.
Baltimore and Ohio Railroad.

The following article on the Baltimore and Ohio railroad, from one who has taken pains to make himself personally acquainted with what he writes, will be read with pleasure by all who are interested in that great work. It explains systematically and clearly the present situation of the road, and the progress which is making in its extension to the Ohio river, and points out the important results which must follow its completion.

BALTIMORE AND OHIO RAILROAD.—ITS EXTENSION WEST.

Messrs. Editors—Holding, as the Baltimore and Ohio railroad does, a leading position among the public works of the United States, and as it appears to occupy an engrossing share of attention with the Baltimore community, your readers may regard with interest a communication descriptive of the new work.

The railroad in reaching its present terminus at Cumberland, traverses 179 miles; and overcomes in this distance an elevation of 600 feet above tide level at Baltimore. The extension commences at the Cumberland depot, and sweeping around and through the city to the northwest, strikes at once again for the left bank of the north branch of the Potomac. Thence availing of the Potomac valley the general direction is to the southwest as far as Savage river, 29 miles from Cumberland; and from that point, with a few deviations, nearly due west to Kingwood, thence northwest to the Ohio, and north to Wheeling.

The first work of importance upon the line is the Cumberland Viaduct. The grade at this point of the road is considerably above the grade of the streets across which the track is to pass. This fact coupled with a desire uniformly manifested by the engineer direction of the company, to embellish as well as subserve the more substantial interests of the contiguous country wherever the pecuniary interests of the company are not to be compromised—has substituted for a plain bridge, of unimposing dimensions, over Will's Creek (a tributary to the Potomac from the north) this superb viaduct.

The viaduct starts from about where the track meets the bridge lines, and spanning the intermediate streets, Church and Mechanic, abuts at the west end upon the base of Academy Hill. The entire length of the structure is 859 feet—the first 315 upon a gentle curve, and the remaining 544 a tangent. This length is distributed between 14 arches, 13 piers, and 2 abutments. The arches—with a span of 50 feet, rise of 13½ feet, and soffit width of 18½ feet—spring from piers, the 8 in Will's creek each 24½ feet in transverse length, 6 feet in width, and from 5 to 11 feet above the bed of the stream, (with suitable foundation courses underneath) and the 5 on firm ground, 18½ feet long and 8 feet in width, and heights varying with the ground. The water piers have rounded ends presented to the wash of the stream, the starting roundstones starting from the foundation offset, and ascending in semi-circular courses to the chord lines, and there capped by one large stone projecting over the courses below, and at the top cut in batter. The eastern abutment is 26 feet in length, and nearly 20 feet from ground line to the coping top; and has upon each side two pilasters, projecting 4 feet from the wall, with a thickness of 2½ feet. The western abutment is 39 feet in length, and in other respects similar to the eastern.

It will be at once perceived from the relative proportions of the span and rise of the arches, that each arch nearly approaches elliptic in section, each half arch being struck from three centres, with radii successively of 89 feet, 21 feet, and 45 feet. To the professional eye, the effect is exceedingly light and neat; and the more uninterested observer can hardly fail to appreciate the expedient adopted to preserve the grade and allow ample waterway for the stream, without sacrificing architectural symmetry. Although a portion of the viaduct is upon a curve, the dimensions of the curve are still such as to allow each arch to be set upon the chords of that curve—thus avoiding askew arches. The arches, now in course of erection and approaching completion, are laid upon centres so contrived, that as fast as one arch is turned, the centre may be removed to another arch; seven centres thus answering for fourteen arches—an important consideration in view of the cost of centre supports. The four parallel spandrel walls, which, with the arches, are of brick, rise with a batter so described, that while their combined bases shall cover the arch, to distribute the weight in due proportion, each spandrel wall shall also have on top a bed for the coping 2½ feet across—thus going up with sides continually changing in surface as the arch rises and wall batters; and presenting to the eye from above, a constantly winding surface. The outer spandrels are of course carried up in a vertical line. Crop walls ascending, within, from the pier head to the road bed, unite the interior walls, giving solidity to the structure. The thickness of the ring courses of the arches is three feet; and the total rise from the bed of Will's creek to the coping, which is to be cast iron, is nearly 30 feet.

The work has been carried up under careful and skillful superintendence, in a manner to challenge comparison with any similar work in the country.

It is an ornament alike to the city and the road.—The engineer officer particularly in charge, is Mr. Walter Smith, resident engineer.

Crossing Will's creek by this viaduct, the road is intersected by the track of the Maryland Mining company, on its way to the Canal basin. This passed, Academy Hill, proper, is penetrated by a through cut, in places of 45 feet cutting. Thence taking a southwesterly course, the road strikes the North Branch, within one mile from Cumberland, passing through broken ground on the spurs of Will's mountain, by heavy side cuttings in rock, comes out upon a fine tract, called from its length, the Four Mile Bottom, beyond the little village of Cresaptown.

Passing through the Four Mile Bottom, the road next strikes heavy ground at the foot of Fort Hill—a singular mountain formation independent of the two parallel ridges, Will's mountain and Dan's mountain; and after hugging the hill side for some distance, shoots out in a rather abrupt curve through rock cutting into another fine bottom tract, the Black Oak Bottom. Passing this bottom, the road is cut alongside of a bluff known by the local names of Cedar Point and Chimney Hole Rock, the last being tunnelled by a short excavation, fourteen feet by fourteen, to allow vent to a small stream otherwise obstructed by the embankment. From Chimney Hole Rock, the road crosses to an island in the Potomac, and continuing up this island about an eighth of a mile, again takes the Maryland shore, diverting the river into the right hand channel by a heavy embankment. Thence through some two miles of bottom and a few hundred feet of heavy cutting, the road again strikes the river about 21 miles from Cumberland; and here passes into Virginia. The bridge at this point, probably from the low grade taken to reduce embankment upon the long stretch of bottom land in the vicinity, and also from the nature and comparative scarcity of suitable stone, is to have a wooden superstructure.—There are two abutments and one pier, each span being 156 feet. The dimensions and details of the masonry, and character of the superstructure of this bridge, are not at present known to the writer—to his regret—for a new principle, or combination of principles, it is said, will be introduced in the work, which will render it one of much interest in a mechanical view. The construction is being rapidly pressed forward, under the direction of Mr. Henry Blackstone, the engineer in charge.

On the Virginia side of the river the features of the country remain the same. After three miles of light work, the road reaches New Creek, a stream from the southward draining, on the one side the Knobly spurs, and on the other the continuation in Virginia of the Maryland Dan's mountain. New creek is crossed by an iron bridge laid upon two abutments, and three piers 25 feet apart; the material of the stonework, a blue limestone, quarried near by. The Paddytown (a name notwithstanding its associations, a little classical in the past history of the country) depot will be located near this bridge. This depot, in furnishing the most accessible point to the larger parts of Hampshire and Hardy counties, will be a place of note in the thriving trade which the completion of the road is destined to draw from the upper Virginia counties to the Baltimore market.

From Paddytown, the road runs westward upon a tangent of nearly two miles over very favorable ground, and meets the Dan mountain range at Thunder hill. Here the road rises above the Cumberland limestone formation and strikes the upper strata of the old red sandstone. Thunder hill is turned by hillside cutting, and after three miles further of bottom and hillside, and in 27 miles from Cumberland, the road is opposite Westernport, a small town in Maryland at the mouth of George's creek. And here is tapped the great coal basin.

A short distance above Westernport, and on the Virginia bank of the river, the company have purchased a convenient tract for depot purposes. The depot buildings (and they are to be erected forthwith) will be of considerable size to accommodate a large extra force of locomotives with reference to the heavy summit grade which commences at about this point. The road here is 17 miles from the summit which divides the Mississippi waters from the Atlantic, and has to overcome in that distance an ascent of 1700 feet. This is accomplished with

a maximum grade of 117 feet to the mile; and in being accomplished solves the problem of years—the practicability of a locomotive track over the Alleghenies. The honor of the solution of this question is claimed for Mr. Benjamin H. Latrobe, the chief engineer of the company; for it is by the line run upon his own reconnaissance (adopted by the board of directors in preference to several other routes surveyed and passed upon by a board of consultation) that the road surmounts the barrier and passes on its course westward through the Glades. And to the same gentleman is also due the full credit of sustaining in his capacity as the head of the engineer corps, the responsibilities, and of meeting the demands, of the vast machinery embodied in the extension of this colossal work.

Two miles from Westernport, above the confluence of the Potomac and Savage, the road again strikes, crosses, and takes its final leave of the former river. The bridge at this point is one of the noblest structures on the line. Compelled by the rapidly ascending grade to cross at a point 50 feet below the stream, and 1000 feet above Baltimore tide level, the engineer has taken advantage of the ample sandstone quarries around, to make the bridge an enduring stone structure. The height of the bridge also gave full scope for a study of architectural effect, which resulted in the adoption of three full centre arches, each of 56 feet span, and 28 feet rise. Of the two abutments, the eastern is laid upon and backs on to a ledge of rock; and the western with a transverse length of 21 feet, 24 below the foundation offset, and 50 feet in height to the springing line, runs back 25 feet to the wing walls. These walls to sustain the immense pressure from behind, of an embankment averaging 45 feet fill for 300 feet, have a base 103 feet in length, and 11 feet in thickness; both of which dimensions diminishing by offsets as the pressure lessens, leave the wall at the top 30 feet in length by 4 in thickness. The wing walls are at right angles with the axis of the bridge, and are carried up straight 27 feet above the foundation offset, and thence stepped up in offsets 23 feet further. The two piers laid upon grillage foundations sunk below the river bed are 21 feet in transverse length, by 10 in width, above the foundation courses; and from the offset the eastern pier rises 11 feet, and the western 13 to the chord lines of their respective arches. From the same offset the starting round stones (semi-circular, as in the Cumberland viaduct) rise to within one foot of the springing lines, and are there capped by a heavy coping firmly bonded into the pier. The surface of this coping rises in the batter to the base of the pilaster, which ascends from each starting to the parapet coping; pilasters 4 feet by 2 also run up each side of the abutments. The arches are turned upon framed centres, with ringstones (voussoirs) 3 feet in length, 14½ inches in width at intrados, and 15½ at extrados, and in depth 4 feet or 2, according as they are horders or stretchers. In the interior, the spandrel recesses, instead of a solid backing, have two spandrel walls of brick rising in batter from the extrados of the arch to the road level, where they terminate in string courses for the track. Capping the side walls is a course of coping 4 feet 7 inches in width, by 1 foot in thickness with bevelled edges. The drainage of the structure is provided for by copper leaders set within the masonry.

The axis of this bridge is upon a tangent and is also at right angles with the course of the stream. As the road passes over upon the heavy grade, the lines of the bridge necessarily ascend with it, thus occasioning a difference of heights in the piers and abutments; but this difference of level is skillfully compensated by starting the west ring course in each arch one course higher than the east; in other words by placing cushion stones underneath—which preserves the symmetry of the whole. Two hundred and seventy-six feet is the length of the bridge. The building material of the main structure is a compact light colored sandstone; 2.03 in specific gravity; that is 169½ lbs. to the cubic foot. It is quarried near the bridge site, in massive blocks, which are laid in the best hydraulic cement. The Savage bridge was originally entrusted to a contractor, but was taken back by the company at an early stage of the contract. It has since been carried on by Mr. Gilbert H. Bryson, of Baltimore, the resident Engineer, and is now so well advanced

as without doubt to be ready for the transit of trains in ample time for the opening of the road.

Half a mile further of tolerably light work, along the hill side of a spur of the great Backbone, terminates the first division of the extension. The second division (in charge of Mr. George Hoffman) takes the road up the Savage and Crabtree valleys to the Backbone summit, and across the Glades to beyond the Maryland line. The third division (in charge of Mr. Thomas Rowles) extends beyond Kingwood to the Valley river bridge. The fourth division (in charge of Mr. James L. Randolph) extends to Fairmount, where the road crosses the Monongehala; and the remainder of the work as far as towards Wheeling as it is yet under contract, is in charge of Mr. Charles P. Manning. A description of this portion of the work will be prepared for your paper when the writer of this obtains the requisite details of information.

The first division is under the supervision of Mr. William H. Small, who as division engineer, has the whole work from Cumberland to Savage—the re-location, construction and the bridges—in especial charge. The division has four residencies, averaging seven miles each, of which the first residency is under Mr. Walter Smith; the second, Mr. Williamson Atkinson; the third, Mr. Black stone, and the fourth Mr. Gilbert Bryson—and under each resident engineer are two assistants. Particular care and circumspection were taken in the location of the first division, as being the *point d'appui* for the extension. Several different and distinct lines were run from, and in the vicinity of Cumberland; and the present line adopted among these as the most eligible as well as economical. And the subsequent execution of the work has been in keeping with the pains and skill bestowed on the location. The cuts are brought down to the lowest slopes and drained with ample ditches; the embankment is sheathed with rock riprappling wherever exposed to the river wash; and the small bridges and culverts laid in a thorough and substantial manner. So that when the road is completed, the directors will have at their hands a line located upon the test of repeated surveys, and a work in all its details—graduation, masonry and track superstructure—constructed upon the experience and experiments of years.

The first thirty miles from Cumberland to Savage river will be finished at the time indicated by the Chief Engineer, early in the coming season. As to this there is no question; the cross ties are now being delivered on the track. The remainder of the work is in a similar state of forwardness; and if the prediction of Mr. Latrobe—of an unbroken railroad connection between Baltimore and the Ohio by the summer of 1852—is not fully verified, then there is “no certainty in human affairs.” This of course presumes a prospering condition of the company's finances which has thus far marked their administration under president Swann. And that such will be the case would seem assured by the fact of the rise of the company's stock from 44 a 44½ in September, 1849, to 72 a 83 in 1850; and the company's state bonds in London—an incontestable evidence of confidence at home and credit abroad.

M.

Internal Improvements in the State of New York.

A Sketch of the Rise, Progress and Present Condition of Internal Improvements in the State of New York.

NUMBER I.

In the annual message of Gov. Tompkins, in 1816, he submitted to the Legislature the question of connecting the waters of the Hudson with those of the western and northern lakes, and expressed a reliance on the co-operation of the western States, and Vermont, in any judicious plan to effect that object.

The commissioners made a short report, in which they stated that “during the late war it was impracticable to carry on any further operations to forward the objects of their appointment;” but they express increased confidence in the importance and practicability of the work, and recommend appropriations to employ engineers, and to commence the middle section, from Rome to Seneca river, as not only the most feasible part of the work, but which would tend to “divert the trade from passing

down the Oswego river to Lake Ontario and Montreal.” The charge for carrying a barrel of flour from Cayuga Lake to Montreal, in 1815, was \$1 50, and to Albany \$2 50.

Previous to the meeting of the legislature in 1816 steps had been taken to prepare the public mind in favor of the direct canal from Lake Erie to the Hudson. Judge Platt states that soon after the war ended, he had a consultation with Mr. Clinton and Mr. Eddy, and it was agreed to invite about a hundred gentlemen of New York to meet at the City Hotel for consultation in regard to the canal. This meeting was held in the autumn of 1815; William Bayard being chairman, and John Pintard secretary. Judge Platt made an address to the meeting, pointing out the general advantages of the canal, and the peculiar interest of the city in its construction; and in reference to the “stupendous project of an uninterrupted incline plane, which had been unfortunately proposed in the first report of the commissioners,” Judge Platt says he “urged the expediency of a formal and public abandonment of that plan, for the simple mode afterwards adopted, of following the general surface of the country in its undulations. DeWitt Clinton, Thomas Eddy, Cadwallader D. Colden and John Swartwout were selected to prepare and circulate the memorial in favor of the Erie canal. This justly celebrated memorial was drawn by Mr. Clinton, and, as stated by Judge Platt, “the friends of the canal throughout the State, rallied under the standard of that memorial,” and held meetings in Albany, Utica, Geneva, Canandaigua and Buffalo, to second the efforts in New York, and petitions to the legislature were circulated and signed in most of the western counties. Dr. Hosack, in his memoir of Mr. Clinton, states that “this memorial was signed by a great portion of the respectable citizens of New York, and was seconded by the corporation of that city.”

The memorial alludes to the chain of mountains which passes through the United States, which divides them into Eastern, or Atlantic, and Western, and to the fact that the Hudson river has a tide navigation of 160 miles; and the tide in no other place ascends higher than the Granite Ridge, or within thirty miles of the Blue Ridge, or eastern chain of mountains; whereas, in the Hudson, the tide breaks through the Blue Ridge, and ascends above the eastern termination of the Catskill, or great western chain; and there are no interposing mountains to prevent a communication between it and the great western lakes. It considers Montreal and New Orleans as the great rivals of New York: one relying on the St. Lawrence, and the other on the Mississippi, and it gives the distance from Buffalo, the proposed termination of the Erie canal, to the ocean, at 450 miles, by way of New York; 800 by Montreal; and by New Orleans 2,350 miles. And from Chicago to the ocean, by N. York, about 1,200; New Orleans 1,600; and Montreal 1,600. It then alludes to the Niagara portage and the rapids of the St. Lawrence, compelling them to load and unload three times, as obstacles to the northern route to the ocean; and the portage between Chicago and the Illinois river, as an obstacle in the Mississippi route. These impediments have been removed by the Welland and Illinois canals, from the usual routes, within a few years, and yet the Erie canal maintains its supremacy over those and its other rivals which have been created.

The memorial deprecates the contrariety of opinion in regard to the route from Rome to Lake Erie, and takes decided ground in favor of the interior, against the Ontario route; intimating that a canal by the latter route was impracticable; a position which the construction of the Erie canal has shown to be erroneous.

The memorial estimates that the Erie canal will be the work of ten or fifteen years, and that the expenditure, in order to be beneficial, ought not to exceed half a million of dollars a year; and it says, “great care ought to be taken against high tolls, which will certainly injure, if not ruin, the whole enterprise.” It recommends that the State should

* The New York memorial, with the original signatures, is preserved in the office of the Secretary of State at Albany, in vol. ix of the manuscript documents of the legislature, pp. 156 and 157.

"achieve this great work," and that it could be done by borrowing money and issuing stock, providing the ways and means to pay interest; referring to the salt duties and State lands as sources of revenue. It also alludes to donations of 106,000 acres of land from the Holland Land Company, and anticipates more than a million of dollars from these and other donations. The sum realised from grants of land has fallen far below this estimate. After holding the lands given by the Holland company until 1831, and exempting them from taxation for fourteen years, the State sold the whole tract for \$28,210 26. The proceeds of the Hornby and Granger tracts did not exceed \$1000, making a total sum realised from donations of lands of a little more than \$32,000. This is exclusive of the grants of the right of way for the canal.

Alluding to the fears of the dismemberment of the Union, the memorial says: "The commerce of the ocean, and the trade of the lakes, passing through one channel, supplying the wants, increasing the wealth, and reciprocating the benefits of each great section of the empire, will form an imperishable cement of connection, and an indissoluble bond of union." New York being both Atlantic and western, is exhorted, in glowing terms, to put forth her strength to accomplish a work, which in its effects may tend to preserve the union of the States, and thus "prevent a train of the most extensive and afflicting calamities that ever visited the world."

Mr. J. R. Van Rensselaer, from the joint committee, made a report, and introduced a bill "for improving the internal navigation of this State," authorising two millions of dollars to be borrowed, and the Erie and Champlain canals to be commenced. The bill was strenuously opposed in the Assembly, and a more cautious policy recommended. Judge Duer introduced a substitute, appointing commissioners, and providing means for procuring fuller surveys and estimates to be reported to the next Legislature. After long discussion, this substitute was amended, by authorising two hundred and fifty thousand dollars to be borrowed annually, and the total sum not to exceed two millions of dollars. In this shape it passed the Assembly on the 15th of April, by a vote of 91 to 18. The Senate, on motion of Mr. Van Buren, by a vote of 20 to 9, struck out so much of the bill as authorised the commissioners to borrow money, and commence operation on the middle section of the Erie canal, retaining the five sections originally offered by Judge Duer in the Assembly. The names of the thirteen commissioners sent from the Assembly were erased, and the names of Stephen Van Rensselaer, De Witt Clinton, Samuel Young, Joseph Ellicott, and Myron Holley, were inserted; the acts of 1811 and 1812 were repealed, and a new section was added, appropriating \$20,000 to pay the expenses of completing the surveys, maps, etc. The Assembly, after considerable discussion, finally concurred in these amendments, by a vote of 43 to 34. This concurrence was brought about mainly by the active zeal of James Lynch, an ardent friend of the canal, and then a member from Oneida.

The commissioners appointed by the law of 1816 met in New York in May, and appointed Mr. Clinton president, Col. Young secretary, and Myron Holley treasurer. Col. Young dissented from a majority of the commissioners, as to the policy of sending abroad for an engineer, contending that competent skill could be found in our own country, and that the experience of a European engineer would avail him but little in constructing a canal through our forests and marshes.

The Erie canal was divided into three sections, and a chief engineer assigned to each. The western section, from Lake Erie to Seneca river, was committed to the care of James Geddes; the middle section, as far as Rome, to Benjamin Wright; and the eastern section, as far as the Hudson, to Chas. C. Brodhead. Col. Lewis Garvin was assigned to the Champlain canal.

In February, 1817, the new commissioners made their annual report, in which they give the dimensions fixed for the canal as follows: width, at water surface, 40 feet; at the bottom, 28; depth of water, 4 feet; length of lock, 90 feet; width, 12. The Erie canal was originally constructed according to these dimensions.

The distance from Lake Erie to Albany was reported at 353 miles 29 chains. The Erie canal, when finished, measured 363 miles, exclusive of the Albany basin. The rise and fall from Lake Erie to tide water was reported at 661 feet 35 hundredths, requiring 77 locks. Lake Erie 564 feet 85 hundredths higher than the Hudson, and 145½ feet higher than Rome.

The cost of the Erie canal was estimated
at\$4,881,738 00
Of the Champlain canal 871,000 00
\$5,752,738 00

The actual cost of constructing the—
Erie canal was\$7,143,789 86
Champlain canal... 1,257,604 26
\$8,401,394 12

Difference\$2,648,656 12

The commissioners say they "entertain no doubt but as much money can be obtained in this country as may be required for the canal, on the credit of the State, at an interest of six per cent., by the creation of a funded debt, and that ample funds may be appropriated for the payment of the interest, and the gradual extinguishment of the debt, without the imposition of taxes." Of the loans for the Erie and Champlain canals, three millions were borrowed at 6 per cent., and four millions at 5 per cent.

The whole subject, in reference to the internal navigation of the State, was referred to a joint committee of the two houses, of which Mr. Ford, of the Assembly, was chairman. This committee made a report in March, 1817, urging the purchase of the rights of the Western Inland Lock Navigation Company, and the immediate construction of the middle section of the Erie canal, and the commencement of the Champlain canal. The report recommended the organization of a board of commissioners of the Fund for Internal Improvements, to consist of the Comptroller, Secretary, Attorney General, Surveyor General, and Treasurer, and presented the details of the system of finance for the establishment and management of the canal fund, which was embodied in the act of 1817. The committee also presented to the Legislature a proposition from J. R. Van Rensselaer, of Columbia county, to complete the Erie canal for the State for ten millions of dollars; or for seven millions, and the tolls for twenty years; or for five millions, and the whole tolls for twenty years, and one half of the tolls forever thereafter. In either case, the State was to advance half a million, on security for a million, and, on proof that the money was expended on the work, another half million to be advanced, until the work was completed. The committee consisting of Messrs. Livingston, Tibbits and Swift of the Senate, and Messrs. Wm. D. Ford, Pendleton, Child, Eckford and Wilcoxson of the Assembly, gave a decided opinion against accepting the proposition, urging that "the State should retain perfect control of this canal, in every period of its construction and future regulation."

The report gives the cost of transportation from Buffalo to Montreal at \$30 a ton, and the returning transportation from \$60 to \$75. "The expense of transportation from New York to Buffalo is about \$100 a ton, and the ordinary length of the passage twenty days." The committee estimate that with a canal, the cost of transportation from Buffalo to New York would be from \$10 to \$12 a ton. The transportation from Buffalo to Albany has averaged \$7 78 a gross ton for the last twenty years; and from Buffalo to New York the average would be about \$8 81 for the same period. The cost of transporting merchandise from Albany to Buffalo has averaged \$16 12 per gross ton for the last twenty years. Putting the cost of merchandise at \$17 50 per ton from New York to Buffalo, and it shows a gain of \$82 50 per ton, compared with the cost before the canal was constructed; and on products

* This is the average from 1830 to 1850. For the last three years, the toll on 100 lbs. of merchandise has averaged 24 cts., and the freight 15 cts., equal to 39 cents per 100, or \$8,73½ per gross ton from Albany to Buffalo. For four years, the toll on a barrel of flour, from Buffalo to Albany, has been 31 cents, and the freight 33½ cents; equal to an average of \$6 61 per gross ton, on 364 miles of canal navigation.

coming from Buffalo to New York, the saving exceeds \$91 per gross ton.

Before making his report, Mr. Ford addressed a letter to Mr. Clinton, as president of the board of commissioners, and received an answer giving most of the details in regard to the canals, and the system of finance, which are embraced in the report of the committee; and in the act of 1817. One member of the committee, however, George Tibbits, of the Senate, had an important agency in maturing and perfecting the system of finance contained in the act of 1817. The auction and salt duties, and other funds set apart by the act of 1817, furnished an amount more than sufficient to pay interest on all the money borrowed for the Erie and Champlain canals, until the payment of the principal was provided for. And this system of finance furnished the necessary means to reimburse the principal of the whole debt in about nineteen years from the passage of the law. The tax of two hundred and fifty thousand dollars authorised to be assessed on lands within twenty five miles of the canals, from the Mohawk to the Seneca river, and from Lake Champlain to the Hudson, was never collected.

The bill, as it passed the Assembly, provided for making the loans on the credit of the canal funds set apart by the first section, and when it came up for consideration in the Senate, Mr. Van Buren proposed to modify it so as to make the loans "on the credit of the people of this State," and made a strong speech in favor of the bill. This motion was adopted by a vote of 16 to 11. On the final vote the bill passed 18 to 9. Messrs. Tibbits, Van Vechten, Swift, Cochran, and Cantine, also advocated the bill in the Senate. In the Assembly, Messrs. Duer, Ford, Beach, of Cayuga, and Barnes of Oneida, were among the principle advocates of the bill.—*Merchants' Magazine.*

To be continued.

From the Journal of the Franklin Institute.

INVESTIGATION OF THE COMPARATIVE MERITS OF THE PERPENDICULAR AND RADIAL PADDLE WHEELS FOR SEA-GOING VESSELS. By B. F. Isherwood, Esq., Chief Engineer U. S. Navy.

Continued from page 626.

Let us suppose, now, the same depth of immersion for the radiating paddle wheel, whose arm, as before, with a radial paddle at its extremity, is just entering the water at an angle of 45°, and having, as before also, the same less horizontal velocity than the velocity of the vessel. There is now no loss of reactionary force, but there is the loss by oblique action; and as the angle is 45°, it follows that half the force applied to the paddle is expended in lifting the vessel. This result, however, as with the perpendicular paddle, is too minute to be appreciable. The proportion now, of this lifting force to the total power applied to the paddle under consideration, is fifty per cent.—with the perpendicular paddle 25 per cent, to which must be added 25 per cent by reactionary loss. Hence there would be no superiority, economically, of the particular perpendicular paddle under consideration over the radial paddle, at this maximum immersion, in practice; but they would exactly equal each other, supposing, of course, the same horizontal velocity for each, and that horizontal velocity equally less than the velocity of the vessel.

This equality of loss is true, however, but of three positions of the paddles, viz., when the arm carrying them is either horizontal or vertical, or intermediate; that is, at 45°. In the first case, the wheel would be immersed to its axis; then, the radial paddle coinciding with the arm, all the power applied to it would be expended in vertical pressure only; and the perpendicular paddle at right angles to the arm, would cause a loss of the whole reactionary force applied to it. In the second case, both paddles would expend the whole power applied to them in the propulsion of the vessel. In the last case, as has already been shown, the loss of reactionary and lifting force by the perpendicular paddle, and by oblique action of the radial paddle,

† The Legislature of 1817, in regard to internal improvements, was unusually wise, and while it secured the regular progress of the Erie and Champlain canals, it preserved the credit of the State, and secured the people against taxation.

is equal, and amounts in both to 50 per cent. But this equality does not exist at any point between the angle of 45° and a horizontal and perpendicular position, and this results from the fact that the loss of labor by reaction and lifting, is in proportion to the *sines* of the angles, while the loss by oblique action is in proportion to the *squares* of the same sines.

Supposing, now, the purely imaginary case where the vessel has a greater velocity than the horizontal velocity of the paddle having the greatest horizontal velocity, and the wheel to be immersed to its axis; we should then have the following losses by two kinds of paddles, calculating the reactionary and lifting loss by the perpendicular paddle as the sines of the angles, and the oblique action loss by the radial paddle as the squares of the sines of the same angles—supposing the arms of the two wheels the same in number, and to be in corresponding positions.

Angle of arm with surface of water.	Perpendicular paddle. Loss by reaction and lifting.	Radial paddle. Loss by oblique action.	Difference in favor of perpendicular paddle.	Difference in favor of radial paddle.
	p. ct.	p. ct.	p. ct.	p. ct.
0° or horiz'tl.	100	100	0	0
5°	92	90	7	
15°	79	93	14	
25°	68	81	14	
35°	59	66	7	
45°	50	50	0	0
55°	41	34		7
65°	32	18		14
75°	21	7		14
85°	8	1		7
90° or perp'lar.	0	0		0

Totals, 450 450 42 42

In the above supposed case, then, we perceive there would be no choice between the two kinds of paddles, as they operate equal losses—the sum of the losses of each being equal and expressed by the number 450. Moreover, we perceive that, in going from 0° to 45°, the losses by the perpendicular paddle are less than by the radial paddle by the number 42; and that, in going from 45° to 90°, the losses by the radial paddle are less than by the perpendicular paddle by the same number, 42; further, that at midway between 0° and 45°, and 45° and 90°, the difference is at its maximum. Our supposed case is wholly an impossible one, but is adduced to explain the different actions of the two kinds of wheels. Practically, we must confine ourselves to the consideration of the mean case, where the wheels have an immersion of 5½ feet, and a slip of 20 per cent.

Referring now to our wheel of 28 feet diameter, 5½ feet immersion, and 20 per cent slip, the paddles would begin to enter the water when the arm bearing them made an angle of about 35° with the surface of the water, and would come into propelling action when the same arm made an angle of about 50° with the surface of the water. How would the proportion of losses by the two kinds of paddles now stand?

Premising that the loss by oblique action begins when the radial paddle enters the water, and continues till it reaches a vertical position, and that the reactionary loss by the perpendicular paddle is confined between the points where it enters the water and where it comes into propelling action, and that the amount of power applied to each whole paddle, in each position taken, equals unity or 100, the paddles acting during equal times, and if but a fraction of the whole paddle act, then the power applied to it will be that fraction of 100; and if the paddles act during unequal times, then the power applied to each will be in the proportion of the time it acts. Now from the angle of 35° to 90° we have taken six positions, in only the last four of which, however, the whole paddle acts during equal times. In the first position only about ¼th of the whole paddle acts, and that but for half the times of the others, viz., the power applied to it will then be 1-16th of 100. In the second position only about ½ of the whole paddle acts; the power applied to it will then be half of 100. The whole power applied will therefore be represented by 400 ÷ 64 ÷ 50 = 456½. The reactionary loss obtains for the first and second po-

sitions only, and for the first position, (taking the per cents of loss from the foregoing table,) will be 1-16th of 59 = 3.7. For the second position ½ of 50 = 25; total, 3.7 + 25 = 28.7. Then the whole power applied being represented by 456½, the whole power expended in reaction and lifting will be represented by 28.70, or 6.3 per cent nearly.—The difference in favor of the perpendicular paddle over the radial paddle is therefore 18½ - 6.3 = 12 per cent in round numbers. From this 12 per cent must be deducted the per cent of power absorbed in the friction of the eccentric strap, and journals of the levers of the perpendicular paddle wheel. That per cent of friction can only be determined by experiment. Taking it, however, at 10 per cent we perceive that, with equal slips, viz., 20 per cent, which is about the least that it is advisable to give, or is given in practice; and with a depth of immersion of 5½ feet for a 28 feet diameter wheel, which is the maximum mean immersion for the largest steamship making long voyages, the perpendicular paddle exceeds the radial paddle economically by 2 per cent. If the slip be varied from 20 per cent so as to become greater, or if the immersion be increased beyond the proportion of 5½ to 14, (the radius of the wheel,) the per cent in favor of the perpendicular paddle will be greatly increased. The only conditions under which a superiority can be given to the radial paddle are those of small immersion and small dip.

The per cent of loss by friction with the perpendicular wheel having been determined, and being allowed for, a simple calculation, similar to that above given, will easily ascertain the relative excellence of the two kinds of paddles in any given cases, when the slip and immersion of each are known.

I shall now proceed to determine this friction from such data as I am possessed of, on vessels using the two different wheels. For this purpose I have selected two vessels whose performances are given by the English Admiralty at a measured mile in the Thames river. The dimensions of the vessels are as follows:—

	"BLACK EAGLE."	"TRIDENT."
	Perpendicular paddle.	Radial paddle.
Hulls.		
Length on deck.....	155 feet	195 feet
Beam ".....	26 "	31 "
Depth of hold.....	14 5-6 feet	18 "
Mean draught of water. 10½ "		11 "
Displacement.....	600 tons	900 "
Immersed amidship section.....	200 sq. feet	252 sq. ft.
Paddle Wheel.		
Effective diameter.....	30-25 feet	30-67 feet
Radius of circle of centre of reaction.....	9-60 "	9-77 "
Radius of rolling circle. 7-75 "		7-59 "
Breadth of paddle.....	4-17 "	2-00 "
Area of one paddle.....	22-90 "	18-00 "
Immersion of lower edge of paddle....	4-96 "	2-08 "
Engines.		
Number of steam cylinders.....	2	2
Diameter.....	62 inches	70½ in.
Stroke of piston.....	4½ feet	5 "
Number of double strokes per minute.....	23½	22
Mean effective steam pressure in the cylinder throughout stroke. 17 lbs		17 lbs.
Actual horse power developed by engines.....	665	891
Speed of vessel in statute miles per hour.....	13-14	11-92

The calculations we are about to make, have for their object the determination of the friction of the lever journals, and of the eccentric strap of the perpendicular paddle, in per cents of the total power developed by the engine. To effect this there must be calculated for the two vessels the losses, (omitting the friction loss by the perpendicular paddle wheel,) by their respective paddle wheels, viz., in the "Black Eagle" by slip and reaction, and in the "Trident" by slip and oblique action.—To these must be further added the power, in per cents, which has been found in practice required to work the engine, and to overcome the friction of the load. The remainder of the power will be con-

sidered as that utilized in the propulsion of the vessel. The vessels, however, are of different dimensions, and the power required to propel them at equal speed will be as their resistances multiplied by their respective immersed amidship sections.—These resistances will be in the compound ratio of their immersed amidship sections and displacements. The previous remainder of the power being multiplied by these co-efficients of resistance inversely, will represent the powers proportionally to the resistance they overcome. The final comparison is now readily made, by taking these proportional powers as the measure of the powers, and the cubes of the speeds of the vessels as the measure of the effects.

To be continued.

Copper Mines of Lake Superior.

Perhaps at no time since the commencement of mining operations within the region bordering on Lake Superior have the prospects of this section been more promising or its business more actively prosecuted than at the present period. Mining and explorations are now prosecuted upon a basis far different from that which generally characterized the ephemeral operations of 1845 and '46, and although the errors, disappointments and losses to the multitude consequent upon the total want of knowledge and experience in those concerned might have been safely predicted, these tended, nevertheless, to create in the minds of many, doubts as to the real wealth of the country, which nothing but the strongest evidence could have removed.

Late developments as well in the copper as in the iron region have served to dispel these doubts in all concerned, and universal confidence now seems to exist that the apathy and mistrust which have prevailed are past to return no more. Soon the waters of our noble lake will be connected by a ship canal with her kindred waters, then will the exhaustless treasures of the Upper Peninsula, unrivalled in extent and quality, be poured out until they shall form one mighty and increasing stream of wealth, enriching alike our citizens, our state, and our common country.

The following hasty estimate will not vary far from the amount of copper in the rough, which will be sent down from Lake Superior during the present year, viz:

Boston and Pittsburgh Co about.....	1,800,000
North West ".....	400,000
North American ".....	120,000
Minesota ".....	200,000
Siskawit ".....	60,000
All others, not over.....	100,000

Being a total of.....2,680,000

There will be employed this winter in operation connected with mining, about 1,000 operatives.—The following remarks are made without vouching for their perfect correctness, they are made with the belief derived from the best information within our reach, and are believed to be generally correct.

The Cliff Mine, owned by the Boston and Pittsburgh Co., will send down this summer somewhat less than last year; those who should know, however, say that the mine was never looking better than at present, and that it is now in a position to more than make up in the coming year any deficiency in this. There has been lately found upon this location a new vein, said to be fully equal in promise to the mine now worked. Should this prove equal to what is expected, the annual dividend of this company can without difficulty be made \$30 or \$40 per share, the original cost of which shares, including all assessments, was about \$30 per share—they are now selling at about \$100.

The North West is getting on famously and next to the Cliff they will this year send down more than any other mine on the lake.

The North American is doing well—a rich feeder has lately been struck near the bottom of the mine, which has materially improved its character.

The Cape, Iron City and North Western are working upon prospects, which are considered by those acquainted with them, as only needing labor to develop rich resources and the party engaged

thereon are men who will not allow them to fail for want of either energy or means.

Upon the Ontonagon the Minnesota Mine is looking extremely well; their stock has advanced very rapidly since the commencement of the season, and is now in demand, we believe, at \$100 per share.

The Adventure mine looks very well and is improving in regularity and their ground is extremely rich.

The Ridge mine looks well—they are now sinking a shaft, which, thus far, in richness, has been seldom excelled.

The Ontonagon Mining Co. have lately commenced work upon a very large and regular vein, which upon the surface appears to be a counterpart of the Minnesota vein. It has thus far produced only stamp work. They are now bringing up an adit, which will drain the mine to the depth of 120 feet.

The Piscataqua mine, the work upon which is just commencing, has a large promising vein, rich in copper and accompanied by extensive Indian Diggings. This vein is about 4 feet in width, and can be traced by the ancient works for a long distance.

The Forest Mine has not been worked extensively this summer. They have constructed a road to the river at great expense of time and labor, and have done a vast deal of other work; and are now prepared to commence mining in earnest. They have a vein easily worked, carrying copper richly disseminated.

The Ohio Trap Rock has not been worked for the last year, but they are about to recommence operations. We understand a sale was made, a short time since, of about 1000 shares at \$12 per share.

The Norwich Co. are also recommencing operations upon their mine which has not been worked for the last two years. It is said, they have a good show.

The Algonquin Co. are sinking a perpendicular shaft upon their vein which they have just intersected. They have a very large vein, which in places where it makes its appearance, is very rich. They recommenced operations last spring, having done nothing for several years.

The Douglass Houghton Co. are sinking and drifting on a vein that is said to be improving in its character. They have already out some masses and a quantity of excellent stamp work.

The Merchants Mining Co. will commence work this fall, as will also the Chesapeake Mining Co. The locations of both of these Cos. present very favorable indications. There are also three other companies which will probably be worked on the Ontonagon, but it is not yet certain.

On Isle Royale the Siskawit Co. are doing well. Their shaft is about 60 feet deep—lode in the bottom two and a half feet wide, and rich in stamp work. They have about completed their stamp works.

The Ohio and Isle Royale Co., the Pittsburgh and Isle Royale Co. will carry on operations on the island during the winter.—*Lake Superior Journal.*

Ship Building in New York.

Continued from page 627.

WILLIAM H. COLLYER.

The St. Lawrence, a steamer for the Portland Steamboat Association, is just off. She is a handsome craft, 300 tons burden, 225 feet long, 28 beam, 10½ hold. Her route will be from Portland to Boston, and she is well calculated to stand the rough usage of that coast. Her engine, built at the Morgan Works, is 44 inch cylinder, 11 feet stroke. We believe Capt. J. B. Coyle will command the *St. Lawrence*.

A Steamship is on the stocks for Morgan & Harris, intended for service between New Orleans and Brazos Santiago. Her dimensions are: burden, 1,200 tons; length, 215 feet; beam, 33; hold, 16.—Her engine, building at the Morgan Works, will be 56 inch cylinder and 10 feet stroke. She is an uncommonly strong vessel; will be launched, probably in 10 days.

JEREMIAH SIMONSON.

The Prometheus, launched a few days since, is owned by Capt. Vanderbilt, or rather by the Nicaragua Ship Canal Company. She is a fine steam-

ship, of 2,000 tons, 240 feet long, 35 beam, and 22 hold, with a promenade deck, seven feet above the main deck. Capt. V. has superintended her construction himself, and the builder has made her a first-class vessel.

A steamboat, of only 100 tons, 100 feet long, 20 beam and 5 hold, intended to run up the San Juan, was launched about the 1st of July. She belongs to the canal company.

Another steamboat, of only 65 tons, 80 feet long, 20 beam, and 4½ hold, destined for the same place, was launched about the same time.

THOMAS COLLYER.

The Carribean, a steamship of 1,800 tons is now under way at this yard. She is 240 feet long, 31 beam and 23 hold; she is to be commanded by Capt. J. J. Wright, formerly of the *Alabama*, and is owned mainly by him. The *Carribean* will run with the *Alabama* between New Orleans and Chagres. Her engines, building at the Phenix Foundry, will be 52½ inch cylinder and 10 feet stroke, of the beam pattern, showing the novelty of two walking beams, as was once in practice on a North river boat. The *Carribean* will be launched in about two weeks.

Williamsburgh.

PERINE, PATTERSON & STACK.

The Lady Franklin, a beautiful packet ship, named after the wife of the lost navigator, was launched early in July. She is said to be one of the best ships ever built in the United States. Her cabin is extremely neat and elegant, and her state rooms are furnished in a style seldom attempted on board sailing vessels, and conspicuous among them is Lady Franklin's state room, fitted for the exclusive accommodation of that lady, should she feel disposed to pay America a visit. The second cabin is also a most airy and comfortable place, and very commodious. The accommodations for the steerage passengers are a great improvement. The bunks (as also in the second cabin) are all hung in moveable iron frames, and can be removed in a minute, if more room be required for stowage. The cooking apparatus for the steerage passengers is "Yeaton's Patent," by which upward of twenty can bake, boil and roast at one and the same time, and completely protected from the weather. There is also an hospital on the centre of the upper deck, capable of accommodating about a dozen patients; and water closets for each class of passengers.—Nothing is wanting for the comfort of all. She is built for S. Thompson & Nephew's line, and is commanded by Capt. S. Yeaton, well known as commander, successively, of the *Oxford* and *Fidelfia*. The following is a description of her build: Dimensions—180 feet long, 40 feet beam and 23 feet hold, with long poop deck and verandah; mid-ship house and top gallant fore-castle; 18 frames forward and aft of live oak, all dead wood; and kelsons forward and aft of live oak, locust and cedar; fourth futtocks, tops and stanchions; 2 thick garboard streaks, 8 and 7 inches thick, bolted thro' the sister kelsons in every timber, and bolted vertically into the main keel every 30 inches; 4 inch bottom planks, with 21 streaks of 5 inch whales, all square fastened and butbolted; plankshire and rail, 6 inches thick; 3 tier of kelsons in the centre, with sister kelsons, 15 by 16 inches square; three streaks of bilge kelsons on each side, 17, 16 and 15 inches deep, by 15 inches wide, and has over 6 tons of iron fastenings on them; from the kelsons in the turn of the bilge there are 5 streaks of 8 inches thick, and 7 inches to the lower deck; 2 bolts in each streak, in every timber; her deck and hanging knees are all of Maryland and Virginia white oak; deck breast hooks, live oak; the 6 other hooks are of white oak, and are remarkable for their size, and the quantity of fastenings in each; her deck beams are larger than in any ship of her size ever built in this city; she has, besides her entire stanchions, a tier of bilge stanchions, running from her upper deck to the bilge streaks, and strapped and bolted to the beams and kelsons. She has two bolts in each floor, fore and aft. She has a round stern, and is 1,294 tons register.

The Arctic, packet ship, was launched in August, and cleared on the 23d ult. for Liverpool.—She belongs to A. Zerega's line, and is commanded by Capt. Zerega. The *Arctic* measures 1,380 tons, and is 180 feet long, 40 beam and 23 hold.

She is a fine vessel, and all her apartments are liberal and judicious.

The San Francisco, now on the stocks, is a steamship of 2,000 tons, for Howard & Son's Pacific Line, intended to run on the western side. She is 230 feet long, 40 beam and 24 deep, and will be one of the strongest steamers yet built. Her frame is of live oak, fastened with diagonal braces in the most substantial manner. Her two engines will be built at the Morgan Works.

The Brother Jonathan, a steamship of 1,000 tons, also for Howard and Son, is nearly ready to be launched. She will be 220 feet long, 35 wide and 14 deep, and is designed for river navigation. The engine formerly in the Sound steamer *Atlantic* will be taken: it has not been used since taken from the *Atlantic*, and will be a very powerful machine in a ship of the size intended.

The Hornet, a propeller, of 1,150 tons, is under way, for Capt. Stoddard. Her dimensions are:—Length, 210 feet; beam, 32; hold, 26. She is intended to make excellent time; her propeller is 14 feet in diameter. Hogg and Delameter are building the engines, 50 inch cylinder and 44 inch stroke.

A Clipper Ship keel is laid. She will be 800 tons burden; 160 feet long, 35 wide and 19 hold, built of the best materials and intended for speed. She is owned by Messrs. Siffkin and Ironside.—This makes the eighth vessel built in this yard this year.

JABEZ WILLIAMS & CO.

A Clipper Ship is under way for Thomas Wardle & Sons, intended for the Pacific trade, and to be commanded by Capt. Hamilton, late of the South Carolina, an experienced officer. The ship is to be heavily sparred, and furnished throughout with Waterman's Patent Blocks. The tonnage is 1,340 tons. Dimensions as follows:—200 feet on deck; 194 feet keel; 37 feet beam, molded; 21 feet 6 inches depth of hold; main kelsons, 7 feet through, by 15 inches width, with sister kelsons, 9 feet by 15 inches. 1½ copper floor bolts every 28 inches. Dead woods at each end, are live oak, fastened with 1½ copper bolts. Live oak top throughout.

The Great Explosion at Seaford.

Great excitement was caused at Seaford, on Thursday, that being the day when an explosion of a part of the cliff took place, as had been previously announced. Seaford is twelve miles from Brighton and about five from Beachy Head. The sea having gradually encroached upon the land, it was determined to throw down a part of the cliff, so as to form a barrier against its future ravages. For this purpose, 55 of the Royal Sappers and Miners have been engaged for the last seven weeks making the necessary preparations.

The cliff was perforated in various places with tunnels and shafts, and in each of two chambers excavated for the purpose of a charge of 12,000 lbs. of gunpowder was deposited. By 3 o'clock, the hour fixed for the explosion, about 10,000 people had assembled, and means were taken to keep them at a proper distance beyond the reach of danger.—The gunpowder being fired by voltaic batteries at twelve minutes past 3, suddenly the whole cliff, along a width or frontage of some 120 feet bent forward towards the sea, cracked in every direction, crumbled into pieces, and fell upon the beach in front of it, forming a bank, down which large portions of the falling mass glided slowly into the sea for several yards like a stream of lava flowing into the water.

The whole multitude upon the beach seemed for a few moments paralyzed and awe struck by the strange movement, and the slightly trembling ground. There was no very loud report; the rumbling noise was probably not heard a mile off, and was perhaps caused by the splitting of the cliff and fall of the fragments. There seemed to be no smoke, but there was a tremendous shower of dust. Those who were in boats a little way out, state that they felt a slight shock. It was much stronger on the top of the cliff. Persons standing there felt staggered by the shaking of the ground, and one of the batteries was thrown down by it. In Seaford, too, three quarters of a mile off, glasses upon the table were shaken, and one chimney fell. At New-

haven, a distance of three miles, the shock was sensibly felt.

In a few moments after the cliff had fallen the crowd upon the beach rushed forward to it. A second fall of chalk, when they had got halfway, checked them for an instant, and but for an instant. They rushed up the mound which the exploded chalk had formed. Although it is a mass of large rough stones for the most part difficult in many places to climb, except by using one's hands as well as feet, yet ladies eagerly clambered up it, and one gentleman managed to get his horse up. The mass which came down is larger than was expected; it forms an irregular heap, apparently about 300 feet broad, of a height varying from 40 to 100 feet, and extending 200 or 250 feet more seaward, which is considerably beyond low water mark. It is thought that it comprises nearly 300,000 tons. The operation is considered to have been decidedly successful.—*English paper.*

Maryland.

Business of the Baltimore and Ohio Railroad.—The following are memoranda of the business upon the Baltimore and Ohio railroad, for the month of September, 1850.

The transportation eastwardly into the city of Baltimore, of some of the principal staples has been as follows:

Bark.....	24 tons	Lime.....	8 tons
Coal.....	13,393 "	Live stock viz:	
Fire brick.....	112 "	7,325 hogs.....	519 "
Firewood.....	15 "	420 sheep.....	28 "
Flour.....	40,155 "	210 horses and	
		mules.....	92 "
Grain.....	52 "	42 Horn'd cat..	18 "
Granite.....	411 "	M'l. & shorts.....	227 "
Iron.....	555 "	Pork & bacon.....	61 "
Iron ore and		Tobacco.....	142 hds.
manganese.....	88 "	Whiskey.....	408 bbls.
Lard and but-		Miscellaneous.....	253 tons
ter.....	17 "		
Leather.....	94 "		

The revenue for the month has been as follows:

	For Passengers.	For Freight.
Main stem.....	\$33,637 35	\$94,355 00
Washington branch.....	24 300 50	11,921 68
	\$57,937 40	\$106,276 68

Making an aggregate of \$127,792 35 on the main stem, and \$36,221 73 on the Washington branch—the total being \$164,214 08.

The above shows an increase over the corresponding month of last year of \$16,258 15, being \$8,126 92 on the main stem, and \$8,131 23 on the Washington branch.—*Patriot.*

Atlantic and Pacific Railroad.

Our readers will recollect, that some years ago the indefatigable Mr. Whitney, set on foot a grand project of connecting the Atlantic with the Pacific by railway, to commence at the west end of Lake Michigan, to be constructed by means of a sixty miles strip of public lands, to be conveyed to Mr. Whitney at a nominal price for that purpose. Conventions of delegates on the same subject were held last fall at Memphis and St. Louis, and this spring at Philadelphia. During the recent session of Congress committees reported favorably on the plan of Mr. Whitney. From all these proceedings we see that it is now conceded on all hands, that it is expedient, necessary and practicable, to construct the work, but that the great difficulty in the way is the means; how are they to be raised?—Some of the friends of the plan of constructing the work by the government, say that the whole of the public lands should be appropriated, and if they should not be sufficient to construct the work, supply the deficiency by an issue of stocks, and private subscriptions. The friends of the Whitney plan object to this, and seem to think that Mr. Whitney can construct the work out of the proceeds of a strip

of thirty miles of public lands on each side of the road. It seems to us, with all due deference to the opinion of others, that the means have not yet been found to construct this gigantic work, costing by estimate not less than one hundred millions of dollars. Applying the whole nett proceeds of the public lands, as fast as sales can be made, it would take nearly thirty years to make the work, and allowing one third as much for the proceeds of a strip thirty miles wide, it would require about ninety years, supposing that no repairs were needed in the meantime. We would gladly see the work constructed, and we feel confident that some plan will yet be devised and carried out for the accomplishment of an end that all seem to desire, still in the meantime a railroad is gradually progressing west by private companies, to the mouth of the Kansas river, the point at which it was proposed at the St. Louis convention, the main trunk line should commence. When the branches shall reach this point, so many interests will combine to extend the line, that the means will be found either by the government, or private companies, with, or without the aid of the government. A work so necessary and important can never rest until it is constructed.—*Ind. State Sentinel.*

Massachusetts.

The following account of the receipts and expenses of the Boston and Worcester railroad is from official sources:—

Receipts from 1st Dec. to 1st Sept., 9 months.....	514,786.56
Expenses.....	262,528.92
	252 257.64
Reserved income.....	8,404.68
	260,662.32
Dividend 1st June, 3 per cent.....	135,000.00
Interest account.....	13,699.28

Balance income account 1st Sept., '49.....\$111,963.04

The earnings for the nine months, exceed those of last year to the same date, \$46,862.26. The increase in September was \$4,605.04, making total increase to October, 1st, \$51,467.20. The entire increase has been in passenger receipts, making a gain of seventeen per cent. The January dividend will not be so large as the Western railroad's; but if these two lines could be united in one corporation, the saving in expenses, under a single management, would make the united line a safe and sure eight per cent. stock, which would doubtless command in the market as good as those paid for the Lowell and Fitchburg.—*Bos. Cour.*

Maine.

Kennebec and Portland Railroad.—The annual meeting of the stockholders of the Kennebec and Portland railroad company was held in Bath on Thursday, October 3d. Hon. D. C. Magoun of Bath, was elected chairman. The annual report of the president of the company was then read, and two thousand copies voted to be printed. The report states that an arrangement has been made with Mr. Marsh, the former contractor, to finish the road to Augusta on terms more favorable to the company, than those stated in the legislative report which was the basis on which the towns voted to loan their credit. According to the new contract the whole road is to be completed to Augusta by the 1st day of September next.

The following persons were elected directors for the ensuing year:

Reuel Williams, Augusta; George F. Patton, Bath; Wm. B. Sewall, Bath; John D. Lang, Vas-

salboro'; Joseph M'Keen, Brunswick; Marshall S. Hagar, Richmond; Thomas W. Smith, Augusta; George W. Stanley, Augusta; Wm. B. Grant, Gardiner; Henry Reed, Hallowell; Parker Sheldon, Gardener.

Wm. B. Brooks, of Augusta, was chosen Loan Commissioner, on the part of the towns.

A vote of thanks was unanimously and enthusiastically passed, to the president and directors, for their judicious and untiring efforts to promote the interests of the company. The utmost harmony and unanimity prevailed, and the meeting dissolved in the best state of feeling, inspired by the favorable prospect of the speedy completion and ultimate profitability of the Kennebec and Portland railroad.

How it Works.

We understand that the Amory Iron Works of this city, and the Manakin Iron Works, about 12 miles distant, have both put out their fires and discharged their workmen; waiting some change in the existing policy of the government, which would enable them to resume operations without the certainty of loss. These events are much to be lamented, as hundreds of industrious operatives and their families, dependent on these establishments, are thus deprived of employment, and thrown upon the charity of the world for their daily support.

No man, not familiar with the operations of a rolling mill, can form an adequate idea of the amount of material and labor required to carry it on; and the stoppage of such an establishment is a serious calamity and public loss. We understand that the Amory rolling mill worked up annually 4000 tons of pig iron, and consumed about 200,000 bushels of coal. Estimate the number of hands required in the production of this iron and coal—the number necessary to transport it to market—the number needed to manufacture the iron, and the agricultural labor required to feed the various operatives, and some idea may be formed of the advantages resulting to the community from iron manufactures.—*Richmond Whig.*

New York.

Rochester and Syracuse Railroad.—At a meeting of the stockholders of this company held recently at Canandaigua, the following gentlemen were elected directors:

H. B. Gibson, J. B. Varnum, J. J. Vanalen, Jno. Wilkinson, John H. Chedell, Nathaniel Thayer, W. F. Weld, Horace White, Jacob Gould, E. Darwin Smith, Joseph Fellows, Charles Seymour, R. H. Ives.

At a subsequent meeting of the directors, H. B. Gibson was chosen president, Charles Seymour secretary and treasurer, and Charles Dutton superintendent.

Railroad Superintendent.—Charlton Dutton, for several years the efficient superintendent of the Tonawanda railroad, has been appointed superintendent of the Rochester and Syracuse road. Mr. D. is a gentleman of great energy of character and untiring industry. He will discharge his duties acceptably.

Ohio.

We are happy to announce that Judge Lane has returned from the east, having succeeded beyond his expectations in negotiating for the road. He has also secured the right of the Ohio railroad company from Sandusky to Toledo. This places the construction of the road to Toledo beyond question. Mr. Morton, the resident Engineer, is now examining the estimates and will be ready to report early this week. The road will then be put

under contract, and the work immediately commenced. The route is very favorable, the estimates being nearly \$5,000 per mile less than the Norwalk route.—*Elyria Cour.*

AMERICAN RAILROAD JOURNAL.

Saturday, October 12, 1850.

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Importance of Railroads and Manufactures to the South.

Thus far the south may be said to have devoted herself to one interest, agriculture. Although other branches of industry have been followed to some extent, the former is the great absorbing pursuit of that portion of the Union. The consequences of this are daily becoming more and more marked.—Experience has fully proved that so long as we have an abundance of unoccupied territory, the population of the agricultural districts, in every part of the country, after it reaches a certain limit, remains nearly stationary; the increase finding it more for their interest to go to the new lands, which are cheap and fertile, than to remain where cultivation and population has given them a high value. The agricultural towns in Massachusetts, the most rapid growing of the old States, have increased but a very little for thirty years past. Western New York, the most fertile portion of this great State, will show but a slight growth since 1840; not so much by any means as the eastern portion. The same law of population is observable in every portion of the country. The north, in addition to agriculture, is extensively engaged in commerce and manufactures. She possesses elements of growth here that the south has not availed herself of. The increase of population in the Eastern and Middle States is almost entirely owing to their progress in these branches of industry.

The growth of manufacturing establishments, as a natural consequence, stimulated the construction of means of transportation, and these, by opening access to the natural resources of the country, its water power, coal, iron ores, etc., etc., operated powerfully to the development of these resources. Manufacturing and the construction of works to cheapen transportation have gone hand in hand; the latter being absolutely essential to success in the former pursuits.

In the above remarks we find in part the explanation of the greater density, and more rapid increase of population, in the Northern than the Southern States. The latter, taking only such territory as is actually settled, presents the greatest area. It certainly possesses greater capacities for a more dense population, and the reason why it does not number more inhabitants is because only one of those elements is made the basis to sustain them.

Now one of the rights which the south insists upon, is, that she shall be permitted to continue to exert in the administration of affairs the relative influence which she has thus far maintained in the government of the country; in other words, that each portion of the country shall continue to exert its moiety of influence. Without going into any discussion as to the merits of the claims advanced on either side, it is certainly very proper to call the attention of what, at present threatens to become the weaker party to the means by which alone the equilibrium can be maintained.

In this country public opinion must ever be the germ of law. It becomes law as soon as it can be ascertained and defined. Now public opinion is the conviction and will of the majority; and that the majority are entitled to make laws which shall promote the interests of the greatest number, is not only agreeable to the form of our government, but to natural equity. The rights secured to the minority by the constitutional guaranties, and by the law of natural right, should be respected, but where these are not violated, the will of the majority is, and should be paramount.

There are many laws coming within the scope of our national legislature which may favor one portion of the country more than another. The South believes that the North frequently enact such by virtue of numbers alone. If this is admitted, what is the remedy? for the exercise of this prerogative may be a right which cannot be disputed. It is simply this: the South must increase her numbers. Here is her true and a certain remedy. She possesses most fully the means to apply this cure.

She has ample territory. She has the superiority in climate and soil. In her magnificent rivers she possesses superior natural facilities for transportation. She can construct railroads, the greatest source of northern progress, for one quarter their cost in the North. She is far superior to the North in the extent and richness of her mineral deposits. She possesses in a greater degree all the elements which form the basis of a dense population, consequently of political influence. If she has lost some portion of this influence, she still possesses the capacity of regaining it. The policy for her to pursue is a plain one. She must turn her natural advantages to the best account. If New England grows by virtue of cotton spinning, she must spin too. If Pennsylvania gains rapidly by working her coal and iron, she must not suffer her coal and iron to lie idle in the ground. Any disparity which is the result of superior enterprise is no cause of complaint, though it may bring with it inconveniences to one party. It is the natural reward of superior industry and activity, and instead of being a cause of dissatisfaction, should only serve to stimulate to increased efforts. Every act of life has its appropriate results, which are inevitable. We must not complain of results, so long as the cause is in our power.

The steps necessary to restore this equilibrium, we are glad to see are now being taken by the South

in earnest. The subject of the development of the resources of that part of the Union, are now engrossing the attention of its people. Railroads, the pioneers of all other improvements, are projected in every quarter, and many of them are in progress. Wherever they run by a water fall, an iron or coal mine, some one will be sure to be found who will be ready to turn all these to account. The improvement of these sources of wealth will react upon agriculture. A market will thus be opened for a very large amount of products, which may be made the basis to support a home population, but which cannot be exported. The South then can raise something to sell besides cotton. Farming to some extent will then take the place of planting. The agricultural sections will fill up. A mutual demand will grow up between all classes for the respective products of each; in fine, we see at the South the same state of things which we witness in every community whose industry is devoted to different objects.

So much for restoring an equilibrium based upon equality of numbers. Similarity of pursuits, while they will secure what may be termed physical equality, will create at the same time a much stronger bond of union, similarity of interests and ideas. Under this influence local distinctions will be forgotten. The words North and South, East and West, will cease to stand for terms representing different parts or interests. Every part of the country will occupy an equal place in each person's affections.

Let us all do our utmost to promote that state of things which shall not only be productive of the greatest material good to all, but which at the same time shall work an effectual cure for the political ills which threaten.

Important Patent Decision.—India Rubber Springs for Railroad Cars.

The Commissioner of Patents has lately decided that F. M. Ray, of this city, is the inventor of the application of India-rubber to the use of car springs. The claimants for the patent were W. C. Fuller, of England, and Mr. Ray. All the springs in use have been made by parties representing the above persons, and the great and rapidly increasing use of India-rubber for springs, rendered the decision of the Commissioner of Patents, settling the rights of the claimants, a matter of great importance to those interested.

Annexed is a copy of the official certificate from the Commissioner of Patents:

COPY.

U. S. PATENT OFFICE, WASHINGTON, D. C.,
12th September, 1850.

Sir—You are hereby informed that in the case of the interference between your claims and those of W. C. Fuller, upon which a hearing was appointed to take place on the second Monday in August, the question of priority of invention has been decided in your favor. I enclose a copy of the decision.

The testimony in the case is now open to the inspection of those concerned.

Yours respectfully,

Signed DELLITT C. LAWRENCE,
Acting Commissioner of Patents.

To Mr. Fowler M. Ray.

Illinois.

The traffic of the Galena and Chicago road, which extends into the prairies some forty miles to Elgin, shows a highly satisfactory result. In September the receipts were \$14,038 95, against \$4,267 43, showing an increase of \$9,791. The business of the nine months to 1st October was \$73,706 82.

DeBow's Review of the Southern and Western States.

We have received the October number of this valuable periodical, which is mainly devoted to the promotion of the interests of the Southern and Western portion of the country. In addition to its general literary merits, it is very valuable for the full statistical information which it gives of Southern industry and progress. These statistics are collected with great care and industry; and the work presents more useful information in relation to the great staples of the South, than can be found in any other periodical. As these staples form the basis of a great part of all our leading commercial transactions, the above work is an indispensable part of every business man's library.

To the South it is calculated to be of great advantage in elucidating her interests, in pointing out her resources, and in aiding in their development, in recording her progress, and in the influence which the information which is collected will exert in directing and guiding her industry. We are happy to bear testimony to its high literary merits, and to the accuracy of its statistical information, and are happy to learn that it is enjoying a liberal patronage.

The editor and proprietor of this work is now in this city on business connected with it, and will be happy to receive subscriptions to the same. He has a few sets of the entire work still remaining, which will be delivered in any of the large cities or towns, without any expense to the person ordering, viz: in Boston, New York, Philadelphia, Baltimore, Richmond, Charleston, Mobile, Savannah, Vicksburg, Memphis, St. Louis, Cincinnati, etc. Subscription Price, \$5.

Pretty Good Business.

The Reading railroad is now carrying at the rate of about 130,000 tons of coal per month. This, at \$1 65 per ton, gives a monthly revenue from coal alone of \$214,500, equal to \$2,794,000 for the year. We believe, after all, that the recent freshet in Pennsylvania, which has proved so destructive to some of her works, will prove a God-send in the end. It has brought up the price of coal to a high point, and we should not be surprised if a long time elapsed before it settled again to its former rate.—The present advances maintained will soon amount to the loss sustained, and it may be kept up in part after all the means for transporting coal are again in operation.

Flat Bar Rail.

Our readers will find under our advertising head a quantity of flat bar Iron for sale. The notice is well worth the attention of those who are using this kind of rail.

Pennsylvania.

The Coal Trade.—We stated two weeks since, that it was possible for the Beaver Meadow, Hazleton and other collieries depending upon the Beaver Meadow railroad for their outlet to navigation, to ship in the aggregate about 60,000 tons if the Beaver Meadow railroad was repaired so as to give them five weeks of shipments.

The repair of the road has for some cause been delayed, and it will now be impossible to put it in order, so as to do business upon it, before the close of the season. No more coal will be shipped from the collieries above named this season.

The only collieries which will be in operation the balance of the season, are the Lehigh or Summit mines, Nesquehoning and Buck Mountain.—*Carbon Co. Gaz.*

New and Important Discovery in the Manufacture of Iron.

The Pittsburgh Post has a letter giving an account of a discovery made by a young man by the name of Adams, the assistant manager of the Brady's Bend Iron Works, in Clarion county, in the manufacture of railroad and merchant bars from coke metal. By the old method the rails were made with charcoal pig; and would crack very much and break with one or two blows. By Adams' process iron can be made from eight to ten dollars per ton lower, and of a superior quality.—The process is not mentioned, but the quality of the iron produced is spoken of. The writer of the letter was shown a rail that had been put to the severest test, by putting it, while hot, into cold water—after which they tried to break it with a sledge hammer weighing 80 pounds. Forty blows were given by six men alternately, and they could not even crack it. The charcoal iron of the company costs from 18 to 22 dollars per ton, their "coke metal" costs only from 9 to 11 dollars per ton.

Maine.

We learn that John Russell, Esq., the intelligent and judicious superintendent of the Portland, Saco and Portsmouth railroad, has received the appointment and accepted it, of superintendent and agent of the Kennebec and Portland railroad. Probably a more judicious and excellent appointment, under the circumstances, could not have been made, and a more judicious measure could not have been adopted by the directors. Mr. Russell is a well-informed, practical man, with all the knowledge of geometrical and mechanical principles, that such a situation calls for; and if there now exist irregularity, confusion, or want of system, he will very soon reduce things to order.

New Hampshire.

New Hampshire Central Railroad.—At the annual meeting of the New Hampshire Central railroad company, held at East Weare, on Thursday, 3d inst., the following gentlemen were elected directors for the ensuing year:—David Steele, of Goffstown, Edward Crane, of Boston, Moses Sawyer, of Weare, Moses A. Hodgden, of Weare, John T. Cahill, of Worcester, L. Smith, of Henniker, Abner Hoyt, of Goffstown.

Indiana.**Madison and Indianapolis Railroad.**

The receipts of this road for September, 1850, were \$23,895 08
Ditto for 1849 16,946 41

Increase \$6,948 69

A gentleman connected with this road writes us under date of Oct. 2d, that:—"The Knightstown road will be opened to Carthage, 12 miles, in all, next week, and the Bellefontaine will be opened to Pendleton, 26 miles, on Tuesday next." The above roads will add very largely to the business of the Madison and Indianapolis.

Tennessee.

East Tennessee and Georgia Railroad.—A model of the rail to be used on the East Tennessee and Georgia railroad has been left at our office, where such as desire to do so may examine it. Competent judges pronounce it an excellent rail.

We are pleased to learn that the present efficient engineer of the road is "winning golden opinions," for the manner in which he is conducting the work under his charge. The work on the road is progressing rapidly, and the section between Dalton and the Hiwassee will be ready for laying down the rails in a short time.—*Knoxville Register.*

FOR SALE.

THREE LOCOMOTIVES, Manufactured by M. W. Baldwin, of 10 tons weight, all in complete repair, and now running on the Columbia and Philadelphia Railroad.

For particulars apply to A. L. Roumfort, Supt. of said road, either at Philadelphia, or Parkersburg, Chester county.
A. L. ROUMFORT,
Supt. Motive Power Col. & Philad. R.R.

NOTICE.

A MEETING of the Stockholders of the Tonawanda Railroad Company, will be held at the Railroad Hotel, in the village of Attica, in the county of Wyoming, on the 18th day or November next, at 12 o'clock, at noon, for the purpose of passing upon the ratification of an agreement for the consolidation of the Tonawanda Railroad Company and the Attica and Buffalo Railroad Company, into a single corporation, made by the directors of the said two corporations, and to be submitted to said meeting. Dated October 8, 1850. F. WHITTLESEY, Sec'y.

To Railroad Companies, Machinists, Car Manufacturers, etc., etc.

CHARLES T. GILBERT,
NO. 80 BROAD ST., NEW YORK,

Is prepared to contract for furnishing at manufacturer's prices—

Railroad iron,
Locomotive Engines,
Passenger and Freight Cars,
Car Wheels and Axles,
Chairs and Spikes.

Orders are invited; and all inquiries in relation to any of the above articles will receive immediate attention

American Railway Guide, AND POCKET COMPANION FOR THE UNITED STATES;

CONTAINING Correct Tables, showing the time for starting of trains from all stations, distances, fares, etc., on all the Railway lines in the U. States; also many of the principal Steamboat and Stage routes—accompanied by a complete RAILWAY MAP. Price, single copies 12½ cts., or \$1 per annum. Published on the first of every month, corrected from returns furnished by the Railway Superintendents throughout the Union.

This book has been compiled somewhat on the plan of Bradshaw's Guide, with such improvements in size, form and arrangement as have seemed desirable; and the publisher confidently hopes it will not be found liable to the objections of incompleteness and incorrectness, which have been made, and justly too, against various other similar works heretofore issued.

The subscriber having had the management of the NEW YORK PATHFINDER almost from its commencement, has enjoyed superior facilities in obtaining information relating to the thoroughfares of travel, and is therefore well qualified to prosecute with success the arduous undertaking of furnishing a complete and correct national guide book.

STRINGER & TOWNSEND, General Agents, 222 Broadway: and sold also by Booksellers and Periodical Dealers generally throughout the country; also on all the Railways and Steamboats.

CURRAN DINSMORE, Publisher.

N. Y. Pathfinder Office,
138 Fulton St., New York City.

United States Railroad Guide and Steamboat Journal.

CONTAINING OFFICIAL TIME ADVERTISEMENTS, Tables of Stations, Distances, Fares, Time, etc., with much miscellaneous matter for the travelling public. Price 12 cents a copy. Yearly subscription \$1. Published at 43 Ann street, New York.



EMERSON'S
PATENT
CORRESPONDING
VENTILATORS,

For Ships, Steamers, etc.,

Manufactured by

CHILSON, ALLEN, WALKER & CO.,
351 Broadway, New York.



NOTICE

For Proposals for Railroad Iron, for the Alabama and Tennessee River Railroad,

TO BE MANUFACTURED FROM ALABAMA ORE.

THE Alabama and Tennessee River Railroad Co. invite proposals, until the 1st of January, 1851, for Iron Rails, to be made of Alabama Iron, for the Northern Division and part of the Southern Division of their road, embracing a distance of about 105 miles. The rails are to be of the H pattern, in lengths of 18 feet, and weighing 63 lbs. per lineal yard. They are to be delivered on the Coosa river, at a landing to be hereafter designated, between Kimulgee ferry and Fort Williams, commencing their delivery on the 1st of November, 1851, and continuing it at the rate of from 80 to 100 tons per week, until the whole quantity required (10,500 tons) shall have been delivered. They are to be inspected by Lewis Troost, Chief Engineer.

It is proper to state to iron masters and capitalists at a distance, that the country traversed by the Northern and part of the Southern divisions of the road abounds in excellent iron ore and bituminous coal, and possesses every advantage for the successful manufacture of iron, health, cheap labor and provisions.

Further information may be obtained by addressing the President of the Company at Selma, Ala. By order of the Board of Directors.

J. W. LAPSLEY, President.

STATE OF NEW YORK.

SECRETARY'S OFFICE, ALBANY, AUGUST 15, 1850.—To the Sheriff of the City and County of New York:—Sir, Notice is hereby given that at the General Election to be held in this State on the Tuesday succeeding the first Monday of November next, the following officers are to be elected, to wit:—A Governor in the place of Hamilton Fish; a Lieutenant Governor in place of George W. Patterson; a Canal Commissioner in place of Jacob Hinds; an Inspector of State Prisons in place of David D. Spencer; a Clerk of the Court of Appeals in place of Charles S. Benton; a Representative in the 32 Congress of the United States, for the 3d, 4th, 5th and 6th Districts, in place of J. Phillips Peeney, Walter Underhill, George Briggs and James Brooks. County Officers to be elected for said county: sixteen Members of Assembly; a District Attorney in place of John McKeon. All of whose terms of office will expire on the last day of December next. And also a City Judge, in pursuance of charter 206, laws of 1850. [The electors throughout the State are also to vote for or against the repeal of the act entitled "An act establishing Free Schools throughout the State," passed March 26, 1849, and an act entitled "An act to amend the act entitled an act establishing Free Schools throughout the State, passed April 11, 1849.]

Yours respectfully,
CHRISTOPHER MORGAN,
Secretary of State.

Sheriff's Office, Aug. 20, 1850.

I hereby certify that that the above is a correct copy of the notice of the General Election to be held on Tuesday succeeding the first Monday of November next, received this day from the Hon. Christopher Morgan, Secretary of State.

THOMAS CARNLEY,
Sheriff of the City and County of N. York.

N. B. All the public newspapers within this county will please publish this notice once in each week until the election, and send in their bills for advertising the same as soon as the election is over, so that they may be laid before the Board of Supervisors and passed for payment.

Nashua Iron Co.,

NASHUA, NEW HAMPSHIRE.

MANUFACTURERS of Bowling, Pembroke and Lowmoor Locomotive Tires, Engine Frames, Crank and Car Axles, Wrought Iron Shifting of all sizes, Shapes of all descriptions used in Machine shops and upon Railways.

FRANKLIN MONROE, Treasurer.

Messrs. Fullerton & Raymond, Agents, Boston.

" Raymond & Fullerton, " New York.

Orders received by the Treasurer at Nashua, N.H., or by the Agents in Boston or New York.

Emerson's Patent Ventilator,

ADAPTED to Cars, Engine houses, Public Halls, Factories, Churches, School Houses, Dwellings, Chimney Flues, etc.



3,000 of the article.

CHILSON, ALLEN, WALKER & Co.,
351 Broadway, New York.

This Ventilator is stationary, and cannot get out of order. It is constructed in such conformity to certain ascertained laws of pneumatics, as to insure a constant draft outward, whatever may be the changing direction of the wind. The Massachusetts Mechanic Association have awarded a gold medal to the Inventor, and the Manufacturers have already disposed of over

To Civil Engineers.

WANTED—A Practical Engineer, to be concerned in an Enterprise (a valuable Cannel Coal Mine) that will prove of great advantage to him, as well as those to be associated with him. A preference will be given to one possessing some means, to aid in the completion of the works now in progress, and to take an interest in the stock of the company, already incorporated. Communications addressed to B.G.L. at this office, with real name and address, will meet with immediate attention.

October 3, 1850.

4140

Great Work on Bridge Building, etc., etc.

JUST published in medium folio, One Dollar, 75 cts. to subscribers.

Part II of a "THEORETICAL AND PRACTICAL TREATISE ON THE CONSTRUCTION OF BRIDGES IN STONE, IRON AND WOOD," including the Equilibrium of Arches, the mathematical principles of the Oblique Arch, Suspension Arch, etc., Construction of Foundations in Water, Centering, Oblique Arches, etc., the application of Iron to Railroad Structures, Practical Tunnelling, Suspension Bridges, etc.; illustrated by numerous accurately executed Plans, Elevations, Sections and Details of Stone, Iron and Wood Bridges, Viaducts, Tunnels, Culverts, Machines, etc., constructed by the most eminent Architects and Engineers in Europe and the United States, and numerous Original Designs for Bridges, Viaducts, Culverts, etc. The whole calculated to meet the exigencies of Engineers, and assist Draughtsmen, Bridge Builders, Mechanics and Students. By George Duggan, Architect and Civil Engineer.

The present part contains beautifully executed plans, elevations, sections, and details of the Cast Iron Oblique Arch, 100 feet span, constructed on the system of M. Polonceau, over the Canal St. Denis, Gt. Northern R.R. of France, also plans, elevations, sections and details of a Timber and Iron Truss, 74 feet span, from St. Mary's Viaduct, Cheltenham and Great Western R.R., England, and a Wrought Iron Girder Bridge, 120 feet span, constructed for the London and Blackwall R.R., with the conclusion of the introductory article on the relative merits of the various forms of construction adopted, and materials employed, as regards economy, strength and durability.

Published by George Duggan, 300 Broadway, New York, to whom all communications should be addressed and subscriptions forwarded.

Parties remitting Mr. Duggan \$5. and the remainder \$4 when they have been supplied with the first six parts of the "Theoretical and Practical Treatise on Bridge Building, etc." shall receive it monthly as published. To those making Mr. Duggan a present remittance of \$9, the work will be forwarded post free to any part of the United States.

Railroad Iron.

THE Undersigned are prepared to contract for the delivery of superior make Welsh Railroad Iron of the favorite brand "Aberdare."

JOSEPH BRAMWELL & CO.,

40 91 Wall street.

American Cast Steel.

THE ADIRONDAC STEEL MANUFACTURING CO. is now producing, from American iron, at their works at Jersey City, N.J., Cast Steel of extraordinary quality, and is prepared to supply orders for the same at prices below that of the imported article of like quality. Consumers will find it to their interest to give this a trial. Orders for all sizes of hammered cast steel, directed as above, will meet with prompt attention.

May 23, 1849,

Bowling Tire Bars.

40 Best Flange Bars 5 1/2 x 2 inches, 11 feet long.
40 " " 5 1/2 x 2 " 7 feet 8 in. long.
40 " Flat " 6 x 2 " 11 feet long.
40 " " 6 x 2 " 7 feet 8 in. long.

Now in store and for sale by

RAYMOND & FULLERTON,
45 Cliff street.

Notice to Contractors.

CENTRAL OHIO RAILROAD.

SEALED PROPOSALS for the Graduation and Masonry of 36 miles of the Central Ohio Railroad, extending from the 24th section—three miles east of Newark to the City of Columbus—will be received until the 1st day of November next.

Also for the Bridging (being about 1200 lineal ft.) for the whole line from Zanesville to Columbus.

Also, for 55,000 White Oak Cross Ties, deliverable along the line from Zanesville to Newark before the first day of May, 1851.

Also, for 72,000 White Oak Cross Ties, deliverable along the line from Newark to Columbus before the 1st of August, 1851.

Contractors proposing for the construction of Bridges may propose for plans furnished by themselves, as well as those furnished by the Engineer.

The line will be ready for examination by the 10th of next month (October.)

The bids will be received at the office of the Engineer in Newark, where plans will be exhibited, and specifications furnished.

Contractors unknown to the undersigned must produce satisfactory testimonials.

The amount of work involved in this letting is well worthy the attention of enterprising contractors.

By order of the Board.

ROBERT MAC LEOD Chief Engineer.

Zanesville, Sept. 24, 1850.

P.S. A large number of laborers would find immediate employment and fair wages upon the portion of the line now under contract.

To Contractors.

ALABAMA AND TENNESSEE RIVER R. R. SEALED Proposals will be received by the Directors of the Alabama and Tennessee River Railroad, at their office in Selma, until the 1st of November next, for the graduation, masonry and bridging of 56 miles of the Southern Division of said road, extending northwardly from Selma.

Plans and profiles may be inspected and specifications and information will be given at the office of the company in Selma, on and after the 15th of October next.

Twenty-six miles of this division were graded in 1839. This part of the division will require repairs to the road bed, and will be furnished anew with culverts and bridges.

The country embraced in this division is healthy, well watered, and possesses facilities for obtaining supplies of provisions.

Proposals may be based upon cash payments, or upon payments of a proportion, or of the whole of the work in stock.

The Directors reserve to themselves the right to accept or reject proposals as they may think proper for the interests of the company.

The Directors expect to have as much as twenty miles of the Northern Division, extending northwardly from the Coosa river in Shelby county, ready for examination by the 15th November, and for letting by the 1st December; and 30 miles more, ready for examination by the 1st and for letting by the 15th of January, 1851. It is likewise their intention to let out the grading, masonry and bridging of the remainder of the Southern Division and of the Northern Division terminating at Gadsden, with all possible despatch.

By order of the President and Directors.

LEWIS TROOST, Chief Engineer
Selma, Ala., August 30, 1850.

Rosendale Cement.

THE NEWARK AND ROSENDALE LIME AND CEMENT CO. are now manufacturing at their works in NEWARK, N. J., and Ulster county, N.Y., a very superior article of Hydraulic Cement—also Lime Calcine Plaster, etc. Contractors and dealers will find it to their advantage to call or make application before purchasing elsewhere. All communications addressed to the subscriber, at Newark, N.J., will be punctually attended to.

17*18

HENRY WILDE, Secretary.

Faggotted Car and Engine Axles

FORGED by RANSTEAD, DEARBORN & Co., Boston, Mass.
These Axles enjoy the highest reputation for excellence, and are all warranted.

Ogden & Martin's ROSENDALE CEMENT.

WE are prepared to enter into arrangements for supplying our Cement for public works or other purposes. We warrant the cement equal in every respect to any manufactured in this country. It attains a great degree of hardness, sets immediately under water, and is a superior article for masonry coming in contact with water, or requiring great strength.

For sale in tight barrels, well papered, at their office by **OGDEN & MARTIN**, 104 Wall st. 1y*
February 16, 1850.
The above cement is used in most of the fortifications building by government.

Railroad and Mathematical Instruments.

KUNS & BASELER, Mathematical Instrument makers, manufacture and keep for sale all kinds of mathematical instruments; also drawing instruments, scales and balances for the use of chemists, professional gentlemen, jewellers, etc., etc., of the most perfect description, at the lowest price, at 81 Nassau street, New York.

Ibbotson, Brothers & Co's CELEBRATED CAST STEEL

AND
Best Cast Steel Royal Improved Files, well known as better adapted for Engineers' and Machinists' purposes than any now in use in the United States.

Every description of Square, Octagon, Flat and Round Cast Steel, Sheet, Shovel and Railway Spring Steel, etc., and Steel to order for any purposes—manufactured at their works in Sheffield—and universally known by the old stamp "Globe."

HENRY I. IBBOTSON, Agent,
218 Pearl st., New York.

Railroad Iron.

OF ANY PATTERN AND WEIGHT,
Of a Favorite Brand,
And deliverable in Bond, or Duty paid, at any Port of the U. S., contracted for on favorable terms, by **CHARLES ILLIUS**,
20 Beaver St., New York.

Pig and other Iron also contracted for. Sole Agent for "*Baxter's Machine and Burning Oil*"—particularly adapted for "*Railroads*" and other Machinery—Preferred to Sperm by the many now using it, and 25 per cent. cheaper.

Coal.

CUMBERLAND SEMI-BITUMINOUS COAL
superior quality for Locomotives, for sale by **H. B. TEBBETTS**,
No. 40 Wall St., New York. 1m19
May 12, 1849.

GRAHAM'S COMPOSITION, to Remove and Prevent Incrustation (or Scale) in STEAM BOILERS.

THIS valuable composition having been fully and extensively tested, is now offered to the public, as a sure remedy and preventive for incrustations in steam boilers of all descriptions. By its use, all scale is entirely removed from the boilers of Ocean and River Steamers, Locomotive and Stationary Engines, in from 3 to 20 running days, according to the size of the boiler and thickness of the scale. In New Boilers, all incrustation is prevented at a trifling expense.

The preservation of the boiler, great economy of fuel and labor, safety, and increased speed, are among the advantages to be derived from the use of this composition.

Orders should state the quality of water used, viz: "Salt," "Fresh," or "Brackish."

For sale, with directions for use, by
W. H. NEWMAN,
75 Pearl street,
New York.

TESTIMONIALS.

New York, August 17, 1850.

We have used Graham's Composition in the boilers of the Steamship Southerner, during several voyages between this place and Charleston. The boilers were old and very foul with scale, a very large quantity of which was removed by the use of the composition, and no new scale was formed.

From our own experience and observation in the use of the article, we are fully satisfied that it will effectually remove the incrustation made by sea water, and also that it will effectually prevent its formation.

We are also satisfied that the use of it will be attended with a great saving of fuel, and that it has no injurious effect upon iron.

DAVID N. MAXON, Engineer,
BERRY, Master,
Steamship Southerner.

Steamship Philadelphia, }
New York, August 27, 1850.

I have used "Graham's Composition for Steam Boilers," in the boilers of Steamship Philadelphia, on the voyage to and from Chagres, and am entirely satisfied that it will remove, dissolve and prevent all scale or incrustation in salt water boilers.

For the preservation of the boiler and economy of fuel and labor, I hereby recommend the employment of this composition in the Boilers of Ocean Steamers.
WM. BISBY,
Chief Engineer.

Novelty Iron Works, }
New York, July 5, 1850.

We have examined the specimen of Graham's Composition for preventing incrustation of steam boilers, and we believe it may be used with perfect safety in reasonable quantities for the purpose intended, as there does not appear to be any agent in the composition calculated to injure the iron.

STILLMAN, ALLEN & CO.

Piermont, May 20, 1850.

I have used "Graham's Composition," and find it to produce the intended effect; and I hereby, without hesitation, recommend it for Stationary, Marine and Locomotive Engine Boilers.

JOHN BRANDT,
Superintendent Motive Power
New York & Erie R.R.

New York, July 25, 1850.

In answer to many inquiries as to the practical effect of "Graham's Composition," I will state that I have used it in the boiler of the Steamboat Sunwick, which had become considerably incrustated with hard scale from both salt and fresh water. We used 10 lbs. per day, for three days, without blowing off the water, until the fifth day, when all was drawn off. To our astonishment, we found the whole interior of the boiler as clear of scale and smooth as when it came from the hands of the maker. The following week, we tried the same quantity in a small steam tow boat.—The boiler had old scale of long accumulation and very thick. We ran the boat three days without blowing off, and on the fourth day washed out the boiler and found it, like the "Sunwick's," perfectly clean and smooth as when new. I am therefore enabled to state that the use of the composition in these two instances under my own immediate observation and direction, has been attended with complete success.

JAMES MORROW,
Engineer Astoria Ferry.



To Merchants, Railroad Companies, Machinists and Boiler Makers.

THE subscribers beg leave to call attention to their very large stock of Iron and Steel—of American, English, Swede and Norway make—of all the different kinds in use. Also, Railroad Iron, Ship, Boat and Railroad Spikes. They are also Agents for the *Best Pennsylvania Locomotive Boiler and Tank Iron*, each sheet of which will be stamped and warranted, at lowest mill prices. Our prices for all kinds of Iron will be found very low, either for cash or approved credit.

BRINK & DURBIN, Philadelphia.

ENGINEERS.**Atkinson, T. C.,**

Alexandria and Orange Railroad, Alexandria, Va.

Baneks, C. W.,

Civil Engineer, Vicksburg, Miss.

Buckland, George,

Troy and Greenbush Railroad.

Clement, Wm. H.,

Little Miami Railroad, Cincinnati, Ohio.

Cozzens, W. H.,

Engineer and Surveyor, St. Louis, Mo.

Alfred W. Craven,

Chief Engineer Croton Aqueduct, New York.

Davidson, M. O.,

Eckhart Mines, Alleghany Co., Maryland.

Fisk, Charles B.,

Cumberland and Ohio Canal, Washington, D. C.

Felton, S. M.,

Fitchburg Railroad, Boston, Mass.

Floyd-Jones, Charles,

South Oyster Bay, L. I.

Gzowski, Mr.,

St. Lawrence & Atlantic Railroad, Montreal, Canada.

Gilbert, Wm. B.,

Rutland and Burlington Railroad, Rutland, Vt.

Grant, James H.,

Nashville and Chattanooga R. R., Nashville, Tenn.

S. W. Hill,

Mining Engineer and Surveyor, Eagle River, Lake Superior.

Hewson, M. Butt,

Memphis, Tenn.

Holcomb, F. P.

Southwestern Railroad, Macon, Ga.

Johnson, Edwin F.

New York and Boston Railroad, Middletown Ct.

Latrobe, B. H.,

Baltimore and Ohio Railroad, Baltimore, Md.

Miller, J. F.,

Worcester and Nashua Railroad, Worcester, Mass.

Morris, Elwood,

Schuylkill Navigation, Schuylkill Haven, Pa.

Morton, A. C.,

Atlantic and St. Lawrence Railroad, Portland, Me.

McRae, John,

South Carolina Railroad, Charleston, S. C.

Nott, Samuel,

Lawrence and Manchester Railroad, Boston.

Prichard, M. B.,

East Tennessee and Georgia R. R., Cleveland, Tenn.

Roebbling, John A.,

Trenton, N. J.

W. Milnor Roberts,

Bellefontaine and Indiana Railroad, Marion, Ohio.

Roberts, Solomon W.,

Ohio and Pennsylvania Railroad, Pittsburgh, Pa.

Sanford, C. O.,

South Side Railroad, Virginia.

Schlatter, Charles L.,

Northern Railroad (Ogdensburg), Malone, N. Y.

Sours, Peter,

Rahway, New Jersey.

Stark, George.,

Bost., Con. and Mont. R. R., Meredith Bridge, N. H.

Steele, J. Dutton,

Pottstown, Pa.

Trautwine, John C.,

Panama Railroad—Address through office of Panama Railroad Co., 78 Broadway, N. Y.

Trimble, Isaac R.,

Philad., Wil. & Baltimore Railroad, Wilmington, Del.

Tinkham, A. W.,

United States Fort, Bucksport, Me.

Thomson, J. Edgar.,

Pennsylvania (Central) Railroad, Philadelphia.

Troost, Lewis,

Alabama and Tennessee Railroad, Selma, Ala.

Whipple, S.,

Civil Engineer and Bridge Builder, Utica, N. Y.

Williams, E. P.,

Auburn and Schenectady Railroad, Auburn, N. Y.

Williams, Charles H.,

Milwaukee, Wisconsin.

HOTELS.**Exchange Hotel,**Adjoining Eastern Railroad Depot,
BUFFALO, N. Y.BY.....**W. FISK & SPERRY,**
Late of Delevan House, Albany.**J. D. Abraham, Architect,**NO. 300 MAIN STREET,
BUFFALO, N. Y.**Fountain Hotel,**LIGHT STREET, BALTIMORE,
P. THURSTON.....Proprietor.**DUNLAP'S HOTEL,**On the European Plan,
NO. 135 FULTON STREET,
Between Broadway and Nassau St.,
NEW YORK.**MANSION,**Corner of Maine and Exchange Streets,
P. DORSHIMER. BUFFALO.**GUYS****United States Hotel,**(Opposite Pratt street Railroad Depot),
BALTIMORE.

JOHN GUY.

WILLIAM GUY.

American Hotel,Pratt street, opposite the Railroad Depot,
BALTIMORE.**HENRY M. SMITH.....Proprietor.**
Late of the Exchange & St. Charles Hotels, Pittsburg.**Washington Hotel,**BY JOHN GILMAN,
\$1 Per Day.
No. 206 Pratt street, (near the Depot),
BALTIMORE.**Barnum's City Hotel,**

MONUMENT SQUARE, BALTIMORE.

This Extensive Establishment, erected expressly for a Hotel, with every regard to comfort and convenience, is situated in the centre and most fashionable part of the city, and but a few minutes' walk from the Railroad Depots and Steamboat Landings.

The House has lately undergone a thorough repair, embracing many valuable improvements, and will accommodate 250 Guests. **BARNUM & CO.****JONES' HOTEL,**NO. 152 CHESTNUT STREET,
PHILADELPHIA.

BRIDGES & WEST, Proprietors.

BUSINESS CARDS.**Lithography.****JOHN P. HALL & CO.,**

161 Main st., Buffalo, (Commercial Advertiser Build.)

Are prepared to execute all kinds of Lithography in good style and at reasonable rates. Particular attention will be paid to Engraving Railroad Maps, Engineer's Plans and drafts, etc., and orders in this line are respectfully solicited.

J. T. Hodge

Will attend to the examination of mining tracts near Lake Superior, and prepare Reports and Maps.

Address, during the Summer,
[Ontanagon Postoffice, Lake Superior.**Cumberland Steam Coal,**

FROM THE

FROSTBURG MINES, MD.**H. A. TUCKER,**Agent of Frostburg Coal Co.
No. 50 Wall Street, New York.**Eaton, Gilbert & Co.,**Railroad Car, Coach and Omnibus Builders,
TROY, N. Y.**Charles T. Jackson, M. D.,**

STATE ASSAYER, late Geologist to Maine, Rhode Island, New Hampshire, and the United States, offers his services to his friends and the public in making any Chemical, Mineralogical or Geological researches that may be required for the improvement of Agriculture and the Manufacturing Arts. Particular attention will be paid to the exploration of mines and to assaying of ores of the metals.

State Assayer's office, 31 Somerset st.
Boston Sept. 3, 1850.**To Railroad Companies and Mechanical Establishments.**

A Person of considerable experience and practical knowledge in Mechanical, Civil and Marine Engineering, is anxious to meet with an engagement with either a Private Individual or Public Company, who may have works either to design or execute in the above branches of the Engineering Profession.

Address Z. Y., 47 Atlantic st., South Brooklyn, L. I.

STEEL AND FILES.**R. S. Stenton,**

20 CLIFF STREET, NEW YORK,

AGENT FOR

J. & RILEY CARR,BAILEY-LANE WORKS, SHEFFIELD,
Manufacturers of Cast, Shear, German, Blister, and
Spring Steel,

Of all descriptions, Warranted Good.

FILES.

Manufacturers of Machinists' Warranted Best Cast Steel Files, expressly for working upon Iron and Steel, made very heavy for recutting.

A full Stock of Steel and Files at all times on hand. 6m4

Walter R. Johnson,

CIVIL AND MINING ENGINEER AND ATTORNEY for Patents. Office and Laboratory, F St., opposite the Patent office, Washington, D. C.

Dudley B. Fuller & Co.,IRON COMMISSION MERCHANTS,
No. 139 GREENWICH STREET,
NEW YORK.**Manning & Lee,**GENERAL COMMISSION MERCHANTS,
NO. 51 EXCHANGE PLACE,
BALTIMORE.

Agents for Avalon Railroad Iron and Nail Works. Maryland Mining Company's Cumberland Coal 'CED'—Potomac' and other good brands of Pig Iron.

Cop Waste.

CLEAN COP WASTE, suitable for cleaning Railroad, Steamboat and Stationary Engines, constantly on hand and for sale by

KENNEDY & GELSTON,
51 Pine St., New York.

October 27, 1849,

3m

PLUSHES

FOR

Railway Cars & Omnibuses.**F. S. & S. A. MARTINE,**
112 WILLIAM ST., NEAR JOHN.

ARE now receiving a large and complete assortment of Plain and Figured **PLUSHES**, of their own importation, which will be sold at the lowest market price, viz: Crimson, Maroon, Scarlet, Green, Blue, Purple, etc.

ALSO—**CURLED HAIR**, the best manufactured in market.

Samuel Kimber & Co.,**COMMISSION MERCHANTS**

WILLOW ST. WHARVES, PHILADELPHIA.

AGENTS for the sale of Charcoal and Anthracite Pig Iron, Hammered Railroad Car and Locomotive Axles, Force Pumps of the most approved construction for Railroad Water Stations and Hydraulic Rams, etc., etc.
July, 27, 1849.

James Herron, Civil Engineer,OF THE UNITED STATES NAVY YARD,
PENSACOLA, FLORIDA,

PATENTEE OF THE

HERRON RAILWAY TRACK.

Models of this Track, on the most improved plans, may be seen at the Engineer's office of the New York and Erie Railroad.

To Railroad Companies.**—WROUGHT IRON WHEELS—**
SAFETY AND ECONOMY.**NORRIS' LOCOMOTIVE WORKS,**
SCHENECTADY, NEW YORK,

Are Manufacturing Wrought Iron Driving, Truck, Tender, and Car Wheels—made from the best American Iron. Address
E. S. NORRIS.
May 16, 1849.

Manufacture of Patent Wire
ROPE AND CABLES,

For Inclined Planes, Suspension Bridges, Standing Rigging, Mines, Cranes, Derrick, Tilters, &c., by
JOHN A. ROEBLING, Civil Engineer,
TRENTON, N. J.

Doremus & Harris,ANALYTICAL & CONSULTING CHEMISTS,
179 BROADWAY, NEW YORK.**SCHOOL OF CHEMISTRY.****To Engineers and Surveyors.**

E. BROWN AND SON Mathematical inst. makers No. 27 Fulton Slip, New York, make and keep for sale, Theodolites, Levelling inst., Levelling rods, Surveyors Compasses, and Chains, Cases of Mathematical drawing insts. various qualities, together with a general assortment of Ivory Scales and small insts. generally used by Engineers.

FORGING.**Ranstead, Dearborn & Co.,**MANUFACTURERS OF
LOCOMOTIVE CRANKS AND CAR AXLES,

ALSO

WROUGHT IRON SHAFTING,

And All Kinds of Hammered Shapes.
Office 25 Foster's Wharf, Boston.

Henry I. Ibbotson,

IMPORTER of Sheffield and Birmingham Goods.
Also, Agent for the Manufacture of Telegraph Wire.
218 PEARL ST., NEW YORK.

Cumberland, (Md.) Coals for
Steaming, etc.

ORDERS RECEIVED FOR AND FILLED
by
J. COWLES, 27 Wall St., N. Y.

Samuel D. Willmott,

MERCHANT, AND MANUFACTURER OF
CAST STEEL WARRANTED SAWS,
—AND FILES—

IMPORTER OF THE
GENUINE WICKESLY GRINDSTONES
NO. 8 LIBERTY STREET,
NEW YORK.

Railroad Instruments.

THEODOLITES, TRANSIT COMPASSES,
and Levels, with Fraunhoffer's Munich Glasses,
Surveyor's Compasses, Chains, Drawing Instruments,
Barometers, etc., all of the best quality and
workmanship, for sale at unusually low prices, by
E. & G. W. BLUNT,

No. 179 Water St., cor. Burling Slip.
New York, May 19, 1849.

IRON.**Car Wheel Iron.**

100 Tons "Columbia" No. 2 Cold Blast Charcoal
Iron.

300 Tons "Salisbury" No. 1, do. do.
For sale by **CHARLES T. GILBERT**,
No. 80 Broad st.

New York, Sept. 21, 1850.

Railroad Spikes.

THE subscribers are prepared to make and execute
contracts for Railroad Spikes of a superior quality,
manufactured by the New Jersey Iron Company,
at Boonton. **DUDLEY B. FULLER & CO.**
139 Greenwich st. corner of Cedar.

Railroad Iron.

FOR SALE—500 Tons of superior flat bar Railroad
Iron, two and a half by three-fourths—which has
been in use on the Cumberland Valley Railroad for
about three years. For terms apply to Henry J. Bid-
dle, Esq., Philadelphia, or to **FREDK. WATTS**,
President of the Cum. Val. R R., Carlisle, Pa.
Carlisle, Sept. 17, 1850.

Railroad Iron.

1650 Tons, weighing about 61 lbs. per yard, 40
tons, weighing about 52 lbs. per yard, and
825 tons, weighing about 53½ lbs. per yard, of the lat-
est and most approved patterns of T rail, for sale by
BOORMAN, JOHNSTON & CO.,
119 Greenwich street.

New York, Aug. 26, 1850.

N.B.—B. J. & Co are also prepared to take con-
tracts for English rails, delivered in any of the Atlan-
tic ports of the United States.

Railroad Iron.

THE Undersigned, Agents for Manufacturers, are
prepared to contract to deliver Rails of superior
quality, and of any size or pattern, to any ports of dis-
charge in the United States.

COLLINS, VOSE & CO.,
74 South St.

New York, June 1, 1850.

Railroad Iron.

1,500 Tons weighing 58 lbs. per lineal yard.

500 " " 57 " "
500 " " 56 " "
500 " " 60 & 61 lbs. "

Also 2½ flat rails. All the above being of approv-
ed patterns. For sale by

DAVIS, BROOKS, & CO.,
68 Broad street.

N.B.—Rails imported on commission, or at a fixed
price.

Iron.

Pig Iron, Anthracite and Charcoal; Boiler and Flue
Iron, Spring and Blistered Steel, Nail Rods, Best Re-
fined Bar Iron, Railroad Iron, Car Axles, Nails, Stove
Castings, Cast Iron Pipes of all sizes, Railway Chairs
of approved patterns for sale by

COLEMAN, KELTON & CAMBELL,
109 N. Water St., Philadelphia.

Railroad Iron.

THE UNDERSIGNED, HAVING made arrange-
ments abroad, are prepared to contract for the deliv-
ery of Foreign rails, of approved brands upon the
most favorable terms.

They will also make contracts for American rails,
made at their Trenton works, from Andover Iron, in
whole or in part, as may be agreed upon.

They are prepared to furnish Telegraph, Spring and
Market Wire; Braziers and Wire Rods; Rivets and
Merchant Bars to order, all made exclusively from An-
dover Iron. The attention of parties who require iron
of the very best quality for special purposes, is respect-
fully invited.

COOPER & HEWITT,
17 Burling Slip, New York.

February 15, 1850.

Glendon Refined Iron.

Round Iron, Band Iron, Hoop Iron,
Square " Flat " Scroll "

Axles, Locomotive Tyres,
Manufactured at the Glendon Mills, East Boston, for
sale by **GEORGE GARDNER & CO.**,
5 Liberty Square, Boston, Mass.

Sept. 15, 1849.

3m37

**PATENT HAMMERED RAILROAD, SHIP &
BOAT SPIKES.**—The Albany Iron Works
have always on hand, of their own manufacture, a
large assortment of Railroad, Ship and Boat Spikes
from 2 to 12 inches in length, and of any form of head
From the excellence of the material always used in
their manufacture, and their very general use for rail-
roads and other purposes in this country, the manu-
facturers have no hesitation in warranting them fully
equal to the best spikes in market, both as to quality
and appearance. All orders addressed to the subscrib-
ers at the works will be promptly executed.

JOHN F. WINSLOW, Agent.

Albany Iron and Nail Works, Troy, N. Y.
The above Spikes may be had at factory prices, of
**Erastus Corning & Co Albany; Menitt & Co., New
York; E. Pratt & Brainerd, Eastimere, Md.**

LAP—WELDED
WROUGHT IRON TUBES

FOR

TUBULAR BOILERS,

FROM ONE AND A QUARTER TO SEVEN
INCHES IN DIAMETER.

THE ONLY Tubes of the same quality and man-
ufacture as those so extensively used in England,
Scotland, France and Germany, for Locomotive, Ma-
rine and other Steam Engine Boilers.

THOMAS PROSSER & SON, Patentees,
28 Platt street, New York.

Railroad Iron.

THE UNDERSIGNED ARE PREPARED TO
contract for the delivery of English Railroad Iron
of favorite brands, during the Spring. They also re-
ceive orders for the importation of Pig, Bar, Sheet, etc.
Iron.

THOMAS B. SANDS & CO.,
73 New street,
New York.

February 3, 1849.

Iron Store.

THE Subscribers, having the selling agency of the
following named Rolling Mills, viz: Norristown,
Rough and Ready, Kensington, Triadelphia, Potts-
grove and Thorndale, can supply Railroad Companies,
Merchants and others, at the wholesale mill prices for
bars of all sizes, sheets cut to order as large as 58 in.
diameter; Railroad Iron, domestic and foreign; Loco-
motive tire welded to given size; Chairs and Spikes;
Iron for shafting, locomotive and general machinery
purposes; Cast, Shear, Blister and Spring Steel; Boil-
er rivets; Copper; Pig iron, etc., etc.

MORRIS, JONES & CO.,
Iron Merchants,

Schuylkill 7th and Market Sts., Philadelphia.
August 16, 1849. ly33

Railroad Iron.

THE MOUNT SAVAGE IRON WORKS, AL-
leghany county, Maryland, having recently pass-
ed into the hands of new proprietors, are now prepar-
ed, with increased facilities, to execute orders for any
of the various patterns of Railroad Iron. Communi-
cations addressed to either of the subscribers will have
prompt attention. **J. F. WINSLOW, President**

Troy, N.Y.

ERASTUS CORNING, Albany;**WARREN DELANO, Jr., N.Y.****JOHN M. FORBES, Boston.****ENOCH PRATT, Baltimore, Md.**

November 6, 1848.

Railroad Iron.

THE SUBSCRIBERS ARE PREPARED TO
take orders for Railroad Iron to be made at their
Phoenix Iron Works, situated on the Schuylkill River,
near this city, and at their Safe Harbor Iron Works,
situated in Lancaster County, on the Susquehanna
river; which two establishments are now turning out
upwards of 1800 tons of finished rails per month.

Companies desirous of contracting will be promptly
supplied with rails of any required pattern, and of the
very best quality.

REEVES, BUCK & CO.
45 North Water St. Philadelphia,

March 15, 1849.

Tredegar Iron Works.

ROLLING MILL FOUNDRY AND MACHINE SHOPS. The undersigned continues to manufacture at his Works in this city (from best charcoal metal) Bar Iron of every description, embracing—Rounds and Squares, from 1½ to 5 inches diameter. Flats, from ½ to 7 inches, all thicknesses. Bands and Scrolls, all sizes. Boiler plate and Plough Iron. Railroad and Locomotive Axles and Tires. Locomotive Frames, Spikes and Plates. Hoops, Ovals, Half Ovals, Half Rounds, Angle, T. L., and indeed every description of Iron usually manufactured, all of which he warrants to be equal to any made in this country. He also manufactures at his Foundry and Machine Shops all descriptions of Railroad Work, say, Locomotives, Railroad Wheels and Axles complete and ready for the road, Railroad Chairs, etc. Also, Marine and Stationary Engines all sizes, Sugar mills and Engines, Horse mills, and every kind of Machinery usually required for the operations of the country. He has paid particular attention to getting up machinery, etc., for Gold Mine operations, and those in want of such work might find it to their advantage to give him a call.

J. R. ANDERSON.
Richmond, Va., Sept. 10, 1850.

CUT NAILS OF BEST QUALITY, BAR IRON (including Flat Rails) manufactured and for sale by
FISHER, MORGAN & CO.,
75 N. Water St., Philadelphia.

Iron Wire.

REFINED IRON WIRE OF ALL KINDS, Card, Reed, Cotton-flyer, Annealed, Broom, Buckle, and Spring Wire. Also all kinds of Round, Flat or Oval Wire, best adapted to various machine purposes, annealed and tempered, straightened and cut any length, manufactured and sold by
ICHABOD WASHBURN.
Worcester, Mass., May 25, 1849.

Wheel, Forge and Foundry Iron.

LOCUST GROVE Wheel Iron of great strength and superior chilling property.
Balt. Charcoal Forge Iron, from Patuxent, Curtis Creek and Gunpowder furnaces.
Elkridge Foundry Iron, of superior strength and softness. Anthracite and Charcoal Iron from Pennsylvania and Virginia. Gas and Water Pipes, Lamp Poles from Elkridge furnace.

LEMMON & GLENN,
6m9 62 Buchanan's Wharf, Baltimore.

S. S. Keyser & Co., IRON WAREHOUSE,

Corner of South and Pratt Streets, BALTIMORE, MD.
Selling Agents for the Rough and Ready Bar Iron and Elk Boiler and Flue Iron Rolling Mills, Sarah and Taylor Furnaces, and Wrightsville Hollow Ware Foundry, and Dealers in Bar and Sheet Iron, and Cast, Sheer, German, Blister, Spring and Electroplated Steel, etc., etc.

Smith & Tyson,

GENERAL COMMISSION MERCHANTS,
No. 25 South Charles St., Baltimore, Md.

AGENTS for the Celebrated Columbia Pig Iron, suitable for Car Wheels and Chilled Rolls.
Columbia refined Charcoal Blooms; Refined Charcoal Juniata Billet Iron for Wire; Refined Iron for Bridging, of great strength; Cut Nails, Spikes, and Brads; Railroad Spikes and Wrought Chairs. 22tf

Stickney & Beatty, DEALERS IN IRON AND IRON MANUFACTURERS.

AGENTS for the Balt. City Rolling Mill, from which establishment they are prepared to furnish Ellicott's round, square, and flat bar iron, puddled and charcoal boiler plates and billet iron—also agents for the sale of the Laurel and Maryland (Balt.) charcoal forge pig irons, Balt. hard iron for chilling wheels, anti-Eatam nails, Catoctin foundry iron, boiler blooms from the Caledonian works, Wm. Jessop & Son's cast steel, Coleman's blister steel and nail rods, hoop, band, sheet, oval and common English iron.
Nos. 18 and 20 South Charles st., Baltimore.

Railroad Iron.

CONTRACTS made by the subscribers, agents for the manufacturers, for the delivery of Railway Iron, at any port in the United States, at fixed prices, and of quality tried and approved for many years, on the oldest railways in this country.
RAYMOND & FULLERTON, 45 Cliff St.

IRONDALE PIG METAL, MANUFACTURED and for sale by the Bloomsburg Railroad Iron Co.
LINDLEY FISHER, Treasurer.
75 N. Water St., Philadelphia.

Railroad Iron.

2000 Tons, weighing 58 pounds per lineal yard, of the most approved pattern of T rails, in store and to arrive, for sale by
COLLINS, VOSE & CO.,
74 South St.
New York, June 1, 1850.

Railroad Iron.

3,000 TONS C. L. MAKE 63½ lbs. per yard, now landing and to arrive.
Also contracts made for future delivery of above superior make English Iron.
300 Tons Banks Best Iron, Round, Square and Flat.
200 " English Bar " " " "
10 " 9-16 Square Iron for Railroad Spikes.
For sale in lots to suit purchasers by
DAVID W. WETMORE.
New York, March 26, 1850. 3m

WILLIAM JESSOP & SONS' CELEBRATED CAST-STEEL.

The subscribers have on hand, and are constantly receiving from their manufactory,
PARK WORKS, SHEFFIELD,
Double Refined Cast Steel—square, flat and octagon. Best warranted Cast Steel—square, flat and octagon. Best double and single Shear Steel—warranted. Machinery Steel—round.
Best and 2d gy. Sheet Steel—for saws and other purposes.
German Steel—flat and square, "W. I. & S." "Eagle" and "Goat" stamps.
Genuine "Sykes" L Blister Steel.
Best English Blister Steel, etc., etc., etc.
All of which are offered for sale on the most favorable terms by
WM. JESSOP & SONS,
91 John street, New York.
Also by their Agents—
Curtis & Hand, 47 Commerce street, Philadelphia.
Alex'r Fullerton & Co., 119 Milk street, Boston.
Stickney & Beatty, South Charles street, Baltimore.
May 6, 1849.

JOHNSON, CAMMELL & Co's Celebrated Cast Steel,

AND ENGINEERING AND MACHINE FILES, which for quality and adaptation to mechanical uses, have been proved superior to any in the United States. Every description of square, octagon, flat and round cast steel, sheet, shovel and railway spring steel, best double and single shear steel, German steel, flat and square, goat stamps, etc. Saw and file steel, and steel to order for any purposes, manufactured at their Cyclops Steel Works Sheffield.
JOHNSON, CAMMELL & CO.,
100 William St., New York.
November 23 1849.

Railroad Iron.

THE Undersigned, Agents for Manufacturers, are prepared to contract for the delivery of English, Welsh and Scotch Rails, of any pattern and weight, also for every description of English, Welsh, Scotch, and Swedish Iron, Railway Chairs and Spikes, Rivets, Bolts, Nuts, Washers, Chain Cables, Anchors, Tin Plates, German Spelter, Iron Castings, and every description of Machinery.

WILLIAM BIRD & CO.,
Iron and Tin Plate Merchants,
44 Wall st., New York.

And at 5 Martin's Lane, City, London,
and 140 Buchanan st., Glasgow.

July 27th, 1850.

To the Proprietors of Rolling Mills and Iron Works.

THE Undersigned—Proprietors of Townsend's Furnace and Machine Shop, Albany—are extensively engaged in the manufacture of Machinery and fixtures for Iron, and Copper Rolling Mills, and Iron Works. Having paid particular attention to the manufacture of *Rolls* (Rollers), both *chilled and dry-sand*, they feel confident that they can execute orders for such castings in a satisfactory manner. And to give assurance of this, they beg leave to refer to the following named persons, proprietors and managers of some of the most extensive rolling mills in the country, viz: Jno. F. Winslow, J. Tuckerman, H. Burden, W. Burt, J. & J. Rogers, Saitus & Co., J. B. Bailey, L. G. B. Cannon, Hawkins & Atwater, etc., etc.
F. & T. TOWNSEND.
Albany, August 18, 1849.

Railroad Iron.

B. O. Railway Tires, Railway Wheels,
Scotch Pig Iron, Tin Plates and Banca Tin,
Muntz's Patent Metal Sheathing,
Baltimore Copper.

Contracts for Rails made on behalf of the manufacturers, for delivery at any ports in the United States, at fixed prices.
Bowling Tires and Tire Bars and Scotch Pigs imported to order.

Muntz's Ship-sheathing, and a general stock of Tin Plates and Banca Tin in store, and for sale by
RAYMOND & FULLERTON, 45 Cliff st.

Bowling Iron. Stamped B.O.

Railway Tire Bars Rivet Iron
Locomotive and other Axles Locomotive Frame do
Boiler Plates Bars,
and every other description of this superior Iron.

The subscribers, agents for the sale of Bowling Iron, are prepared to execute orders for importation, especially for railway and machinery uses, with despatch from the manufacturers.

RAYMOND & FULLERTON, 45 Cliff st.

Lovegrove's Patent Cast Iron Water and Gas Pipes.

THE Subscriber, the Inventor and Patentee of the Centrifugal mode of giving form to metallic substances while in a molten state, is preparing to make Cast Iron Water and Gas Pipes, of any dimensions, at prices much lower than they can be made in the old manner, and the pipes warranted to stand a pressure of three hundred pounds to the square inch, and to be soft enough to drill. Steam Engines and all kinds of machinery. Cast Iron Doors and Frames, and Mill Castings of every description, made to order.

THOMAS LOVEGROVE,
Machinist and Founder,
West Falls Avenue, below Pratt st., Baltimore.

Ray's Patent India Rubber Car Springs.

Savannah, Ga., May 22, 1850.

FOWLER M. RAY, Esq.,
Dear Sir: I have no hesitation in saying, after having used on our road your springs and Fuller's, that I consider yours decidedly the best in every particular, and in this opinion I am sustained by all our officers. Fuller's spring has a tendency to split, and also to chafe or abrade by the constant friction on the cast iron plates or disc: and in my opinion is not near so elastic as yours.

Your springs, which have been in use on our road for 12 or 15 months past, and in constant use under both passenger and freight cars, are to all appearances as elastic, sound and good, as when first put in use.

We are now building eighty-five new cars, of which for fifty-sets the springs have been ordered of you.

GEORGE A. ADAMS,
Master Carpenter,
Central Railroad and Banking Co. of Georgia.

Connecticut River Railroad Office,
Northampton, May 4, 1850.

E. CRANE, Esq.,
Dear Sir: It is now about two years since I first tried the experiment of using a set of Ray's India-rubber Springs upon one of our merchandise cars, and although the car has been in constant service since that time, I do not on examination find the slightest difference either in the thickness or elasticity of the material.

The same result has followed wherever we have applied them, either for wheel or draw springs on Engines, Tenders or Cars. At present we use no other; either in replacing old springs or building new cars—and I am perfectly satisfied that for economy, durability, safety, and ease of motion, that Ray's India-rubber is the best article for Springs which has been presented to the public.

Yours respectfully, **J. HUNT,**
Supt. Connecticut River Railroad.

EDWARD CRANE, Esq.,
Dear Sir: Having applied to cars of the Boston and Worcester Railroad Corporation, Ray's Vulcanized Rubber Springs (where they have been in use for some two years last past), I have had occasion to observe their operation, and am free to say in answer to your inquiries, that they retain their elasticity perfectly during all changes of atmospheric temperature: and are in my opinion a most valuable acquisition to Railroad Cars—are not liable to derangement, as is the case with steel springs; while at the same time it costs less to apply them. Respectfully yours,

D. N. PICKERING,
Supt. Motive Power, Bos. & Wor. Railroad.
Boston, April 15th, 1850.

Monument Foundry.

A. & W. DENMEAD & SON,
Corner of North and Monument Sts.,—Baltimore,
HAVING THEIR

IRON FOUNDRY AND MACHINE SHOP

In complete operation, are prepared to execute faithfully and promptly, orders for Locomotive or Stationary Steam Engines, Woolen, Cotton, Flour, Rice, Sugar Grist, or Saw Mills,

Slide, Hand or Chuck Lathes, Machinery for cutting all kinds of Gearing, Hydraulic, Tobacco and other Presses, Car and Locomotive patent Ring Wheels, warranted,

Bridge and Mill Castings of every description, Gas and Water Pipes of all sizes, warranted, Railroad Wheels with best faggotted axle, furnished and fitted up for use, complete

Being provided with Heavy Lathes for Boring and Turning Screws, Cylinders, etc., we can furnish them of any pitch, length or pattern.

Old Machinery Renewed or Repaired—and Estimates for Work in any part of the United States furnished at short notice.

June 8, 1849.

RAILROAD CAR AND COACH TRIMMINGS.

Doremus & Nixon,
IMPORTERS AND FURNISHERS

HAVE FOR SALE

Plain Garnet Plush. Fig. Garnet Plush (Butterfly pat.
" Crimson " " Crimson " (Elegant.
" Scarlet " " " " (Gen. Taylor.

BROCATELLES.

Crimson Silk Brocatelles. Gold and Maroon do.
Gold and Blue " " Brown " do.
Silk and Wool " " of every color.

MOQUETTES.

Of elegant designs and colors.

GERMAN CLOTH FOR CAR LININGS.

The most beautiful goods ever shown in this country, and the subscribers are the sole agents for the sale of them.

Oil cloths Enamelled with Gold. These goods can be
" " Silver. furnished in any
Do. Silver ground velvet printed. dimensions req'd.

CURLED HAIR

Of every description and quality.

JNO. W. A. STRICKLAND, Agent.
New York, 1850. 1y16

FOWLER M. RAY'S Patent India-rubber Railroad CAR SPRING.

New York and Erie Railroad Shops,
Piermont, March 26, 1850.

This will certify that from practical experience in the use of Fowler M. Ray's India rubber Car Springs, I believe them to be far superior to any others now in use.

I have never known them to be affected by any change of temperature, as other Rubber Springs have been affected on this road.

I am at the present time repairing a Passenger Car that Mr. Ray and myself mounted with his springs about two years and eight months since.

The springs are at the present time as perfect, to all appearances, as when first applied to the car.

Respectfully yours,

HORACE B. GARDNER,
Foreman of the Car Shops.

Supt. Office N.Y. & H. R.R., }
New York, March 8, 1850.

This is to certify that we have used the Rubber Springs manufactured by Mr. F. M. Ray for the past twenty months, "both for Passenger and Freight Car Springs and Bumpers, and of different sizes," and have in every case given entire satisfaction, and I consider them the best spring now in use

M. SLOAT, Supt.

Boston, March 5, 1850.

In answer to your enquiry about India-rubber Springs, I have to say that we have used them to a considerable extent on both freight and passenger cars, and also on several of our tenders; and I am very well satisfied that they answer all the purposes for which they are intended. I believe the India-rubber will soon supersede all other springs for cars and tenders.

Yours truly,

S. M. FELTON,
Supt. Fitchburg Railroad.

Office New Jersey Railroad Co., }
Jersey City, March 8, 1850. }

FOWLER M. RAY, Esq.,

Dear Sir: In answer to your enquiries respecting the operation of the Vulcanised Rubber Springs, purchased by our company from you some two years since, I reply that they are superior to any spring in use, (that I have either seen or heard of).

The improved form of your spring, consisting of a solid piece of vulcanised rubber with bands on the outside, is far superior to your first form, consisting of disks of rubber with metallic plates interposed.

The last named form was tried, if you recollect, at a much earlier period; and then was replaced by your last form.

I have no hesitation in saying that your springs have given entire satisfaction, and most cheerfully recommend them to railroad companies throughout the country for the following reasons:

1st. The cost is 30 per cent. less.
2d. Saving of weight on each car of 8 wheels from 700 to 800 lbs.

3d. Less care and attention is required, as they are not liable to get out of repair.

4th. A great saving is secured in the wear and tear of the cars and rails from their great elasticity.

5th. The freedom from noise.

6th. There is greater safety in case of accident, as they cannot be broken.

7th. The comfort of passengers is enhanced sufficiently to pay the expense, waiving all the other reasons that I have given.

Should this fail to satisfy any person enquiring, you are at liberty to refer to me, No. 150 Washington St., Jersey City. Yours respectfully,

T. L. SMITH, Supt.

New York, March 11, 1850.

I have used the Patent India-rubber Spring purchased of Mr. Ray, upon the cars of the New York and New Haven Railroad, and have found them efficient and economical; and when applied to the axles and draw springs, believe them to be quite equal to any in use. I have found a combination of these springs with a steel spring under the transom beam a very satisfactory arrangement, and am now using this plan in all new cars.

Yours respectfully,

ROBERT SCHUYLER.

February 25, 1850.

From practical observation of the use of the India-rubber Car Springs, manufactured and sold by your company, we are entirely satisfied in their application, and do not hesitate to recommend them as elastic, durable, requiring no repairs for years, and retaining their consistency during all extremes of weather. We have applied them for the past two years, and consider them superior for all railroad purposes.

Yours truly,

OSGOOD BRADLEY, Car Builder, Worcester.
T. & C. WASON, do, Springfield.
DEAN, PACKARD & MILLS, do, do.
DAVENPORT & BRIDGES, do, Cambridgeport.

Office of the New Jersey Railroad Co., }
Jersey City, March 7, 1850. }

This is to certify that we have had Mr. F. M. Ray's India-rubber Springs in constant use under our cars, and as Bumper Springs for upwards of two years, and they have in every way given perfect satisfaction.

The present form of spring we deem far superior to the form of Disk, having used both forms, although we have none of those made in Disks at present in use.

We take pleasure in recommending these springs to all railroad companies.

J. P. JACKSON, Vice Pres.
New Jersey Railroad and Trans. Co.

Roxbury, February 28, 1850.

In compliance with your request, I take great pleasure in stating the result of my experience in the use of "Ray's Patented Vulcanised India-rubber Car and Engine Springs." We have used them nearly two years, and never had one fail in any way. The cold weather does not affect them, as it has other rubber springs we have used.

With sixteen years' experience as superintendent of machinery on the Boston and Providence railroad, I take pleasure in saying that your springs are the best we ever used, or I ever saw used elsewhere. We have 20 cars rigged with them, of which I can say that the springs are as good now as when first applied. I put 24 lbs. of the rubber under the forward end of one of our heaviest engines, taking off 250 lbs. of steel springs—it has been in use 18 months, and is in as good condition now as when first put under the engine.

Very respectfully yours,

GEO. S. GRIGGS,
Supt. of Machinery, Boston and Prov. R.R.

Fall River, February 2, 1850.

In answer to yours of the 20th ult. I would say that this company has for some 10 or 12 months past been using "Ray's India-rubber Springs." We have applied them to both passenger and freight cars with uniform success. They have invariably preserved their elasticity and consistency through all the extremes of weather; and we are now applying them whenever the steel spring fails. I am well satisfied that they are particularly adapted for railroad purposes.

Very respectfully yours,

GEO. HAVEN,
Supt. Fall River Railroad.

Jersey City, March 9, 1850.

This is to certify that the present form of Mr. F. M. Ray's India-rubber Car Spring I consider far superior to the form of Disk, having used both forms.

I take pleasure in recommending these springs to all railroad companies.

DAVID H. BAKER,
Foreman of Car Shop of N.J. R.R. & Trans. Co.

Harlem R.R. Depot, }
New York, March 7, 1850. }

This is to certify that we have used Mr. F. M. Ray's India-rubber Springs for over eighteen months, and find them to be easy and durable, and recommend them to railroad companies, as being superior to anything we have tried.

J. M. SMART,

Foreman at 42d St. Depot.

Old Colony Railroad Office,
Boston, March 6, 1850.

EDWARD CRANE, Esq.,

President New England Car Co.,

Dear Sir: In compliance with your request I would state that the Old Colony Railroad Com'y have had in use upon their road, India-rubber Springs furnished by your company, for more than eighteen months past, during which time they have been extensively used under Passenger and Freight Cars, Locomotive Tenders, and for Drawer and Buffering Springs, with the most perfect success. The elasticity and consistency of the Rubber has never been unfavorably affected by either extremes of heat or cold—and from the experience which we have had in the use of Rubber Springs, I think them well adapted for railroad purposes—and therefore we have for some months past used Rubber almost exclusively, in all places where springs are required.

Respectfully yours, etc.,

JAS. H. MOORE,
Supt. O. C. Road.

Troy, February 27, 1850.

We have been using your India-rubber Car Springs for nearly two years—and we take pleasure in saying that in our opinion the rubber has to a certain extent already, and may eventually entirely supersede all other Springs for Railroad Car purposes. We now use it entirely for Draw Springs and Bumpers, considering it better and lighter than steel.

During our two years' experience in the use of it, we have not known any to lose their elasticity, or fail in any way; and we cheerfully recommend the rubber for railroad car springs. Very respectfully,
EATON, GILBERT & CO.

Passenger Car Linings.

THE Advertiser continues to make to order the Enamelled Car Linings which have been so highly approved the last three years, and are now exclusively used by all the Northern Railroads. No pains are spared to get out new styles, and adapt them to the tastes of every consumer.

Orders addressed to **CHARLES STODDER, No. 75 Kilby street, Boston,** will have prompt attention.
March 23, 1850. 2m

India-rubber for Railroad Cos.

RUBBER SPRINGS—Bearing and Buffer—Fowler's Patent—Hose from 1 to 12 inches diameter. Suction Hose. Steam Packing—from 1-16 to 2 in. thick. Rubber and Gutta Percha Bands. These articles are all warranted to give satisfaction, made under Tyer & Helm's patent, issued January, 1849.—No lead used in the composition. Will stand much higher heat than that called "Goodyear's," and is in all respects better than any in use. Proprietors of railroads do not be overcharged by pretenders.

HORACE H. DAY,

Warehouse 23 Courtlandt street.

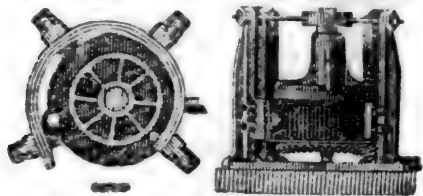
New York, May 21, 1849.

Spikes, Spikes, Spikes.

ANY person wishing a simple and effective Spike Machine, or a number of them, may be supplied by addressing
J. W. FLACK,
Troy, N. Y.
March 6, 1850.

MACHINERY.

Henry Burden's Patent Revolving Shingling Machine.



THE Subscriber having recently purchased the right of this machine for the United States, now offers to make transfers of the right to run said machine, or sell to those who may be desirous to purchase the right for one or more of the States.

This machine is now in successful operation in ten or twelve iron works in and about the vicinity of Pittsburgh, also at Phoenixville and Reading, Pa., Covington Iron Works, Md., Troy Rolling Mills, and Troy Iron and Nail Factory, Troy, N. Y., where it has given universal satisfaction.

Its advantages over the ordinary Forge Hammer are numerous: considerable saving in first cost; saving in power; the entire saving of shingler's, or hammerman's wages, as no attendance whatever is necessary, it being entirely self-acting; saving in time from the quantity of work done, as one machine is capable of working the iron from sixty puddling furnaces; saving of waste, as nothing but the scoria is thrown off, and that most effectually; saving of staffs, as none are used or required. The time required to furnish a bloom being only about six seconds, the scoria has no time to set, consequently is got rid of much easier than when allowed to congeal as under the hammer. The iron being discharged from the machine so hot, rolls better and is much easier on the rollers and machinery. The bars roll sounder, and are much better finished. The subscriber feels confident that persons who will examine for themselves the machinery in operation, will find it possesses more advantages than have been enumerated. For further particulars address the subscriber at Troy, N. Y. P. A. BURDEN.

Railroad Spikes and Wrought Iron Fastenings.

THE TROY IRON AND NAIL FACTORY, exclusive owner of all Henry Burden's Patented Machinery for making Spikes, have facilities for manufacturing large quantities upon short notice, and of a quality unsurpassed.

Wrought Iron Chairs, Clamps, Keys and Bolts for Railroad fastenings, also made to order. A full assortment of Ship and Boat Spikes always on hand.

All orders addressed to the Agent at the Factory will receive immediate attention.

P. A. BURDEN, Agent,
Troy Iron and Nail Factory, Troy, N. Y.

CHILLED RAILROAD WHEELS.—THE UNDERSIGNED are now prepared to manufacture their Improved Corrugated Car Wheels, or Wheels with any form of spokes or discs, by a new process which prevents all strain on the metal, such as is produced in all other chilled wheels, by the manner of casting and cooling. By this new method of manufacture, the hubs of all kinds of wheels may be made whole—that is, without dividing them into sections—thus rendering the expense of banding unnecessary; and the wheels subjected to this process will be much stronger than those of the same size and weight, when made in the ordinary way.

A. WHITNEY & SON,
Willow St., below 13th,
Philadelphia, Pa.

Brown's Old Established SCALE WARE HOUSE,

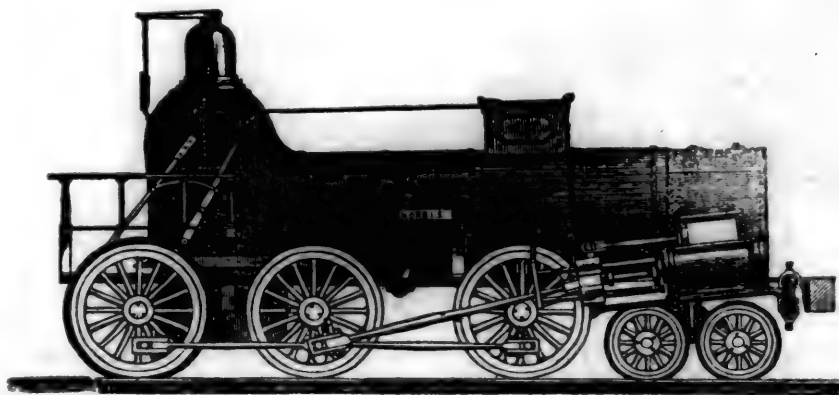
NO. 234 WATER ST., NEW YORK.

THE Subscriber, Practical Manufacturer of Scales of every description, respectfully asks the attention of Railroad Companies to his Improved Wrought Iron Railroad Track and Depot Scales which for strength, durability, accuracy, convenience in weighing, and beauty of workmanship, are not surpassed by any others in this country.

He is aware that this is rather a bold assertion for him to make, yet he can say with confidence that they have but to be tried to give them precedence over all others. J. L. BROWN.

Bank Scales made to order, and all Scales of his make Warranted in every particular.

References given if required

NORRIS' LOCOMOTIVE WORKS.
BUSHHILL, SCHUYLKILL SIXTH-ST., PHILADELPHIA,

THE UNDERSIGNED Manufacture to order Locomotive Steam Engines of any plan or size. Their shops being enlarged, and their arrangements considerably extended to facilitate the speedy execution of work in this branch, they can offer to Railway Companies unusual advantages for prompt delivery of Machinery of superior workmanship and finish.

Connected with the Locomotive business, they are also prepared to furnish, at short notice, Chilled Wheels for Cars of superior quality.

Wrought Iron Tyres made of any required size—the exact diameter of the Wheel Centre, being given, the Tyres are made to fit on same without the necessity of turning out inside.

Iron and Brass castings, Axles, etc., fitted up complete with Trucks or otherwise.

NORRIS, BROTHERS

PATENT MACHINE MADE HORSE-SHOES.

The Troy Iron and Nail Factory have always on hand a general assortment of Horse Shoes, made from Refined American Iron.

Four sizes being made, it will be well for those ordering to remember that the size of the shoe increases as the numbers—No. 1 being the smallest.

P. A. BURDEN, Agent,
Troy Iron and Nail Factory, Troy, N. Y.

Etna Safety Fuse.

THIS superior article for igniting the charge in wet or dry blasting, made with DUPONT'S best powder, is kept for sale at the office and depot of

REYNOLDS & BROTHER,

SOLE MANUFACTURERS,
No. 85 Liberty St.

NEW YORK.

And in the principal cities and towns in the U. States. The Premium of the AMERICAN INSTITUTE was awarded to the Etna Safety Fuse at the late Fair held in this city.

November 3, 1849.

ly

COLUMBUS, OHIO,

Railroad Car Manufactory.
RIDGWAYS & KIMBALL,

HAVE established at this central point, the manufacture of Passenger, Freight, Gravel and Hand Cars for Railroads, and assure all Western Railroad Companies that it will be their constant aim to procure the best materials and workmen, and to turn out the best kind of work at fair prices. Specimens may be seen on the Columbus and Xenia Railroad. The patronage of Railroad Companies is respectfully solicited. 1y8

To Inventors and Patentees.

OWEN G. WARREN, ARCHITECT, Has had many years' experience as Agent for obtaining Patents, both in this country and Europe, and will transact such business promptly and reasonably. Persons at a distance can have their business done by correspondence—without the necessity of visiting this city or Washington. Office No. 94 Merchants Exchange, Wall st., corner of Hanover st., up stairs. 1y3

AMERICAN RAILROAD JOURNAL.

STEAM NAVIGATION, COMMERCE, MINING, MANUFACTURES.

HENRY V. POOR, Editor.

ESTABLISHED 1831.

PUBLISHED WEEKLY, AT No. 136 NASSAU ST., NEW YORK, AT FIVE DOLLARS PER ANNUM IN ADVANCE.

SECOND QUARTO SERIES, VOL. VI., No. 42!

SATURDAY, OCTOBER 19, 1850

[WHOLE No. 757, VOL. XXIII.]

ASSISTANT EDITORS,

J. T. HODGE, *For Mining and Metallurgy.*

GEN. CHAS. T. JAMES, *For Manufactures and the Mechanic Arts.*

M. BUTT HAWSON, C. E., *For Civil Engineering.*

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American Railroad Journal.

PUBLISHED BY J. H. SCHULTZ & Co., 136 NASSAU ST.

Saturday, October 19, 1850.

Indiana.

Terre Haute and Indianapolis Railroad.

The trade of the Mississippi valley is an object of the warmest rivalry between the cities of New York, Philadelphia, and Baltimore, and these cities are now intent upon the completion of the great lines of railroad, by which each hopes to secure the prize. New York expects to gain it by connecting herself with the great lakes; Philadelphia and Baltimore by connecting themselves with the Ohio. After these points are reached, each hopes, by connecting with the local lines of the west, to draw to itself a large portion at least of the trade of the great valley. Each city, too, hopes to constitute its own, the great trunk line for travel between the East and the Mississippi river.

These great lines of railroad have a common interest in the progress of railroads in the West, as these are to constitute their feeders. These lines,

too, though they diverge after leaving their eastern termini, approach each other on reaching the Mississippi valley, and will be best accommodated by running into each other, in the western or central part of Ohio, and following the same line to the Mississippi. This fact gives an increased importance to that portion of the line where all the above interests become identical. This has given a great impulse to the Bellefontaine and Indianapolis railroad in Ohio, the Indianapolis and Bellefontaine, and the Terre Haute and Indianapolis railroads in Indiana. Upon the last named road the work of graduation is nearly completed, and the whole line will be in readiness to receive the iron early in the Spring. We understand that the president of this road, Chas. Rose, Esq., of Terre Haute, is now in this city for the purpose of negotiating for its purchase. The work on this road has been pushed with energy, and everything which precedes the iron will be provided for by means of the people on its line. The road will traverse one of the best parts of Indiana, and will enjoy a good local, in addition to its prospective through travel. We know of no road in the West which is in better hands, and none which is more deserving of credit and encouragement, from the people of the East. For many years, at least, if not for all time, it must constitute a part of the great line between St. Louis and the East, and its construction is as much demanded by the wants of our business men as by those of the inhabitants on its line.

Improvement of the Navigation of the Ohio River.

The improvement of the navigation of this river by increasing the flow of water at times of drought, and in that part of the season when the water is lowest, is now attracting much attention. The public is indebted chiefly to Mr. Charles Ellet, Jr., for the plan that is proposed to effect this object, and for such evidence as has been presented of its practicability. The plan is to create reservoirs by draining the rivers that form the Ohio, or their tributaries, which shall hold sufficient water to maintain at all times an uniform flow of the depth of 3 feet on the shoalest places in the river.

Below we give a portion of the report of the committee of the Senate, to whom was referred the memorial of Mr. Ellet, praying the action of the general government in this matter, in which the plan is given in detail. There certainly seems to be no

insurmountable obstacle in the way, and if the improvement can be effected at anything like the estimated cost, steps should be taken towards its execution. The practicability of the scheme can easily be determined, and from the great importance of the improvement, we are glad to see that the general government has made an appropriation sufficient for an immediate survey.

Below we give such portions of the report referred to as will give our readers a good idea of the scheme.

The physical questions which arise in deciding on the practicability or propriety of adopting this plan, are:

First, what is actually the quantity of water which it would be necessary to supply per hour, or per diem, to maintain the navigation at any given height during the ordinary droughts of summer? and,

Secondly, where can this water be collected and stored in sufficient volume to secure a full supply during the 60 or 80 days of low water which frequently occur during the summer months?

On the first of these points the testimony offered by the memorialist is, in the view of the committee, most ample and satisfactory. He submits, on this subject, a printed memoir of his own, recently published as a part of the transactions of the Smithsonian Institution, in which are exhibited the details of numerous observations and measurements made by himself from actual survey, on the discharge of the Ohio river over the bar at Wheeling, in almost every navigable condition of the stream. The facts obtained from these measurements he has carefully applied to authentic records of the daily height of the water in the channel at Wheeling, so as to determine the number of cubic feet which flowed past that point, day by day, through a period of six consecutive years.

The results of this inquiry demonstrate that the volume of water which is annually discharged by the river would be sufficient if it passed off uniformly, to maintain a constant depth of nine feet on the Wheeling bar. The fact is thus established that there is abundance of water supplied by nature to secure a permanent navigation on this river, if it be in the power of man to control, or only partially to control, and regulate its discharge. But a depth of nine feet is not at all necessary for the present wants of the navigation. If a depth of only three feet can be permanently secured by this process, it will, in the opinion of your committee, diffuse wider and greater benefits over a large portion of the west than any other work of public improvement which has ever been suggested. The attention of the committee was therefore earnestly directed to that point. A depth of three feet is sufficient for the movement of boats of 100 or even 150 tons and that depth, constantly maintained in the

Ohio, would effectually protect the country against exorbitant freights, and any serious obstruction of travel.

The committee learn, from the observations made by Mr. Ellet at Wheeling, that when there is a depth of three feet on the bar at that place, the river discharges a daily volume of four hundred millions of cubic feet. But they also find, on the authority of the same measurements, that about one-half of this quantity is actually supplied by the natural flow of the river during the ordinary low water of summer, for it very rarely happens that the depth falls below 23 inches at Wheeling; and when there are 23 inches on the bar, there are, in round numbers, 200,000,000 of cubic feet flowing over the bar in every 24 hours.

The difference between the discharge of the river when the depth is 23 inches and the discharge when it is 36 inches, is thus found, by careful gauging on the spot, to be 200,000,000 cubic feet per diem. This is, therefore, the volume which must be drawn from the artificial store in order to maintain the navigation for one day so as to permit the passage of boats of three feet draught; and to uphold this depth for one week, there must be provided not less than 1,400,000,000 cubic feet. The problem, therefore, seems to be reduced to the simple determination of the dimensions of a reservoir capable of furnishing this quantity of water at the head of the Ohio, and the possibility of finding space in the upper valleys for the creation of such reservoirs.

But it is known that a reservoir only one mile square and 50 feet deep will hold nearly 1,400,000,000 cubic feet of water, and will be capable, therefore, of maintaining a depth of three feet in the Ohio during a period of seven days.

Now, the committee cannot doubt, from their own knowledge of the mountains and valleys of this country, that it is perfectly practicable to form reservoirs that will contain a volume equal to one mile square and fifty feet deep.

The descent of the Alleghany river, along a considerable portion of its course, is about two feet per mile.

It is obvious, therefore, that a dam 50 feet high on that stream would create a pond or lake 25 miles long, of which the average depth would be 25 feet, and the average width certainly one fourth of a mile. Such a reservoir will contain 4,000,000,000 cubic feet, or three times as much water as has been found to be necessary to support a navigation of three feet for a period of seven days. In fact, such a lake would suffice to keep up a depth of 3 feet during a space of three weeks together—allowing nothing for the contents of the lateral branches which the lake would form in this space of 25 miles.

The committee deem it unnecessary to comment upon the practicability of constructing such dams as will be essential for the success of this plan, or to speculate upon their security or probable durability. The Lehigh Navigation company alone have erected no less than 28 dams for the accommodation of a portion of the anthracite coal trade of Pennsylvania, and many of these dams are over 30 feet, some over 40, and one 58 feet in height. High dams and long pools or great reservoirs are to be found also on the Schuylkill, the Susquehanna, Potomac, and James rivers, and many others on the rivers of Kentucky, Ohio and Indiana.

Mr. Ellet estimates the cost of erecting such works as will give a minimum flow of three feet at \$250,000, and of four feet at \$500,000. If it could be realised at a cost exceeding his estimate ten times, but little difficulty would be found in obtaining the money from private sources alone.

In relation to the progress of the commerce of the west the report says:

The progress and value of the steam navigation of the rivers and of the Mississippi valley is indicated, in some degree, by the number of boats now plying, and the number that is annually built. The statistics on this interesting subject are imperfect; yet facts enough are known for the general conclusion which we wish to draw in this report. Steam navigation may be regarded as successfully begun on the Ohio in the year 1817; and the number of steamboats in use on all the western

waters at various periods, from that date down to the present time, appears to have been as follows:

In 1817 there were in use about 14 steamboats.	
In 1829 " " "	200 "
In 1834 " " "	230 "
In 1842 " " "	450 "
In 1843 " " "	600 "
In 1848 " " "	1200 "

From the rate of increase exhibited in this list, the number of boats now running on all the waters of the Mississippi must be at least fourteen hundred; but in 1843, according to the authority of James Hall, in his work on the commerce of the west, from which these facts are taken, the steamboat tonnage of the Mississippi valley alone was 50 per cent. greater than the total steamboat tonnage of the whole British empire. But the tonnage of the western waters is now nearly two and a half times as great as it was in 1843, and probably greater than the total steamboat tonnage of all other parts of the world.

In 1842 the value of the commerce of the west was estimated by a committee of the Senate, on the most authentic data that could then be obtained, at \$220,000,000 per annum. In 1848 it was estimated in the work already quoted, at \$450,000,000;—and if the same rate of increase has prevailed up to the present time, as that which has taken place between 1842 and 1848, the present value of the commerce which floats on the Mississippi and its tributaries cannot be less than \$530,000,000 annually.

Our limits will permit us to give only such part of the report as presents the scheme, with the above data of the commerce of the Ohio and the West. It is a subject not only of great scientific interest, but vastly important in its bearing upon the commerce of the country. It certainly possesses merit sufficient, even upon the slight evidence thus far presented, to warrant a thorough investigation at the expense of the general government.

Iron as a Material for Ship Building.

In an address, explanatory of an improved method of sheathing, to prevent fouling and corrosion, delivered at the Liverpool Polytechnic Society, by Mr. Grantham, he stated that he had first introduced the subject of iron ship building to the Society in 1842; that since that time a great number of vessels, of all sizes, had been built; but that no effectual alteration in the mode of construction had been employed. Indeed, eight years of additional experience had only confirmed the general principles which he then advanced. Nearly all that he had stated, respecting the superiority of iron ships, had been more than realised; and the public had become so well satisfied on these points that it would be only waste of time to reconsider them. As, however, nothing is perfect, so in iron ships disadvantages had been felt, and he would name the only two of which he was sensible—the first, although a subject of interest, did not affect the mercantile marine, he alluded to the recent experiments made at Plymouth by Captain Chass, of the *Excellent*. From these it was proved that iron vessels, as at present constructed, would not answer for war purposes. The second disadvantage resulted from causes which it was his wish to obviate, and for which he had projected the plan now submitted to the society. He felt, however, that great caution was necessary in giving to the world any new plans. His experience had shown him that gradual and slow advances in practical science were the surest; but in cases, like that now before them, where there existed an acknowledged defect, that obstructed this progress, every effort should be made to remove it. His plans offered little if any advantage for purposes to which iron vessels had been, as yet, generally applied, but he thought if they were introduced they might serve to increase the use of iron ships in situations where they had not yet been employed. The present mode of constructing iron ships for ordinary purposes was as good as could be desired, and he could not suggest any material improvement. Engineers, who were the principal parties to introduce iron ships, were a long time assailed by ship builders; but he was glad to see even this opposition relaxing. Every day more iron was introduced into the construction

of even timber vessels—some parties were going so far as to make the frames entirely of iron; these he would recommend to go one step further, and to cover the ribs with iron plates; they would then have a sound ship. Some again proposed to make the sides of iron plates and the bottoms of wood; these he would likewise recommend to go a step further, and make the bottom also of iron. It was quite astonishing how parties overlooked the fact, that it was the plates which gave to an iron ship its great strength; the frames seldom possessed the firmness of those made of oak for a timber vessel, from which it might be inferred that if any part was to be dispensed with or substituted by timber it should be the ribs and not the plates. In building iron ships, England possesses advantages over other countries which, perhaps, might obviate some of the loss anticipated from the repeal of the Navigation Laws, and he (Mr. Grantham) would read a few appropriate remarks on the subject:—In our struggle with America for pre-eminence in steaming, the difference of an iron and wooden hull would alone decide the question. Suppose the *Asia* had been built of iron instead of wood, with perhaps 500 tons less weight of materials in her construction, where would she have stood in the Atlantic? The government have indeed lately objected to the use of iron for vessels carrying the mails, because they are not suitable for war purposes. The absurdity of this will be seen, when it is recollected that all the vessels thus employed are unfit for close action, having nearly half the machinery above the water line. Why then make any restrictions on this important point, while the engines in the wooden ship unfit them from receiving a shot to a much greater extent than from any bad result to be expected from the iron hull. Before recurring to the subject of his address, he would make another observation on the general question of iron ships. In a paper he had read before the society some years ago, he had foretold that the employment of the screw and the use of iron vessels for foreign trades would go forward simultaneously, and who that is watching the course of events but can see the progressive fulfilment of this prediction? There is no quarter of the globe where iron screw steamers will not be found—yes, the iron sailing ship too, if only we can obviate the only difficulty attaching to iron ships on foreign stations—viz., the *fouling*. He had been connected with iron ship building for nearly twenty-five years, and had repeatedly heard of plans for removing this objection, but hitherto he had not seen one that had obtained permanent reputation, and the objection to iron ships for trades where they could not be docked, still existed—the principal merit claimed for such plans as had been given to the world implied a character of *short duration*.—One reason why copper itself is available for the purpose required is its oxidation in salt water, causing it continually to throw off the animalcule that adhere to it. Sir Humphrey thought he had done a great service to shipowners by devising a plan for preventing this loss to copper by stopping the oxidation—and what followed? the copper became as foul as any other material would have been, and so defeated the object for which it was applied to the ship.

Mr. Grantham then exhibited some plans and models to explain the method he proposed to adopt. It had long been considered desirable to sheath an iron ship with wood, so as to admit of copper being used for sheathing, but as this plan seemed to require bolts to secure the wood to the iron, a system which would be injurious to the ship, all attempts had been considered fruitless. He had, however, succeeded in doing this by simply placing the ribs of the vessel on the outside instead of on the inside—these ribs were of such a form that timber of any required thickness could be dove-tailed into them. Over these was nailed a thin sheathing of wood, and then copper in the usual way—the iron would be effectually preserved from all the copper by the former being well painted, and by coats of marine glue, or other non-conducting substances, placed between the timber. The cost of the vessel thus built would not exceed that of the old plan, except that the copper would be additional.

Mr. Grantham also explained the plan of a portable hot air apparatus for drying the bottoms of iron vessels previous to painting or sheathing. In

the course of his remarks, Mr. Grantham alluded to objections which would probably be made against his plan. One was, whether the copper would not have a bad effect on the iron from the galvanic process; but this he showed would be impossible, from the complete separation of the two metals. The next objection was the question of corrosion, which he also had provided against. The meeting, which was very numerously attended, manifested great interest in the observations and explanations offered by Mr. Grantham, and the lecturer clearly carried along with him the convictions of his intelligent audience. At the close of his address Mr. Grantham received the thanks of the assembly for the ability displayed in his remarks.—*Min. Jour.*

Internal Improvements in the State of New York.

A Sketch of the Rise, Progress and Present Condition of Internal Improvements in the State of New York.

NUMBER I.

Continued from page 644.

After the passage of the law for commencing the canals, Col. Young and Mr. Holley, were designated as acting commissioners, and arrangements were made for dividing the route between the Mohawk and Seneca rivers into sections for the contractors. The first contract was made on the 27th of June, and on the 4th of July, 1817, Col. Young and Mr. Holley joined the citizens of Rome in celebrating the 4th of July by breaking ground at that place for the construction of the Erie canal. Col. Young made the following address on the occasion.

"Fellow citizens! We have assembled to commence the excavation of the Erie canal. The work, when accomplished, will connect our western inland seas with the Atlantic ocean. It will diffuse the benefits of internal navigation over a surface of vast extent, blessed with a salubrious climate and luxurious soil, embracing a tract of country capable of sustaining more human beings than were ever accommodated by any work of the kind.

"By this great highway, unborn millions will easily transport their surplus productions to the shores of the Atlantic, procure their supplies, and hold a useful and profitable intercourse with all the maritime nations of the earth.

"The expense and labor of this great undertaking bears no proportion to its utility. Nature has kindly afforded every facility; we have all the moral and physical means within our reach and control. Let us then proceed to the work, animated by the prospect of its speedy accomplishment, and cheered by the anticipated benedictions of a grateful posterity." The contractors then commenced the excavation.

In the latter part of the year 1816, the canal commissioners, by their president, Mr. Clinton, made another application to Congress for aid, and also to the States of Ohio, Kentucky and Vermont.—The governor and legislature of Ohio responded to the application in the most friendly manner, but it soon became apparent that the construction of the canal would rest on the energy and resources of New York alone.

The same year that the bill passed for commencing the canals, DeWitt Clinton was chosen governor, in the place of Gov. Tompkins, who had been elected vice-president on the ticket with Mr. Monroe. Mr. Clinton continued in the office of governor until December, 1822, and in each of his annual messages congratulated the legislature on the progress of the several sections, and urged unabated perseverance until the whole of the great work was accomplished.

At the session of 1818, an act was passed "to improve the funds, and to provide for the redemption of the funded debt of this State." This act authorized the comptroller to borrow a million of dollars, and prescribed the form of certificates to be issued for canal stock, provided for establishing an agency in New York, for making transfers, and authorized the governor to appoint an officer of a bank to sign the certificates of State stock. It also gave authority to banks to become bidders for the loan, and the 16th section provided, "that if any bank in the city of New York shall make the loan of one million of dollars, on terms more advantageous to the State than it can otherwise be obtained, on condition that a part or the whole of the treasury depos-

its collected in the city of New York shall be transferred to such bank, it shall be lawful for the comptroller, with the advice of the governor, to direct the said deposits to be made in such bank." The Manhattan company took the loan, and thus obtained the deposits. Gov. Clinton appointed the cashire of the bank agent to sign certificates of stock, and in this way that bank became the agent for transferring State stock, which agency has continued to the present day. The mode of signing certificates, however, has been changed, and they now bear the seal and signature of the comptroller, and are countersigned by the cashire or president.

Mr. Bacon, of Oneida, was chairman of the joint committee on internal improvements in 1819, and on the 22d of February made a report, carrying out the recommendations of the canal commissioners. The act passed at this session "concerning the Western and Northern canals," added \$200,000 to the sum to be borrowed annually; authorized the extension of the Erie canal from Seneca river to Lake Erie, and from the eastern termination of the middle section to the Hudson; the construction of a side cut at Salina; and the completion of the Champlain canal; and exempted the laborers on the canals from military duty, on certificates of a canal commissioner or contractor. The commissioners were authorized to establish reasonable tolls on the canals, and adopt necessary measures for the collection and payment thereof to the fund commissioners.

This act encountered a strenuous opposition in the Senate. Motions were made to strike out the provision for completing the western section, and then the eastern, which failed by a vote of 16 to 12. William L. Stone, in a statement appended to Dr. Hosack's memoir, page 456, says: "I believe it may be truly said of Mr. Van Buren and Col. Young, that it was to their unwearied exertions mainly, that the attempts made at this time to cripple the bill were defeated."

A concurrent resolution passed at this session, to survey the Oswego and Seneca rivers, and the outlet of the Onondaga lake, in reference to improving the navigation of those streams.

At this session, Henry Seymour was appointed a canal commissioner in place of Joseph Ellicott, resigned.

The commissioners, in their report of 1820, announce the discovery of water-proof lime, in the progress of their excavations, in the counties of Madison, Onondaga, Cayuga, Ontario and Genesee, and they say, "it will doubtless hereafter be considered as an article of prime necessity throughout our country, for all hydraulic masonry." This prediction has been fully realized. Water-lime of a superior quality, was also found in constructing the Delaware and Hudson canal. In this report it is stated that the Salina side-cut is completed at an expense of \$6,044, making with the middle section, 96 miles of artificial navigation completed, at an average cost of \$11,793 per mile. Also that the commissioners have decided to put 63 miles of the western, and 26 of the eastern section, under contract.

George Huntington, of Oneida, was chairman of the canal committee in 1820. On a reference of a resolution of the Assembly, in regard to the local tax, and another on the subject of "delaying the construction of a canal west of Seneca river, until the Northern canal, and the Western canal from Utica to the Hudson, be completed," he addressed a note to the canal commissioners, who answered it by a general review of the arguments in favor of the Erie canal, and this answer was embodied in the report of the committee. The conclusion was adverse to the collection of the tax within 25 miles of the canal, and in favor of the completion, without delay, of the entire canal to Lake Erie.

An act was passed at this session, suspending the tax of \$1 on each passenger in steamboats on the Hudson, and imposing a tax of \$5 000 annually on the "North River Steamboat Company." From 1817 to 1819, the tax of one dollar for each passenger yielded a revenue of \$51,800, or \$17,266 for each year; the latter sum showing the average number of steamboat passengers for each navigation season, for the three years preceding 1820.—The lands in the salt springs reservation, not required for the manufacture of salt, were granted to the canal fund, with a reservation that the legisla-

ture might apply any portion thereof for the improvement of the Oswego river, and the sum of \$25,000 was then appropriated to this object. The lands belonging to the State on Grand Island, seventeen thousand three hundred and eighty acres, were appropriated to the Erie and Champlain canal fund. At the same session, an act of 23 sections was passed, "for the protection and maintenance of the Erie and Champlain canals, and the works connected therewith."

In June, 1820, the persons selected by the justices of the Supreme Court to estimate the damages of vesting in the people of the State the lands, waters, canals, locks, and feeders, belonging to the Western Inland Lock Navigation company, made their award as follows: "To the individual stockholders, proprietors of stock amounting to \$140,000, the sum of \$91,616; and for the use of the people of this State, proprietors of \$92,000, the sum of \$60,204 80." The appraisers were Richard Varick, Nathaniel W. Howell, William W. Woolsey, O. German and Elisha Jenkins. The award was confirmed by the Supreme Court.

Mr. Dudley, chairman of the committee on canals in the Senate, reported a bill at the fall session of 1820 for borrowing one million of dollars for each of the years 1821 and 1822, in addition to the annual sum of \$600,000 previously authorized. In 1821 this bill became a law. It passed the Senate by a vote of 23 to 6, and the Assembly almost by a unanimous vote.

At the same session, Mr. McIntyre, then comptroller, made a report, in obedience to a joint resolution of April, 1820, presenting a plan of a sinking fund for the payment of the canal debt, and estimates of the annual revenues from various sources. In this estimate it was stated that the canal tolls, "over and above the necessary provision for repairs, will produce annually at least \$150,000."—This was a low estimate, even at that time, taken in connection with the fact that as early as 1812, the canal commissioners had estimated the gross amount of tolls at a million of dollars annually.

In their annual report in 1821, the canal commissioners furnished a list of the rates of toll on the canals. These rates were those referred to in the constitution of 1821, and fixed as the minimum charges. Flour, meal, and all kinds of grain, salted provisions, and pot and pearl ashes, were put at one cent per mile for a gross ton; and merchandise at two cents per mile. Flour, wheat, salted provisions, butter, cheese, lard, etc., are now charged at 4 mills per 1000 pounds per mile; corn, cornmeal, cotton, lime, cattle, hay, bran and ship stuffs, at 2 mills; and hemp, manufactured tobacco, potatoes, apples, etc., at one mill per thousand pounds per mile.

The sum collected on the middle section for tolls, from the 1st of July, 1820, to the close of navigation, is given at \$5,244 34.

William C. Bouck was chosen a canal commissioner by the legislature of 1821.

Previous to 1821, the acting canal commissioners were paid a salary of \$2,000, and their travelling expenses; in that year their salaries were fixed at \$2,500, in lieu of all expenses. The non-acting commissioners, at that time, served without compensation, except the payment of their travelling expenses.

In his annual speech of 1822, Gov. Clinton alludes to the annual surplus of the canal fund, beyond the payment of interest on the debt, and says it "ought to be appropriated to the extinguishment of principal; and as this excess will increase with the progress of time, and the extension of inland trade, there cannot be a doubt, not only as to the rapid discharge of the debt, but as to the creation of an increased revenue, applicable to all the purposes of beneficial improvement, and all the objects of good government."

The commissioners, in their annual report, refer to the obstacles to be overcome at the mountain ridge. The deep cut is stated to be seven miles in length, averaging from twelve to thirty feet in depth—for three miles from the locks west, the cutting principally was through limestone. The elevation at the mountain ridge, above the Genesee level, is stated at sixty feet, requiring five locks. The plan of combined locks was adopted, and two sets were constructed. In this report the commissioners confirm their former opinion, in favor of terminating

the Erie canal at Buffalo creek. The tolls collected on the middle section in 1821 were stated at \$23,001 63, and on the Champlain canal at \$1,386 84.

An act was passed at this session to encourage the construction of harbors at Buffalo creek and Black Rock, and for extending the Salina side cut to Onondaga lake; and to exempt from execution all materials procured by contractors for the Erie and Champlain canals.

Judge Yates was chosen governor, and entered on the duties of his office in January, 1823. As a member of the Council of Revision, he had been a uniform supporter of the canal policy, and when the act of 1817 came before that body, Judge Yates gave the bill his decided support. His messages, as governor, in 1823 and 1824, contained favorable notices of the canals. The tolls are reported for 1822, on both canals, at \$64,072 33. The legislature, in 1823, authorized \$1,300,000 to be borrowed on account of the canals. Motions to collect the tax within twenty five miles of the canals were negatived, in both houses, by decided majorities.

James Lynch, of Oneida, was chairman of the canal committee, and introduced a bill, on the memorial of Peter B. Porter, to extend, for one year, the act of 1822, in regard to harbors at the western termination of the Erie canal, which became a law. He also introduced a bill defining the duties of canal commissioners, and several other bills relating to the canals.

The convention of 1821, for amending the constitution, adopted an article to prevent the diversion of any portion of the canal fund, or a reduction of toll below the rates fixed in 1821, until the final extinguishment of the Erie and Champlain canal debt. This provision took effect from the last day of December, 1822; and it was effectual as to the old debt; but there was no prohibition against creating new debts, and before the stock issued for the Erie and Champlain canals was cancelled, a much larger amount of debt had been created by stock loaned to railroads, and issued on account of new canals.

William L. Marcy was appointed comptroller by the legislature of 1823, in place of John Savage, who was appointed a Justice of the Supreme Court. —*Merchants' Magazine.*

To be continued

On Malleable Iron and the Strength of Railway Axles

Mr. G. B. Thornycroft, of the Schrubbery Iron Works, Wolverhampton, some time since read a communication at the Institution of Civil Engineers, "On the Manufacture of Malleable Iron, with the Results of Experiments on the Strength of Railway Axles," which was noticed in the Mining Journal of the 30th March: we have since received a copy of the paper, with diagrams, and from which we make the following extracts:—

"Malleable iron may be divided into two distinct classes—'red short' and 'cold short'; the former being generally produced from the rich ores, and the latter from the poorer, or leaner ones. The pig iron made from the rich ores (under the cold blast process only) is not so fluid as that from the lean ores; when, however, it has been converted into malleable iron, it is tough and fibrous when cold, but is troublesome and difficult to be worked by the smiths, at less than a white heat; this want of ductility has caused it to be denominated 'red short.' The pig iron produced from the lean ores possesses, on the contrary, more fluidity, and it is thence well adapted for small castings, but when it is manufactured into malleable iron, although in the hands of the smith it is ductile and easily worked, even at a dark red heat, it becomes, when cold, weak and unfitted to support sudden shocks, or continued strains, and is hence called 'cold short.' It is obvious, that to obtain qualities of iron suitable for the various purposes to which it is now applied, a judicious mixture of these two kinds must be made; but even this will not suffice, unless the pig iron, forming the basis, be of a proper quality. It may be received as an axiom, that good malleable iron can only be made from good dark, and bright grey pig iron smelted from iron ore alone, or with a very small admixture of any extraneous substance. Iron made from white pig iron, is never ductile, although it may be cold short, whilst it differs materially from red short iron, made from rich

ores; in fact, it possesses no good quality, either hot or cold, and may be termed 'rotten short.' The quality of the fuel used in the smelting furnace and in the subsequent processes, is very important for the produce of the best ores may be rendered utterly worthless, by the use of inferior fuel; on the other hand, iron made from rich ores, and having great strength when cold, but which cracks in working at a red heat, if smelted with very pure coal, or charcoal, retains all its strength, whilst it becomes much more ductile than if an inferior quality of fuel had been used. Hence, when a strong ductile iron is required, the best fuel must be employed in its manufacture. The introduction of hot blast for smelting iron rendered necessary a careful investigation into the comparative use of hot and of cold blast pig iron, in the manufacture of bars; the result of this would appear to indicate, that if the same quality of materials be used in both cases, equally good bar iron will be produced; but it is more difficult to convert the hot blast pig iron into 'No. 1' bars, and the waste is greater than when coal blast iron is used.

Malleable iron becomes granular from causes; first, in consequence of being made from naturally cold short pig iron; and secondly, from a peculiar manipulation during the process of 'puddling.' If the iron be made up into balls as soon as the granulated particles will stick together, or as the workmen term it 'put together young, before it has got into nature,' the texture will be fine, and close-grained, and the fracture will present a bright granular appearance; such iron will not, however, bear sudden impact, nor will it become fibrous in texture, by working, until it is reduced to very small bars, or into plate iron. All granular iron is much harder when cold, and will endure longer, than fibrous iron, although it is not so well adapted for general purposes. It is easy to give a fibrous fracture to iron, by welding the 'pile' or 'fag-got' at a low heat, so that the interior does not become thoroughly solid; but if a pile be subjected to a sufficient degree of heat to make it perfectly sound, and the iron present a fibrous fracture throughout when reduced to 1½ inch square, or round bars, the quality must be very good.

Railway axles should be made parallel from journal to journal, and of sufficient strength to prevent any vibration in rotating. If this general rule were adopted there would not be any change in texture, and consequently a less number of fractures would occur. If it be considered necessary to reduce the substance of the middle of an axle, it would be safer to use good granular iron at first, as it is naturally much stiffer, and less liable to bend and vibrate, than fibrous iron, and would probably not change its form so soon, or receive injury, whilst working under ordinary circumstances. It is, however, the author's opinion, that axles should be perfectly rigid, so as not to bend, or vibrate, even if that should have to be accomplished by making them somewhat larger in the centre, like the connecting rod of an engine.

Many other causes of change could be adduced, but enough has been stated to prove, that the compression of iron, when cold, is certain to change fibrous into granular iron, and that vibration, or bending, even to a slight extent, if continued for any length of time, has the effect of compressing all the particles consecutively. A series of experiments was carefully made, for the purpose of ascertaining, practically, the best form for railway axles, so as to obtain the greatest strength with a given weight of material. From these experiments it would appear, that the forms generally adopted are very erroneous, especially in reducing the substance of the middle of the axles, and in turning rectangular shoulders near to the journals.

The first was an experiment to determine the best position for placing the wheel on the axle, so that the journal may possess the greatest amount of strength for resisting the forces tending to break it. One end of the axle was firmly keyed into a strong frame of cast iron, the neck of the journal being in a line with the front of the frame, it was then subjected to the impact of a heavy ram, falling a distance of 9 feet, vertically to the plane of that part of the axle which was struck; the force of impact of each blow being equal to five tons, and the whole amount of impact equaling 30 tons; in this case the end broke off at the

sixth blow. The other end of the axle was then keyed into the frame, with the neck of the journal projecting 1½ of an inch, beyond the front of the frame, on being subjected to five blows of the ram about the middle of the journal, near the end, under the same conditions as before, this end did not break off until the 20th blow, the total amount of impact being 100 tons; thus proving, that by simply moving the face of the wheel back from the neck of the journal, the strength to resist impact was increased in the ratio of 100 to 30.

The second was an experiment to determine the strength of an axle, having a shoulder behind the wheel, and one having no shoulder. In this case an axle 3½ inches in diameter at the centre, was cut in two, so that the quality of the iron might be the same in both experiments; one-half had a collar of 1½ of an inch left against the part intended to receive the nave of the wheel, which part was turned to 4½ inches diameter; the other had no collar, which was turned parallel towards the centre of the axle. The first half was then keyed into the frame, as in the other experiments, and impact to the amount of 55 tons was applied, when the end broke at the 11th blow of the ram, the face of the fracture being quite granular. The other end was next keyed into the frame, and impact to the amount of 155 tons was applied, when 31 blows were required to break it off, and the face of the fracture was perfectly fibrous throughout. These experiments prove that the relative strengths, to resist impact, where there is no shoulder, and where there is one, is in the ratio of 155 to 55.

The fourth was an experiment to determine the best form for the centre of an axle. In this experiment a parallel axle 4½ inches in diameter, was supported and subjected to impact at points corresponding to the position of the wheels, and after receiving 15 blows from the ram, the end was deflected 1½ inch from a straight line. The axle was then drawn down in the middle, to 3½ inches diameter, the opposite end being subjected to impact, under the same circumstances, and after the same number, of 15, blows of the ram, the deflection from the straight line was five inches; thus proving that the strength of a parallel axle compared with one which has been reduced in the middle, is in the proportion of 5 to 1½ inches. Again, it is well known, that the strength of round bars to resist transverse strain, is as the cubes of their diameters, which in the case above cited would give the parallel axle an advantage over the reduced axle in the proportion of 83.74 to 58.18; and as the same law obtains in reference to torsion, if the velocity is the same, the strength to resist torsion will be in like proportion.

Mr. Thornycroft concludes that with regard to the forms of railway axles, it appeared to him, from the experiments, that the nave of the wheel should not be placed close to, but at some little distance (say ½ of an inch) from the neck of the journal; also that the shoulder behind the wheel should be entirely done away with; and instead of reducing the diameter of the axle in the middle, it would be advisable rather to increase the bulk at that point, like the connecting rod of an engine. He had never heard of a single case in which the texture of a fractured parallel axle had been found changed from a fibrous to a granular character, although a certain amount of granulation had been repeatedly observed with axles which had been reduced in the middle, and had then been broken in course of regular working. It appeared in all such cases, as if there had been a progressive and alternate action of compression and extension of the outer fibres, from the bending of the axle, whilst it was rotating—and that thus the granular fracture had been produced."

It is no wonder that Mr. Thornycroft's paper should have created so great an interest in the scientific world, when there is found in it such a mass of valuable information, both for iron manufacturers and engineers in general. In one department of railway engineering there is ample proof given that the axles in general use on railways are not so strong by one-half as if they were made upon a truly philosophical principle, and which, we perceive, may be done by a very slight alteration of form, and without at all increasing the cost. It has long been considered that the vibration of an axle while rotating being arrested at the back of the

wheel was the simple cause of the change of the iron from fibrous to crystalline, and consequent fracture; but it appears evident, from some of Mr. Thornycroft's experiments and specimens, that simple vibration does not alter the texture of iron, and that the fracture on axles which have occurred at the back of the wheel is entirely due to the shoulder at that part; and that iron undergoes no change from the fibrous to the crystalline, except by compression; that whenever shafts or axles are made so small as to bend while rotating, compression of the outer fibres takes place, hence the crystalline annular ring observable in every fracture from this cause. Should, therefore, any accident arise on railways from an unphilosophical form of axle, and result in the loss of life or limb, with whom will the responsibility rest? for we should presume that the proper form of an axle was no longer a matter of opinion, but a matter of fact, sustained by numerous experiments, investigated, approved, and published by the highest engineering authority in the kingdom—viz: the Institution of Civil Engineers, London. We cannot close without referring to Mr. Thornycroft's practical explanations on the manufacture of iron, which must have been very interesting to all who have to deal with this important article, either in its manufacturing manipulations, or in its applications to those stupendous structures for which the engineering talent of the present day is so remarkable; and we may hope that the talented ironmaster may reap some solid advantage from his valuable scientific labors.—*Min. Jour.*

From the Journal of the Franklin Institute.

INVESTIGATION OF THE COMPARATIVE MERITS OF THE PERPENDICULAR AND RADIAL PADDLE WHEELS FOR SEA-GOING VESSELS. By B. F. Isherwood, Esq., Chief Engineer U. S. Navy.

Continued from page 645.

If now our data were exactly correct, and there were no loss of labor by the friction of the perpendicular paddle wheel, the final comparison would show, in each case, the powers to bear equal proportions to the cubes of their respective speeds; assuming the data to be correct, there will remain the loss by friction of the perpendicular paddle wheel included in the final comparison, which will then not show the powers to bear equal proportions to the cubes of the speeds, and the discrepancy is the measure of the power absorbed in the friction of the perpendicular paddle wheel.

Let us make these calculations, and first for the perpendicular paddle wheel of the "Black Eagle."

Speed of vessel per hour,
13.14 statute miles, or .69379-20 feet.
Speed of centre of reaction, 85954-18

Slip.....16574-98 "or 19.3 p. c.

Loss by reaction, calculated as before described, between the surface of the water and a horizontal line tangential to the lowest point of the rolling circle, (the circumference of which circle multiplied by the number of revolutions of the paddle wheel equals the speed of the vessel,) is 6.7 per cent. of the total power.

The power required to work the engine, overcome load or air pump, &c., may be taken at 2 lbs. per square inch of steam piston, or, in round numbers, at 12 per cent., the mean effective pressure on the steam piston being 17 lbs. per square inch.

The power required to overcome the friction of the load on the engine, according to the best experiments, is 10 per cent. We then, for the disposition of the power with the "Black Eagle," have the following:

	Per cent actual horses pow'r.
Slip of the centre of reaction of the paddles.....	19.3 or 128-345
Reaction of water on the paddle..	6.7 or 44-555
Working engine, &c., &c.....	12.0 or 79-800
Overcoming friction of load.....	10.0 or 66-500
Utilized in propelling vessel, including amount absorbed in friction of working parts of wheel..	52.0 or 345-800
Totals.....	100.0 665-000

The disposition of power with the "Trident" being calculated as follows, viz, the slip as the difference of speed between the centre of reaction of the paddle and the velocity of the vessel, and the loss by oblique action as the squares of the sines of the angles under which the paddle presses the water, from the surface of the water to a perpendicular position, and the mean taken; and the same allowance for working the engine, overcoming friction of load, &c., being made as for the "Black Eagle," we have:

	Per cent actual horses pow'r.
Slip of the centre of reaction of the paddle.....	22 or 196-02
Oblique action of the paddles.....	8 or 71-28
Working engine, &c., &c.....	12 or 106-02
Overcoming friction of load.....	10 or 89-10
Utilized in propelling vessel.....	48 or 427-68
Totals.....	100 891-00

The co-efficients of resistance for the hulls will be obtained as follows: The vessels having about the same proportions between length and beam, their resistances (that is, the relative resistances of their models) may be considered as their displacements and immersed amidship sections. That this proportion gives the relative resistances of the vessels in function of model (not absolute resistances is easily proven.

Suppose two vessels with the same proportions between length, breadth, and depth, and having the same models, but the immersed amidship section of one is 100 square feet, and its displacement 500 tons; the immersed amidship section of the other is 300 square feet, and as the models are alike, its displacement will have the same proportion to the displacement of the other as its immersed section has to the immersed section of the other: that is, as 3 to 1. The comparison of the relative resistances of these vessels in function of model will then be thus: 10 : 500 :: 300 : 1500, and $100 \times 1500 = 500 \times 300$; that is, the resistances in function of model are the same, and the immersed amidship sections being as 3 to one, the absolute resistance will be in the same proportion; because the immersed amidship sections represent the quantities of water moved, and the relative resistance in function of model, represent the resistance of that water to being moved.

Applying this to the "Black Eagle" and "Trident," we have:

$$600 : 200 :: 900 : 252, \text{ and } 600 \times 252 : 900 \times 200 :: 1 : 0.75$$

To obtain the absolute resistances of the vessels, the above resistances in function of model must be multiplied by their respective immersed amidship sections. This product represents relatively the proportions of power required to propel the vessels at equal speed. The immersed amidship section of the "Black Eagle" is 200 square feet, of the "Trident" 252 square feet; and $200 : 252 :: 1 : 1.26$, and $1.26 \times 1.19 = 1.50$, and $100 \times 1.50 = 150$; that is, the absolute resistance of the "Black Eagle," comparatively to that of the "Trident," is as 1:00 to 1:50.

To return now to our calculations, we find that the number of actual horses power required to propel the "Black Eagle," (including the amount absorbed in friction of the working parts of the wheel) was 345.80, and the number of actual horses power required to propel the "Trident" was 427.68; and multiplying these powers by the co-efficients of the resistances of the vessels inversely, we have—

$$345.80 \times 1.50 = 518.70 \text{ or } 1.0000 \\ \text{and } 427.68 \times 1.00 = 427.68 \text{ or } 0.8245$$

These last numbers represent the powers proportionally to the resistances they overcome. But they overcome these resistances at different speeds, viz, the "Black Eagle" at 13.14 statute miles per hour. Now powers compare as the cubes of the speeds of the resistances they overcome, $13.14 : 11.93 :: 1 : 0.6766$. We have, therefore, for the final comparison,

	"Black Eagle."	"Trident."
Powers.....	1.000	0.8145
Effects.....	1.000	0.7466
And 62.45 : 74.66 :: 1 : 0.9055.		

That is to say, the result of the application of the power of the "Black Eagle" is better in the proportion of 1:0000 to 0:9055 than in the "Trident," according to the calculation, and the calculation includes as utilized power, in the "Black Eagle," the power necessarily absorbed by the friction of its perpendicular wheel. But as allowance for the different resistances of the hulls has been made, the discrepancy in the calculation is produced by, and is equal to, the power absorbed in this friction, and this discrepancy is $1.0000 - 0.9055 = 0.0945$, and 0.0945 is 9.45 per cent of the total power, 1.0000, of the "Black Eagle;" 9.95 per cent of the total power is, therefore, the loss by friction of the perpendicular paddle wheel of the "Black Eagle."

Assuming this to be correct, let us see if it will give the same result, making the comparison in another manner, viz, by per cents, utilized of the total power. Taking the total power in each case as unity, or 100.00, we have for the "Black Eagle" the following losses, viz, by slip 19.3, reaction 6.7, working engine, 12, friction of load 10, and friction of wheel 9.5; total 57.50, which, deducted from 100.00, leaves 42.50 per cent utilized. With the "Trident" we have the following losses, viz, slip 22, oblique action 8, working engine 12, and friction of load 10; total 52, which, deducted from 100, leaves 48 per cent utilized, and $48 : 42.5 :: 1 : 0.8854$, or nearly the same proportion as before, which were 1:0000 : 0.9055. The calculation may, therefore, be considered as nearly correct.

It will be observed that the per cents of power utilized in the "Black Eagle" were only 42.5, while in the "Trident" they amounted to 48; but the paddles of the "Trident" were only *awash*; that is, having the upper edge coinciding with the surface of the water, an arrangement not practicable for a sea going vessel. Supposing the paddle of the "Trident" to have had a sea-going immersion; that is, about 4-10th of the radius of the wheel, and to have had such a surface as to have made the slip the same as for the "Black Eagle," viz, 19.3 per cent, the oblique action in that case would have amounted to 18.3 per cent. If, now, to these losses be added those by friction of load, 10 per cent, and working engine, 12 per cent, we shall have a total of 59.6, which, deducted from 100, leaves 40.4, which is an inferiority of 2 per cent. Beside this 2 per cent economically, there is the important advantage that the perpendicular paddle wheel would have—less bulk and weight; and the bulk and weight can be still further reduced by increasing the slip, and consequently decreasing the loss by reaction.

The loss by reaction amounted to 6.7 per cent. Let us now increase the actual slip, 19.3, making it 25 per cent. With this slip the reactionary loss would be about 2.8 per cent, to which add the 25 per cent slip, 10 per cent for friction of load, 12 per cent for working engine, and 9.5 per cent for friction of wheel's eccentric strap and levers' journals, and we have a total of 59.3, which, deducted from 100, leaves 40.7 per cent utilized, almost exactly the same as utilized with a radial paddle wheel of 19.3 per cent slip, and a loss of 18.3 per cent by oblique action, being the loss normal to a sea-going immersion.

With these proportions of losses, we perceive the two kinds of paddle wheels are economically equal, but there remains a great practical superiority in favor of the perpendicular wheel from its greater slip, viz, its still greater reduced bulk and weight normal to the increased slip; and as this reduction in its paddle surface can be made wholly in the direction of length, its practical value is of high importance. Let us ascertain the amount of this reduction.

Premising that the propelling efficiency of propelling surfaces is as the squares of the speeds with which they strike the water; and supposing a certain speed of vessel to be given with a certain propelling surface, 1.00, having a velocity of 1.00, and a slip of 19.3; now what amount of surface would be required to propel the vessel at the same velocity but with a slip of 25? Supposing the centre of reaction of the paddle wheels to be of equal diameters, it is evident that the number of revolutions to give the vessel equal speeds with the unequal slips, 19.3 and 25, will be as the slips.

The velocities of the propelling surfaces will therefore be as 19.3 and 25, or as 1.0 to 1.3; the squares of which are 1.00 and 1.69. Then 1.69 : 1.00 :: 1.00 : 0.59; that is, there would only, with the 25 per cent slip, be required .59 of the paddle surface required for the 19.3 per cent slip, and this reduction being made in the length of the paddle, would reduce the length of the "Black Eagle's" paddle from 5½ feet to 3½ feet, a very valuable practical result.

A practical advantage resulting from increased slip, is that the same engine can develop a greater power, and give the vessel a greater speed, or a less engine develop an equal power. The saving is obviously in the first cost of engine, and in its less bulk and weight in the weight of the ship.—We should, therefore, give all the slip possible, keeping the sum of the losses a minimum. If increased slip be given without its reducing in a nearly equal degree some other loss, its advantages are obtained at a waste of fuel equal in per cent to the increase of slip.

Our general conclusion is, then, that for sea-going vessels of medium size and a 9 days' voyage, the perpendicular paddle wheel possesses decided advantages over the radial paddle wheel, both economically, potentially, and in view of the practical advantages of less strain upon the machinery and ship—less weight and more equable action.

Washington, July 5th, 1850.

Pennsylvania.

Philadelphia, Wilmington and Baltimore Railroad.—The Boston Post has the following details of the receipts for the year ending Oct. 1, 1850:

For October, 1849.....	\$57,000
November, ".....	51,000
December, ".....	50,000
January, 1850.....	53,000
February, ".....	53,000
March, ".....	65,000
April, ".....	54,000
May, ".....	54,000
June, ".....	56,000
July, ".....	71,000
August, ".....	71,000
Sept., ".....	64,000

Interest, &c., estimated..... 5,000

Total for the year.....	\$704,000
Current expenses, estimated....	\$310,000
Interest.....	130,000
Dividends.....	136,000
Balance received for new depots, tracks, and in aid of future, about.....	128,000
	\$704,000

Or allowing the expenses to be 50 per cent., [a large estimate] the road really earned 6 per cent, on its capital of \$6,000,000.

The Post states that Col. Swift is to be appointed President of the Western Mass., railroad, in the place of Mr. Addison Gilmore, whose resignation will take effect on the first of January next.

European and North American Railroad.

Proposed New Atlantic Route.—We learn from the London Times that the British government is now engaged in the consideration of a plan of communication between Ireland and the United States, which has long occupied the thoughts of statesmen and merchants; and it suggests that the executive authorities in Ireland could not better employ their power than in ascertaining what are the difficulties in the way of achieving this great national work. From the west coast of Ireland to America, says the Times, a voyage by steam might be performed in so short a time as to be measured rather by hours than days. If packets were to sail regularly between the nearest harbor on the western coast and Halifax or New York, and there were direct telegraphic communication between that Irish harbor

and London, news might be transmitted from the borders of the Mississippi, and ultimately from the western coast of America, to every part of Great Britain and Ireland in less than a week. If, in addition to this telegraphic communication, a railroad were carried across Ireland from east to west, all who prefer travelling by land, would take their final departure from the Irish port, rather than incur the inconvenience and annoyance of the longer sea voyage which is necessary if the voyager start either from an English or a Scotch port. The fastest liners would in that case not be those which sail between Liverpool and America, but Irish vessels would enjoy that distinction and advantage, and the moral benefit to Ireland resulting from such constant contact with men of other countries would be incalculable.—*Washington Republic.*

Pumping a Lake Dry.

Dr. J. V. C. Smith, the editor of the Boston Medical Surgical Journal, who is now on a visit to Europe, gives an interesting description, in his editorial correspondence from Holland, of the manner in which the Lake of Haarlem is being drained by steam engines and is water sent to the sea:

"Six miles from Amsterdam is the inland lake of Haarlem, 21 miles long by 11 in width, which, three hundred years ago was found to be perceptibly increasing by shooting its waters further and further, and covering up the land, threatening the first commercial port in the realm with destruction, by flowing in upon its back. Various schemes, at that remote epoch, were devised by able counselors to stay the threatening danger. Three Dutch engineers, of acknowledged ability, proposed draining it by wind mills. They are entitled to remembrance from having suggested the plan adopted in 1844 for averting an impending calamity.

Seven years since, delay being no longer safe, a canal was dug around the whole circumference of the lake, averaging 200 feet in width by 10 deep.—Three monster engines are housed on the sides of the lake some six or eight miles apart, each moving eight monstrous pumps. All the pistons are raised at once, at every revolution of the machinery, raising 15,000 gallons of water, which is emptied into the canal, whence it is hastened on by a fourth engine to the Zeeuyder Zee, and thus it reaches the sea 15 miles distant. In 1849, the pumps, worked by three of the most powerful steam engines perhaps ever constructed, were set in motion; and up to this date, July 25th, 1850, have lowered the contents of the lake seven feet. By next April, it is anticipated that the bottom will be fairly exposed, and all the water conveyed away from this ancient basin. All this is executed at the expense of the government."

R. R. from N. York to the Coal Districts of Pennsylvania.

A convention of delegates from several adjoining counties, favorable to the connection of New York with the Lehigh and Schuylkill coal region, by railroads, was held at the borough of Allentown, in the county of Lehigh, on Tuesday the 2d day of October, inst. A. S. Bridges, of Lehigh, was chosen president, and Rowland Jones of Schuylkill, secretary.

The object of the meeting having been stated by the president, and upon consideration it being deemed proper that all interests should, if possible, be more fully represented before any final action, the following resolution, was unanimously adopted:

Resolved, That the officers of this meeting be requested to address circulars to the officers of the Delaware, Lehigh, Schuylkill and Susquehanna railroad company—Summersville railroad company—the Trenton and Belvidere railroad company—Lehigh Coal and Navigation company—Beaver Meadow Coal company—Hazleton Coal company—Buck Mountain Coal company—Sugarloaf Coal company—together with such other companies and individuals as in their opinion may have or take

an interest in the construction of the Delaware, Schuylkill and Susquehanna railroad, and request their attendance or be represented by delegates, at an adjourned meeting of this convention, to be held at Allentown on the 3d day of December next, at 1 o'clock P. M. of said day.

Canada.

Great Western Railroad.—We learn from the report of the President of this road, T. W. Haines, Esq., submitted to the stockholders at a meeting at Hamilton on the 14th instant, that the corporations of the towns of London and Galt, and Municipal Council of Middlesex, have declared their intention of taking £25,000 each in stock, as soon as necessary forms provided by the act, can be complied with; and other corporations and municipalities are about to follow, with such subscriptions as their resources will warrant.

These subscriptions and prospects within the localities more immediately interested, with the private subscriptions already obtained, have enabled the directors confidently to commence operations on the line, and a number of workmen are now employed on the second section of the central division, between this city and Dundas, which number will be increased as fast as possible, and the work proceeded with as rapidly as the means at the disposal of the company will warrant.

Two extra parties of Engineers are now employed in staking the line between the Grand river and London, and so soon as the necessary arrangements for negotiating the municipal debentures can be made, the contractors are to commence on the different sections between those points.

The amount of reliable private subscriptions exceeds £70,090, and your directors feel confident that this will be increased to £100,000 so soon as it becomes generally understood that the work is being proceeded with.

The company expect also to realize £219,176 for subscribers to the stock in England. £100,000 has also been subscribed by the city of Hamilton.

It is also expected that lines of railroads in the United States with a capital stock of \$40,000,000 will take stock in the above to the extent of 2½ per cent upon that amount. This would give additional means to the amount of £250,000. If such should be the case, ample means will be thus provided for the work.

Ohio.

Going Ahead.—Our Columbus and Cincinnati railroad will be through to Shelby in ten days.—This is the half way station to Columbus, and the point of junction with the Sandusky, Mansfield and Newark railroad. Clevelanders can then go to Sandusky, Cincinnati, Columbus, Mt. Vernon and Newark, without getting off the rail. The iron is being laid from Columbus north, so that it is confidently asserted by the contractor the road will be open and in working operation to Columbus by the first of January next. Who knows but our New Year's frolic will be in Cincinnati?—*Cleveland Plaindealer.*

The popular vote in Cincinnati on the loan of the credit of the city to certain railroads, taken on the 8th instant, resulted as follows:

	For.	Against.
Ohio and Mississippi railroad.....	7,318	1,217
Belpre and Cincinnati railroad.....	7,812	987
Eaton and Hamilton railroad.....	7,829	985
Covington and Lexington railroad.....	7,511	1,014

It will be seen that there was a large majority in favor of all the loans.

Indiana.

Indianapolis and Bellefontaine Railroad.—This was road opened to Pendleton on the 10th inst. The Indianapolis Sentinel, in giving an account of the opening celebration, says that "more than three thousand of our citizens passed up and down the line on the trains, and the people in mass from the surrounding country were there to participate in the celebration. Speeches were made by Governor Wright, Mr. Bradley, Judge Kilgore, Mr. Brough and Mr. Smith. The road was in fine order, and the thousands returned to their homes in the evening highly delighted with the scenes of the day, and all wishing the energetic company the utmost success in the great enterprise in which they are engaged."

Missouri.

Pacific Railroad Survey.—Mr. Kirkwood, Chief Engineer, returned on Monday, after several weeks' absence from the city, during which time he was on several different parts of the surveys now going on. The surveying party going up the Maramec Valley westward, are making their way with some hindrance along the Dry Fork of the Bourbeuse river, a branch of the Maramec. This route, besides passing near the Moselle and the Stella Iron Works, will lie within reach of the Maramec or Massey's Iron Works. It passes over the Mineral Ridge, and penetrates an iron, lead and copper mining country of a richness unsurpassed almost in the world. It may prove a little longer and somewhat more expensive than the Ridge route already surveyed, but it promises vast developments of mineral wealth.

The surveying party returning from the mouth of the Kansas, are now on, or about crossing, the Osage river in Miller county. It is designed that the two parties shall meet, unite their surveys, and return, all together, for the purpose of writing up, and completing their recent labors.—*St. Louis Intelligencer.*

United States Mint.

The following statistics are derived from the Treasurer of the Mint at Philadelphia:

Gold bullion deposits for Sept., 1850.	\$3,400,000 00
Silver " " "	33,000 00

Total deposits.....	\$3,433,000 00
Gold coinage for the same period....	2,512,300 00
Silver " " "	89,950 00
Copper cents " " "	2,928 36
Copper half cents " " "	99 62

Total coinage for September.....	\$2,605,277 98
To which add amount of proceeds of transfer drafts.....	2,300,000 00

Total payments for September.....	\$4,905,277 98
Gold deposits from January to Aug., inclusive, as previously reported..	17,041,210 31
Gold deposits for the month of September.....	3,400,000 00

Total gold deposits to Sept. 30.....	20,441,211 31
Silver deposits from January to September inclusive.....	347,342 62

Total gold and silver deposits.....	20,790,552 93
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Wisconsin.

The agent of the English capitalists—who have loaned a million or more of dollars, to aid in constructing the proposed railroad from Fond du Lac, down the Rock river valley, to Janesville, and thence to some point on the Galena and Chicago road, arrived at Chicago a few days since on his route to Janesville, with blank bonds to be filled and signed by the officers of the Valley railroad company, immediately after which, the Hon. Robert J. Walker, (ex-Secretary of the Treasury) will take them, and proceed to Europe to close the ar-

range for the money. The amount proposed to be loaned is one million of dollars for twenty years at seven per cent. The loan is a most favorable one for the company, and with the amount subscribed by responsible men (over \$300,000) enough to complete the stock of the entire road, according to the estimate of the engineers.

The above we see is going the round of the papers. It is news to us, and we believe it will turn out nothing more than "news" to any body.

Maine.

Buckfield Branch Railroad.—At the annual meeting of the stockholders of the Buckfield Branch railroad, held at Buckfield on the 31st ult., the following gentlemen were chosen directors: Virgil D. Parris, Portland; Joshua Parsons, Minot; Noah Prince, Ira Gardner, Artemas T. Cole, Addison G. Cole, Chas. F. Davis, Buckfield; Zary Robinson, Sumner; C. Thompson, Jr., Hartford.

At a subsequent meeting of the directors, Mr. Parris was chosen President.

Pennsylvania.

At a meeting of the directors of the Wrightsville, York and Gettysburg railroad company, held on Tuesday of last week at the office of the company in York, Md., the following gentlemen were elected:—

President—Robert M. Magraw.

Directors—John Herr, J. F. Cockey, T. Stevens, W. F. Walters, W. Thompson, Henry Welsh, A. Herr Smith, David G. Barnitz.

Tennessee Coal.

The Nashville Banner says: "We are gratified to learn that some most superior veins of coal have recently been discovered on the line of the railroad near the bank of the Tennessee river, which for excellence of quality, and abundance of supply, cannot probably be excelled in the United States. The coal approaches nearer the anthracite in appearance than any we have seen in the West; and for manufacturing purposes, can hardly, we should think, be excelled. This is a discovery of very great importance to the people of this city. Its proximity to the railroad will enable the proprietors of these mines to deliver coal here at the lowest rates, thus affording capitalists here every inducement to commence operations whenever the material is furnished. We understand the coal veins mentioned are over five feet in thickness, and are so close to the line of the railroad that cars could be loaded with scarcely any extra labor.—We hope our citizens will prepare to take advantage of this fortunate discovery."

Ohio.

Cincinnati, Hamilton and Dayton Railroad.—The Hamilton Intelligencer says that the work on this road is progressing rapidly. On Monday two boat loads of T iron arrived here designed for the portion of the road between Cincinnati and this place. The company is at this time engaged in securing the right of way between this place and Dayton, and we learn that it is the intention of the contractors to commence operations in a few days on that part.

Manufacturing in the Interior.

If the cost of forwarding to a market from some of the interior States eats up a large part of the value of their agricultural productions, those in these States engaged in manufacturing pursuits are protected for the same reason to a similar extent from the effects of foreign competition. If some of our interests at the north, the manufacture of iron for instance, is depressed, from the low price of the foreign article, those who find themselves unable to contend with the foreign manufacturer should

place themselves beyond the reach of his influence, by planting themselves where the cost of transportation together with the duty shall amply protect them. In this way many of the northern manufacturers have it in their own power to protect themselves.

The present time is peculiarly favorable to the commencement of the iron manufacture on a large scale, in some of the Southern and Western States. In most of them, this kind of industry is still in its infancy, the present demand being mostly supplied from abroad. The rapid progress of railroads in these States will not only supply the means of transportation to different parts of the country, but will create an immensely increased demand from the stimulus they will give to every kind of industry. Railroads will not only give to the public much greater means of purchasing, but will call into existence every kind of pursuits. Machine shops, cotton and woollen mills, establishments for the production of every article that enters into consumption will spring into existence, all of them requiring the constant supply of a large quantity of iron.

One of the best unoccupied fields probably for the manufacture of iron is East Tennessee. Its remoteness from the seaboard will constitute a good protection against English iron, and the rapid progress of railroads in that quarter will create an additional demand for it, which is now very large.—A rolling mill situated on the Tennessee river will not only enjoy all the means of transportation which that magnificent stream affords, but the railroad in addition, which is now making rapid progress through the East Tennessee Valley. The time is not far distant when this road will constitute one of the great lines of travel between the Gulf of Mexico and the north. East Tennessee, too, is known to be one of the most fertile portions of the State, and is certainly unsurpassed by any portion of the country in its mineral wealth. Its iron ores are of the best quality. Mineral coal exists in great abundance, and charcoal may be obtained in any quantity for \$3 per 100 bushels. Labor at the present time, for lack of demand, is much lower there than at the north. With such facilities for the production of iron, and with the great immediate and prospective demand, we certainly know of no part of the country which offers greater inducement for the manufacture of iron. The climate of East Tennessee is perhaps unequalled by any part of the Union. It is too far south for the rigor of our northern winters, and in the summer the thermometer rarely if ever goes above 80°. Will not some of our northern manufacturers try this new field.

Baltimore and Ohio Railroad.

For the benefit of the contractors among our subscribers, we give the substance of an Advertisement which appears in the Baltimore papers of lettings which are to take place on this road on the 24th of November next. They embrace the "graduation and masonry of about 33 sections or miles of the line, extending westwardly by the waters of Fish creek and Grave creek, and over the dividing ridges between them, from the 160th section of the part of the line already let, to the 204th section of the same line—being the only portion of the route remaining to be put under contract.

The work to be let will be exceedingly heavy—including a tunnel of 2450, another of 1250, and a third of 400 feet in length, a number of deep cuttings and embankments, and a considerable quantity of bridge masonry."

Michigan Southern R. R. Co. \$400,000 SEVEN PER CENT. MORTGAGE LOAN.

SEALED PROPOSALS for four hundred thousand dollars of the first and only mortgage bonds of the Michigan Southern Railroad Company, bearing seven per cent. interest, will be received until the 15th day of November next.

These bonds are issued under the provisions of a special act of the Legislature of Michigan, authorising the Company to dispose of or sell their obligations either within or without that State, at such rates or prices as may be agreed upon, and if sold below par, to be as binding as if sold at par.

They are secured by a mortgage executed to Shepherd Knapp, Esq., of the city of New York in trust for the bondholders.

This mortgage covers the entire line of the company's road in Michigan, whether already built or hereafter to be constructed, and it provides that bonds to an amount not exceeding one million of dollars in all may be issued; of which amount not more than \$400,000 can be issued until after the road shall have been completed to Sturges' Prairie, a distance of 117 miles from Lake Erie, to which point it will be completed by the first day of January next.

The security offered for the bonds is therefore a mortgage lien, and substantially the only lien, upon a road which, when completed to the State line of Indiana, will have nearly 140 miles of main line, besides a branch of 10 miles, and which will have cost, including the original outlay by the State, and the relaying the present track, about \$2,500,000; of which \$1,500,000 will be represented by stock.

The portion of the road already in operation, about 70 miles, yields an income ample to protect the entire debt proposed to be created, and the length of completed line and consequent increase of revenue, is daily increasing, affording a security which will place the payment of the debt beyond all contingencies.

For August, 1850, the earnings were \$16,417.27. For September, \$20,480. These receipts were derived from the road in its present unfinished condition. Fifty miles of completed road will be added to it within three months, and will be extended to the St. Joseph's river, at the Indiana State line, early next Spring, thus doubling the length of the main line now in operation.

This road is a part of a continuous line of railroads from the city of New York to the Mississippi river, by way of the Erie railroad and the Lake Shore road, and is an important link in the chain.

Nearly the whole of this great line from New York to the Mississippi river is either completed or in the course of construction.

As the means for the construction of the road ready for the iron are provided for by stock subscribed and being paid in, by regular instalments, and the proceeds of the bonds are mainly required for the purchase of iron heavy H rail and equipments, it is believed that no railroad bonds before the public offer greater inducement for safe investment than those of this company.

The mortgage empowers the Trustees, in case of failure, to pay the principal or interest of the bonds, to take possession of the road and receive its earnings, or to sell it, on due notice, and apply the proceeds to the extinguishment of the debt.

The bonds are in sums of \$1,000 each, payable at the Mechanics' Bank, in the city of New York, Nov. 1st, 1860, with interest at seven per cent. per annum, payable semi-annually in New York, on the 1st Nov. and 1st May. Interest warrants or coupons are attached to the bonds.

Four hundred thousand dollars of the bonds are now offered for sale.

Sealed proposals for any amount not less than \$1,000 will be received until the 15th of November next.

Proposals may be addressed to WINSLOW, LANIER & CO., No. 52 Wall street, or to E. C. LITCHFIELD, Treasurer, No. 65 Wall street, endorsed "PROPOSALS FOR MICHIGAN SOUTHERN RAILROAD BONDS."

\$300,000 (half the amount now offered) will be disposed of absolutely and without reserve to the highest bidder. The company reserve the right to withdraw the remainder if the offers are not satisfactory.

All necessary information in relation to the bonds, together with maps, may be obtained by calling on WINSLOW, LANIER & CO. or E. C. LITCHFIELD, at either of which places copies of the bonds and mortgages can be had.

Copies of the bonds and mortgage may also be seen on application to Shepherd Knapp, Esq., President of the Mechanics' Bank, or to James Van Nostrand, Esq., President of the Merchants' Exchange Bank.

Parties whose bids are accepted will be required to pay 25 per cent. upon the amount awarded to them immediately upon being notified of the acceptance of their bids, and the remainder in equal amounts on the 1st and 15th of December next, but any party will be at liberty to pay in full at once. Interest will commence from the day of payment.

New York, October 31, 1850.

GEORGE BLISS,
CHARLES BUTLER,
JOHN STRIKER,
JOHN B. JERVIS,
EDWIN C. LITCHFIELD,
Committee of Directors.

AMERICAN RAILROAD JOURNAL.

Saturday, October 19, 1850.

Canada.

Improvement of the Navigation of the St. Lawrence.—It is well known that the navigation of this great river is seriously obstructed by shoal water in Lake St. Peter, into which the river expands itself, about 70 miles below Montreal. The maximum depth of water over the bar in this lake is about 12 feet. This of course forms a complete barrier to the passage of large class ships to that city, and operates not only as a great check upon the growth of Montreal, which is the commercial emporium of the Canadas, but involves great loss and inconvenience in the transshipment which is now made necessary, of a great part of her exports and imports.

In 1844 the government of Canada undertook the work of deepening the channel, or rather of making a new channel over this bar, and after expending nearly £100,000 upon the work, abandoned its further prosecution. The project has again been revived, under the auspices of the Harbor Commissioners of Montreal, who have now ample funds at their disposal, and who are authorised by an act of the Provincial Parliament to resume and complete the work.

The plan which was pursued in the work already done, was to excavate a straight channel in the general direction of the current of the river. In consequence of the great amount already expended, and also of the diversity of opinion as to which course it was best to adopt, whether to deepen the present circuitous channel made by the current of the river, or to carry out the original undertaking of opening a straight channel, the Harbor Commissioners determined to act in the farther prosecution of the work, under advice of a board of engineers, composed of the best talent and widest experience which this country affords. This board has now been organised by the appointment of C. S. Gzowski, Esq., Chief Engineer of the St. Lawrence railroad, John Childe, Esq., Chief Engineer of the Mobile and Ohio railroad, etc., etc., and Col. McNeil, whose name is intimately connected from an early date with the progress of the public improvements in the United States. Mr. Gzowski, though not so well known in the United States as the other gentlemen, enjoys a high reputation for his professional skill, and possesses the entire confidence of our Canadian brethren. Messrs. Childe and McNeil possess a well known reputation

throughout this country of being two of our most experienced, best educated and skilful engineers, and the opinions of no other men among us in matters involving questions of great difficulty in engineering science, command more respect and attention.

The above commission will proceed at once to Montreal, where a steamer awaits them to take them to the scene of their labors. The subject is one of great importance, not only as affecting Montreal, but from the scientific questions connected with it. The report of these gentlemen will, we presume, be made at an early day, as it is intended to commence work in the Spring, for which the preparations are to be made this winter. The report, when made, we shall be happy to lay before our readers.

Michigan.

Michigan Southern Railroad.—The project of connecting by railroad the southern shores of Lake Erie and Michigan, which was one of the internal improvement schemes of the State of Michigan, and which was discontinued for want of means to carry it out, has recently been commenced under the auspices of a private company, with every prospect of success. That part of the line from Monroe to Hillsdale, a distance of 68 miles, and a branch to Tecumseh, 10 miles long, was completed by the State at a cost of about \$1,300,000. The present company has added between two and three miles to the eastern end of the road for the purpose of extending it to the lake. On the western end, from Hillsdale to Sturges Prairie, a distance of 47 miles, the line is to be opened this fall, making the whole length of line completed 117 miles, at an aggregate cost of about \$2,000,000. From Sturges Prairie to the Indiana State-line, the distance is about 23 miles, to be completed in the spring of 1851. At the State line it will connect with the Northern Indiana railroad, extending to Michigan city, most of the means for the construction of which are already secured. From Michigan city a road is already in progress under another charter, which will be completed within a year of the present time. The whole line, therefore, is so far provided for, that its completion at any early day is no longer a matter of doubt.

This road, connecting as it does the southern extremities of the two great lakes, Erie and Michigan, occupies one of the most natural and one of the most important routes for travel in this country. All the northern lines of railroad running east and west through this country must pass round the southern end of Lake Michigan. A large part of the travel for the same reason must follow the southern shore of Lake Erie. A large portion of this must as a necessary consequence fall upon this road. What gives additional importance to the above project is the fact that the whole line of railroad from the Atlantic coast to the Mississippi, of which this is a part, is now in progress, so that in addition to the local traffic of this line, it will constitute a part of one of the most important through routes in the country. An examination of a map of the country will illustrate this more forcibly than anything that can be written.

To complete the road from Monroe to the State-line of Indiana, a loan of \$1,000,000 is now asked for. This loan is based upon the whole cost of the road, about \$2,500,000. The income of the part now built for the year ending July 31st, 1850, exceeded \$102,000. The earnings for August and September of the present year were \$37,000. When

completed to the Indiana State-line its income cannot be less, in our opinion, than three times its present amount, and its net income must be at least \$175,000. The road, too, is in the best hands. Its financial affairs are managed by gentlemen of ability and experience. The road is under charge of J. B. Jervis, Esq., of this city, which of itself is sufficient guaranty for the management of his appropriate department. As to the goodness of the security offered there can be no question. This depends upon no contingency, but will be amply provided for by the road already built.

Vermont Central Railroad.

This stock has made its appearance among the fancies in Wall street, and we see that its introduction among us is ushered in by long articles under the money heads of some of the city papers, repeating here the same old story which has deceived, to their cost, so many credulous Bostonians; to wit, that this is but another Western road, a perfect parallel; not only in progress, but results. The Vermont Central like the Western railroad! "Hyperion to a satyr"! Never were a people more thoroughly humbugged than were the Bostonians by such talk as this. Credulity having been pretty well exhausted there, the friends of this road are trying to come the same blarney over the New Yorkers. Let us look at the parallel so often instituted between the Central and the Western, and examine a little into the merits of the former.

The line of the Western railroad is identical with the natural route of travel between New England and New York and the Western States. It thus far is without a rival, being the only road running East and West through Massachusetts. It consequently enjoys a monopoly of the carriage in the direction of its line. It is connected with other important roads which are tributary to it. It passes through a densely inhabited manufacturing region, and connects Boston on the one hand, and Troy and Albany on the other—the two last cities now containing about 100,000 inhabitants. How is it with the Central? It traverses a sparsely inhabited agricultural district, which is almost entirely destitute of manufacturing establishments, and where there is little prospect that any will exist for a long time to come. It does not run through a single town of any magnitude or importance. The people on the line of the road can contribute but little business to it, as they live mostly within themselves, and have but little to send to market, consequently buy but little. It is a through route only in direction of the Canadas, between which and the United States there is but little connection. It is burdened by a contract to pay to the stockholders of the Vermont and Canada for the use of this last road a dividend equal to 8 per cent., which is probably a much larger sum than the road can ever earn. Think of a contract to pay 8 per cent. upon a remote frontier road for 50 years, when there is hardly a road in New England which can divide such a per centage. Again, the Central has now one rival road, the Rutland, occupying a shorter and better line between the same termini, and will soon have another for a part of its line, in a road from Montpelier to Wells River. The Central has got to contend not only with these, but with the feeling of bitter hostility felt towards it by the people of Vermont from the manner in which its affairs have been managed.

So much for a general parallel. Let us examine the workings of the two. The cost of the Western is about \$8,000,000; of the Central \$3,000,000.—

Their earnings, therefore, to make stocks of the same relative value should be as 2½ to 1. The Western must earn this year about \$1,400,000. If this road must earn this amount to maintain its stock at par, the Central should earn \$525,000 to make its stock worth thirty dollars per share at par value, taking the cost of the road. Now we presume that no one claims that its earnings the present year will much if any exceed one-half that sum. If the Western, therefore, is worth par only, the Central is worth \$15 per share. So much for a parallel of results.

The truth is that the Vermont Central was a bad speculation in the outset, and bad as it was, it has been worse managed. Our stock buyers here will do well to be cautious of it. The present rise in it is speculative, and cannot long be sustained. The history of losses by it in Massachusetts should be a sufficient caution to purchasers in this market.

India-rubber Springs.

We understand that Mr. F. M. Ray has filed a bill in the U. S. C. Court to restrain W. C. Fuller from proceeding further under his patent, the Commissioner of Patents at Washington having decided the question of priority of invention in favor of Mr. Ray, and issued to him a patent pursuant thereto. The Office of the New England Car Co. for the sale of India-rubber springs is removed to 104 Broadway.

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NOTICE.

A MEETING of the Stockholders of the Tonawanda Railroad Company, will be held at the Railroad Hotel, in the village of Attica, in the county of Wyoming, on the 18th day of November next, at 12 o'clock, at noon, for the purpose of passing upon the ratification of an agreement for the consolidation of the Tonawanda Railroad Company and the Attica and Buffalo Railroad Company, into a single corporation, made by the directors of the said two corporations, and to be submitted to said meeting. Dated October 8, 1850. F. WHITTLESEY, Sec'y.

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JOHN F. WINSLOW, Agent.

Albany Iron and Nail Works, Troy, N. Y.
The above Spikes may be had at the following prices, at
Erastus Corning & Co Albany; Merritt & Co., New
York; E. Pratt & Co., Easton, Md.

LAP—WELDED
WROUGHT IRON TUBES

FOR

TUBULAR BOILERS,FROM ONE AND A QUARTER TO SEVEN
INCHES IN DIAMETER.

THE ONLY Tubes of the same quality and man-
ufacture as those so extensively used in England,
Scotland, France and Germany, for Locomotive, Ma-
rine and other Steam Engine Boilers.

THOMAS PROSSER & SON, Patentees,
28 Platt street, New York.**Railroad Iron.**

THE UNDERSIGNED ARE PREPARED TO
contract for the delivery of English Railroad Iron
of favorite brands, during the Spring. They also re-
ceive orders for the importation of Pig, Bar, Sheet, etc.
Iron.

THOMAS B. SANDS & CO.,73 New street,
New York.

February 3, 1849.

Iron Store.

THE Subscribers, having the selling agency of the
following named Rolling Mills, viz: Norristown,
Rough and Ready, Kensington, Triadelphia, Potts-
grove and Thorndale, can supply Railroad Companies,
Merchants and others, at the wholesale mill prices for
bars of all sizes, sheets cut to order as large as 68 in.
diameter; Railroad Iron, domestic and foreign; Loco-
motive tire welded to given size; Chairs and Spikes;
Iron for shafting, locomotive and general machinery
purposes; Cast, Shear, Blister and Spring Steel; Boil-
er rivets; Copper; Pig iron, etc., etc.

MORRIS, JONES & CO.,

Iron Merchants,

Schuylkill 7th and Market Sts., Philadelphia.
August 16, 1849. ly33**Railroad Iron.**

THE MOUNT SAVAGE IRON WORKS, AL-
legany county, Maryland, having recently pass-
ed into the hands of new proprietors, are now prepar-
ed, with increased facilities, to execute orders for any
of the various patterns of Railroad Iron. Commu-
nications addressed to either of the subscribers will have
prompt attention. **J. F. WINSLOW, President**

Troy, N. Y.

ERASTUS CORNING, Albany**WARREN DELANO, Jr., N. Y.****JOHN M. FORBES, Boston.****ENOCH PRATT, Baltimore, Md**

November 6, 1845.

Railroad Iron.

THE SUBSCRIBERS ARE PREPARED TO
take orders for Railroad Iron to be made at their
Phoenix Iron Works, situated on the Schuylkill Riv-
er, near this city, and at their Safe Harbor Iron Works,
situated in Lancaster County, on the Susquehanna
river; which two establishments are now turning out
upwards of 1800 tons of finished rails per month.

Companies desirous of contracting will be promptly
supplied with rails of any required pattern, and of the
very best quality.

REEVES, BUCK & CO.45 North Water St. Philadelphia,
March 15, 1849.

Tredegear Iron Works.

ROLLING MILL FOUNDRY AND MACHINE SHOPS. The undersigned continues to manufacture at his Works in this city (from best charcoal metal) Bar Iron of every description, embracing—Rounds and Squares, from 1½ to 5 inches diameter. Flats, from 1 to 7 inches, all thicknesses. Bands and Scrolls, all sizes. Boiler plate and Plough Iron. Railroad and Locomotive Axles and Tires. Locomotive Frames, Spikes and Plates. Hoops, Ovals, Half Ovals, Half Rounds, Angle, T, L, and indeed every description of Iron usually manufactured, all of which he warrants to be equal to any made in this country. He also manufactures at his Foundry and Machine Shops all descriptions of Railroad Work, say, Locomotives, Railroad Wheels and Axles complete and ready for the road, Railroad Chairs, etc. Also, Marine and Stationary Engines all sizes, Sugar mills and Engines, Horse mills, and every kind of Machinery usually required for the operations of the country. He has paid particular attention to getting up machinery, etc., for Gold Mine operations, and those in want of such work might find it to their advantage to give him a call.

J. R. ANDERSON.
Richmond, Va., Sept. 10, 1850.

CUT NAILS OF BEST QUALITY, BAR IRON (including Flat Rails) manufactured and for sale by
FISHER, MORGAN & CO.,
75 N. Water St., Philadelphia.

Iron Wire.

REFINED IRON WIRE OF ALL KINDS, Card, Reed, Cotton-flyer, Annealed, Broom, Buckle, and Spring Wire. Also all kinds of Round, Flat or Oval Wire, best adapted to various machine purposes, annealed and tempered, straightened and cut any length, manufactured and sold by
ICHAUD WASHBURN.
Worcester, Mass., May 35, 1849.

Wheel, Forge and Foundry Iron.

LOCUST GROVE Wheel Iron of great strength and superior chilling property.
Balt. Charcoal Forge Iron, from Patuxent, Curtis Creek and Gunpowder furnaces.
Elkridge Foundry Iron, of superior strength and softness. Anthracite and Charcoal Iron from Pennsylvania and Virginia. Gas and Water Pipes, Lamp Posts from Elkridge furnace.

LEMMON & GLENN,
62 Buchanan's Wharf, Baltimore.

S. S. Keyser & Co.,
IRON WAREHOUSE,
Corner of South and Pratt Streets,
BALTIMORE, MD.

Selling Agents for the Rough and Ready Bar Iron and Elk Boiler and Flue Iron Rolling Mills, Sarah and Taylor Furnaces, and Wrightsville Hollow Ware Foundry, and Dealers in Bar and Sheet Iron, and Cast, Sheer, German, Blister, Spring and Electroplated Steel, etc., etc.

Smith & Tyson,

GENERAL COMMISSION MERCHANTS,
No. 25 South Charles St., Baltimore, Md.

AGENTS for the Celebrated Columbia Pig Iron, suitable for Car Wheels and Chilled Rails.
Columbia refined Charcoal Blooms; Refined Charcoal Juniata Billet Iron for Wire; Refined Iron for Bridging, of great strength; Cut Nails, Spikes, and Brads; Railroad Spikes and Wrought Chairs. 22tf

Stickney & Beatty,
DEALERS IN IRON AND IRON
MANUFACTURERS.

AGENTS for the Balt. City Rolling Mill, from which establishment they are prepared to furnish Ellicott's round, square, and flat bar iron, puddled and charcoal boiler plates and billet iron—also agents for the sale of the Laurel and Maryland (Balt.) charcoal forge pig irons, Balt. hard iron for chilling wheels, anti-eatam nails, Catoctin foundry iron, boiler blooms from the Caledonian works, Wm. Jessop & Son's cast steel, Coleman's blister steel and nail rods, hoop, band, sheet, oval and common English iron.

Nos. 18 and 20 South Charles st., Baltimore.

Railroad Iron.

CONTRACTS made by the subscribers, agents for the manufacturers, for the delivery of Railway Iron, at any port in the United States, at fixed prices, and of quality tried and approved for many years, on the oldest railways in this country.

RAYMOND & FULLERTON, 45 Cliff St.

IRONDALE PIG METAL, MANUFACTURED and for sale by the Bloomsburg Railroad Iron Co.
LINDLEY FISHER, Treasurer.
75 N. Water St., Philadelphia.

Railroad Iron.

2000 Tons, weighing 53 pounds per lineal yard, of the most approved pattern of T rails, in store and to arrive, for sale by
COLLINS, VOSE & CO.,
74 South St.
New York, June 1, 1850.

Railroad Iron.

3,000 TONS C. L. MAKE 63½ lbs. per yard, now landing and to arrive.
Also contracts made for future delivery of above superior make English Iron.
300 Tons Banks Best Iron, Round, Square and Flat.
200 " English Bar " " " "
10 " 9-16 Square Iron for Railroad Spikes.
For sale in lots to suit purchasers by
DAVID W. WETMORE.
New York, March 26, 1850. 3m

WILLIAM JESSOP & SONS'
CELEBRATED CAST-STEEL.

The subscribers have on hand, and are constantly receiving from their manufactory,
PARK WORKS, SHEFFIELD,
Double Refined Cast Steel—square, flat and octagon.
Best warranted Cast Steel—square, flat and octagon.
Best double and single Shear Steel—warranted.
Machinery Steel—round.
Best and 2d gy. Sheet Steel—for saws and other purposes.
German Steel—flat and square, "W. I. & S." "Eagle" and "Goat" stamps.
Genuine "Sykes," L. Blister Steel.
Best English Blister Steel, etc., etc., etc.
All of which are offered for sale on the most favorable terms by
WM. JESSOP & SONS,
91 John street, New York.
Also by their Agents—
Curtis & Hand, 47 Commerce street, Philadelphia.
Alex'r Fullerton & Co., 119 Milk street, Boston.
Stickney & Beatty, South Charles street, Baltimore.
May 6, 1849.

JOHNSON, CAMMELL & Co's
Celebrated Cast Steel,

AND
ENGINEERING AND MACHINE FILES, which for quality and adaptation to mechanical uses, have been proved superior to any in the United States. Every description of square, octagon, flat and round cast steel, sheet, shovel and railway spring steel, best double and single shear steel, German steel, flat and square, goat stamps, etc. Saw and file steel, and steel to order for any purposes, manufactured at their Cyclops Steel Works Sheffield.
JOHNSON, CAMMELL & CO.,
100 William St., New York.
November 23 1849.

Railroad Iron.

THE Undersigned, Agents for Manufacturers, are prepared to contract for the delivery of English, Welsh and Scotch Rails, of any pattern and weight, also for every description of English, Welsh, Scotch, and Swedish Iron, Railway Chairs and Spikes, Rivets, Bolts, Nuts, Washers, Chain Cables, Anchors, Tin Plates, German Spelter, Iron Castings, and every description of Machinery.

WILLIAM BIRD & CO.,
Iron and Tin Plate Merchants,
44 Wall st., New York.
And at 5 Martin's Lane, City, London,
and 140 Buchanan st., Glasgow.

July 27th, 1850.

To the Proprietors of Rolling
Mills and Iron Works.

THE Undersigned—Proprietors of Townsend's Furnace and Machine Shop, Albany—are extensively engaged in the manufacture of Machinery and fixtures for Iron, and Copper Rolling Mills, and Iron Works. Having paid particular attention to the manufacture of *Rolls* (Rollers), both *chilled* and *dry-sand*, they feel confident that they can execute orders for such castings in a satisfactory manner. And to give assurance of this, they beg leave to refer to the following named persons, proprietors and managers of some of the most extensive rolling mills in the country, viz: Jno. F. Winslow, J. Tuckerman, H. Burden, W. Burtt, J. & J. Rogers, Saltus & Co., J. B. Bailey, L. G. B. Cannon, Hawkins & Atwater, etc., etc.

F. & T. TOWNSEND.
Albany, August 18, 1849.

Railroad Iron.

B. O. Railway Tires, Railway Wheels,
Scotch Pig Iron, Tin Plates and Banca Tin,
Muntz Patent Metal Sheathing,
Baltimore Copper.
Contracts for Rails made on behalf of the manufacturers, for delivery at any ports in the United States, at fixed prices.
Bowling Tires and Tire Bars and Scotch Pigs imported to order.
Muntz's Ship-sheathing, and a general stock of Tin Plates and Banca Tin in store, and for sale by
RAYMOND & FULLERTON, 45 Cliff St.

Bowling Iron. Stamped B.O.

Railway Tire Bars Rivet Iron
Locomotive and other Axles Locomotive Frame do
Boiler Plates Bars.
and every other description of this superior Iron.
The subscribers, agents for the sale of Bowling Iron, are prepared to execute orders for importation, especially for railway and machinery uses, with despatch from the manufacturers.
RAYMOND & FULLERTON, 45 Cliff St.

Lovegrove's Patent Cast Iron
Water and Gas Pipes.

THE Subscriber, the Inventor and Patentee of the Centrifugal mode of giving form to metallic substances while in a molten state, is preparing to make Cast Iron Water and Gas Pipes, of any dimensions, at prices much lower than they can be made in the old manner, and the pipes warranted to stand a pressure of three hundred pounds to the square inch, and to be soft enough to drill. Steam Engines and all kinds of machinery. Cast Iron Doors and Frames, and Mill Castings of every description, made to order.
THOMAS LOVEGROVE,
Machinist and Founder,
West Falls Avenue, below Pratt st., Baltimore.

Ray's Patent India Rubber
Car Springs.

Savannah, Ga., May 22, 1850.
FOWLER M. RAY, Esq.,
Dear Sir: I have no hesitation in saying, after having used on our road your springs and Fuller's, that I consider yours decidedly the best in every particular, and in this opinion I am sustained by all our officers. Fuller's spring has a tendency to split, and also to chafe or abrade by the constant friction on the cast iron plates or disc: and in my opinion is not near so elastic as yours.
Your springs, which have been in use on our road for 12 or 15 months past, and in constant use under both passenger and freight cars, are to all appearances as elastic, sound and good, as when first put in use.
We are now building eighty-five new cars, of which for fifty-sets the springs have been ordered of you.

GEORGE A. ADAMS,
Master Carpenter,
Central Railroad and Banking Co. of Georgia.

Connecticut River Railroad Office, }
Northampton, May 4, 1850. }

E. CRANE, Esq.,
Dear Sir: It is now about two years since I first tried the experiment of using a set of Ray's India-rubber Springs upon one of our merchandise cars, and although the car has been in constant service since that time, I do not on examination find the slightest difference either in the thickness or elasticity of the material.

The same result has followed wherever we have applied them, either for wheel or draw springs on Engines, Tenders or Cars. At present we use no other; either in replacing old springs or building new cars—and I am perfectly satisfied that for economy, durability, safety, and ease of motion, that Ray's India-rubber is the best article for Springs which has been presented to the public.

Yours respectfully, J. HUNT,
Supt. Connecticut River Railroad.

EDWARD CRANE, Esq.,
Dear Sir: Having applied to cars of the Boston and Worcester Railroad Corporation, Ray's Vulcanised Rubber Springs (where they have been in use for some two years last past), I have had occasion to observe their operation, and am free to say in answer to your inquiries, that they retain their elasticity perfectly during all changes of atmospheric temperature: and are in my opinion a most valuable acquisition to Railroad Cars—are not liable to derangement, as is the case with steel springs; while at the same time it costs less to apply them. Respectfully yours,
D. N. PICKERING,
Supt. Motive Power, Bost. & Wor. Railroad.
Boston, April 15th, 1850.

Monument Foundry.

A. & W. DENMEAD & SON,
Corner of North and Monument Sts.,—Baltimore,
HAYING THEIR

IRON FOUNDRY AND MACHINE SHOP

In complete operation, are prepared to execute faithfully and promptly, orders for Locomotive or Stationary Steam Engines, Woolen, Cotton, Flour, Rice, Sugar Grist, or Saw Mills,

Slide, Hand or Chuck Lathes, Machinery for cutting all kinds of Gearing. Hydraulic, Tobacco and other Presses, Car and Locomotive patent Ring Wheels, warranted,

Bridge and Mill Castings of every description, Gas and Water Pipes of all sizes, warranted, Railroad Wheels with best faggoted axle, furnished and fitted up for use, complete

Being provided with Heavy Lathes for Boring and Turning Screws, Cylinders, etc., we can furnish them of any pitch, length or pattern.

Old Machinery Renewed or Repaired—and Estimates for Work in any part of the United States furnished at short notice.

June 8, 1849.

RAILROAD CAR AND COACH TRIMMINGS.

Doremus & Nixon,
IMPORTERS AND FURNISHERS

HAVE FOR SALE

Plain Garnet Plush. Fig. Garnet Plush (Butterfly pat.
"Crimson" "Crimson" (Elegant.
"Scarlet" " " (Gen. Taylor.

BROCATELLES.

Crimson Silk Brocates. Gold and Maroon do.
Gold and Blue " " Brown "
Silk and Wool " of every color.

MOQUETTES,

Of elegant designs and colors.

GERMAN CLOTH FOR CAR LININGS.

The most beautiful goods ever shown in this country, and the subscribers are the sole agents for the sale of them.

Oil cloths Enamelled with Gold. These goods can be
" " Silver. furnished in any
Do. Silver ground velvet printed. dimensions req'd.

CURLED HAIR

Of every description and quality.

JNO. W. A. STRICKLAND, Agent.
New York, 1850. 1716

FOWLER M. RAY'S Patent India-rubber Railroad CAR SPRING.

New York and Erie Railroad Shops.
Piermont, March 26, 1850.

This will certify that from practical experience in the use of Fowler M. Ray's India rubber Car Springs, I believe them to be far superior to any others now in use.

I have never known them to be affected by any change of temperature, as other Rubber Springs have been affected on this road.

I am at the present time repairing a Passenger Car that Mr. Ray and myself mounted with his springs about two years and eight months since.

The springs are at the present time as perfect, to all appearances, as when first applied to the car.

Respectfully yours,

HORACE B. GARDNER,
Foreman of the Car Shops.

Supt. Office N.Y. & H. R.R., }
New York, March 8, 1850.

This is to certify that we have used the Rubber Springs manufactured by Mr. F. M. Ray for the past twenty months, "both for Passenger and Freight Car Springs and Bumpers, and of different sizes," and have in every case given entire satisfaction, and I consider them the best spring now in use.

M. SLOAT, Supt.

Boston, March 5, 1850.

In answer to your enquiry about India-rubber Springs, I have to say that we have used them to a considerable extent on both freight and passenger cars, and also on several of our tenders; and I am very well satisfied that they answer all the purposes for which they are intended. I believe the India-rubber will soon supersede all other springs for cars and tenders.

Yours truly,

S. M. FELTON,
Supt. Fitchburg Railroad.

Office New Jersey Railroad Co., }
Jersey City, March 8, 1850.

FOWLER M. RAY, Esq.,

Dear Sir: In answer to your enquiries respecting the operation of the Vulcanised Rubber Springs, purchased by our company from you some two years since, I reply that they are superior to any spring in use, (that I have either seen or heard of).

The improved form of your spring, consisting of a solid piece of vulcanised rubber with bands on the outside, is far superior to your first form, consisting of disks of rubber with metallic plates interposed.

The last named form was tried, if you recollect, at a much earlier period; and then was replaced by your last form.

I have no hesitation in saying that your springs have given entire satisfaction, and most cheerfully recommend them to railroad companies throughout the country for the following reasons:

1st. The cost is 30 per cent. less.

2d. Saving of weight on each car of 8 wheels from 700 to 800 lbs.

3d. Less care and attention is required, as they are not liable to get out of repair.

4th. A great saving is secured in the wear and tear of the cars and rails from their great elasticity.

5th. The freedom from noise.

6th. There is greater safety in case of accident, as they cannot be broken.

7th. The comfort of passengers is enhanced sufficiently to pay the expense, waiving all the other reasons that I have given.

Should this fail to satisfy any person enquiring, you are at liberty to refer to me, No. 150 Washington St., Jersey City. Yours respectfully,

T. L. SMITH, Supt.

New York, March 11, 1850.

I have used the Patent India-rubber Spring purchased of Mr. Ray, upon the cars of the New York and New Haven Railroad, and have found them efficient and economical; and when applied to the axles and draw springs, believe them to be quite equal to any in use. I have found a combination of these springs with a steel spring under the transom beam a very satisfactory arrangement, and am now using this plan in all new cars.

Yours respectfully,

ROBERT SCHUYLER.

February 25, 1850.

From practical observation of the use of the India-rubber Car Springs, manufactured and sold by your company, we are entirely satisfied in their application, and do not hesitate to recommend them as elastic, durable, requiring no repairs for years, and retaining their consistency during all extremes of weather. We have applied them for the past two years, and consider them superior for all railroad purposes.

Yours truly,

OSGOOD BRADLEY, Car Builder, Worcester.
T. & C. WASON, do. Springfield.
DEAN, PACKARD & MILLS, do. do.
DAVENPORT & BRIDGES, do. Cambridgeport.

Office of the New Jersey Railroad Co., }
Jersey City, March 7, 1850.

This is to certify that we have had Mr. F. M. Ray's India-rubber Springs in constant use under our cars, and as Bumper Springs for upwards of two years, and they have in every way given perfect satisfaction.

The present form of spring we deem far superior to the form of Disk, having used both forms, although we have none of those made in Disks at present in use.

We take pleasure in recommending these springs to all railroad companies.

J. P. JACKSON, Vice Pres.
New Jersey Railroad and Trans. Co.

Roxbury, February 23, 1850.

In compliance with your request, I take great pleasure in stating the result of my experience in the use of "Ray's Patented Vulcanised India-rubber Car and Engine Springs." We have used them nearly two years, and never had one fail in any way. The cold weather does not affect them, as it has other rubber springs we have used.

With sixteen years' experience as superintendent of machinery on the Boston and Providence railroad, I take pleasure in saying that your springs are the best we ever used, or I ever saw used elsewhere. We have 20 cars rigged with them, of which I can say that the springs are as good now as when first applied. I put 24 lbs. of the rubber under the forward end of one of our heaviest engines, taking off 250 lbs. of steel springs—it has been in use 18 months, and is in as good condition now as when first put under the engine.

Very respectfully yours,

GEO. S. GRIGGS,
Supt. of Machinery, Boston and Prov. R.R.

Fall River, February 2, 1850.

In answer to yours of the 20th ult. I would say that this company has for some 10 or 12 months past been using "Ray's India-rubber Springs." We have applied them to both passenger and freight cars with uniform success. They have invariably preserved their elasticity and consistency through all the extremes of weather; and we are now applying them whenever the steel spring fails. I am well satisfied that they are particularly adapted for railroad purposes.

Very respectfully yours,

GEO. HAVEN,
Supt. Fall River Railroad.

Jersey City, March 9, 1850.

This is to certify that the present form of Mr. F. M. Ray's India-rubber Car Spring I consider far superior to the form of Disk, having used both forms.

I take pleasure in recommending these springs to all railroad companies.

DAVID H. BAKER,
Foreman of Car Shop of N.J. R.R. & Trans. Co.

Harlem R.R. Depot, }

New York, March 7, 1850.

This is to certify that we have used Mr. F. M. Ray's India-rubber Springs for over eighteen months, and find them to be easy and durable, and recommend them to railroad companies as being superior to anything we have tried.

J. M. SMART,

Foreman at 42d St. Depot.

Old Colony Railroad Office,
Boston, March 6, 1850.

EDWARD CRANE, Esq.,

President New England Car Co.,

Dear Sir: In compliance with your request I would state that the Old Colony Railroad Company have had in use upon their road, India-rubber Springs furnished by your company, for more than eighteen months past, during which time they have been extensively used under Passenger and Freight Cars, Locomotive Tenders, and for Drawer and Buffing Springs, with the most perfect success. The elasticity and consistency of the Rubber has never been unfavorably affected by either extremes of heat or cold—and from the experience which we have had in the use of Rubber Springs, I think them well adapted for railroad purposes—and therefore we have for some months past used Rubber almost exclusively, in all places where springs are required.

Respectfully yours, etc.,

JAS. H. MOORE,
Supt. O. C. Road.

Troy, February 27, 1850.

We have been using your India-rubber Car Springs for nearly two years—and we take pleasure in saying that in our opinion the rubber has to a certain extent already, and may eventually entirely supersede all other Springs for Railroad Car purposes. We now use it entirely for Draw Springs and Bumpers, considering it better and lighter than steel.

During our two years' experience in the use of it, we have not known any to lose their elasticity, or fail in any way; and we cheerfully recommend the rubber for railroad car springs.

Very respectfully,
EATON, GILBERT & CO.

Passenger Car Linings.

THE Advertiser continues to make to order the Enamelled Car Linings which have been so highly approved the last three years, and are now exclusively used by all the Northern Railroads. No pains are spared to get out new styles, and adapt them to the tastes of every consumer.

Orders addressed to CHARLES STODDER, No. 75 Kilby street, Boston, will have prompt attention.

March 23, 1850.

2m

India-rubber for Railroad Cos.

RUBBER SPRINGS—Bearing and Buffer—Fowler's Patent—Hose from 1 to 12 inches diameter. Suction Hose. Steam Packing—from 1-16 to 2 in. thick. Rubber and Gutta Percha Bands. These articles are all warranted to give satisfaction, made under Tyer & Helm's patent, issued January, 1849.—No lead used in the composition. Will stand much higher heat than that called "Goodyear's," and is in all respects better than any in use. Proprietors of railroads do not be overcharged by pretenders.

HORACE H. DAY,

Warehouse 23 Courtlandt street,
New York, May 21, 1849.

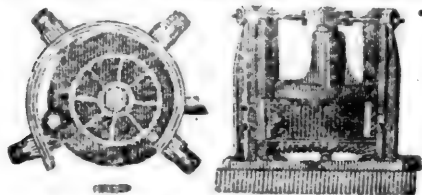
Spikes, Spikes, Spikes.

ANY person wishing a simple and effective Spike Machine, or a number of them, may be supplied by addressing
J. W. FLACK,
Troy, N. Y.

March 6, 1850.

MACHINERY.

Henry Burden's Patent Revolving Shingling Machine.



THE Subscriber having recently purchased the right of this machine for the United States, now offers to make transfers of the right to run said machine, or sell to those who may be desirous to purchase the right for one or more of the States.

This machine is now in successful operation in ten or twelve Iron works in and about the vicinity of Pittsburgh, also at Phoenixville and Reading, Pa., Covington Iron Works, Md., Troy Rolling Mills, and Troy Iron and Nail Factory, Troy, N. Y., where it has given universal satisfaction.

Its advantages over the ordinary Forge Hammer are numerous: considerable saving in first cost; saving in power; the entire saving of shingler's, or hammerman's wages, as no attendance whatever is necessary, it being entirely self-acting; saving in time from the quantity of work done, as one machine is capable of working the iron from sixty puddling furnaces; saving of waste, as nothing but the scoria is thrown off, and that most effectually; saving of staffs, as none are used or required. The time required to furnish a bloom being only about six seconds, the scoria has no time to set, consequently is got rid of much easier than when allowed to congeal as under the hammer. The iron being discharged from the machine so hot, rolls better and is much easier on the rollers and machinery. The bars roll sounder, and are much better finished. The subscriber feels confident that persons who will examine for themselves the machinery in operation, will find it possesses more advantages than have been enumerated. For further particulars address the subscriber at Troy, N. Y.

P. A. BURDEN.

Railroad Spikes and Wrought Iron Fastenings.

THE TROY IRON AND NAIL FACTORY, exclusive owner of all Henry Burden's Patented Machinery for making Spikes, have facilities for manufacturing large quantities upon short notice, and of a quality unsurpassed.

Wrought Iron Chairs, Clamps, Keys and Bolts for Railroad fastenings, also made to order. A full assortment of Ship and Boat Spikes always on hand.

All orders addressed to the Agent at the Factory will receive immediate attention.

P. A. BURDEN, Agent,
Troy Iron and Nail Factory, Troy, N. Y.

CHILLED RAILROAD WHEELS.—THE UNDERSIGNED are now prepared to manufacture their Improved Corrugated Car Wheels, or Wheels with any form of spokes or discs, by a new process which prevents all strain on the metal, such as is produced in all other chilled wheels, by the manner of casting and cooling. By this new method of manufacture, the hubs of all kinds of wheels may be made whole—that is, without dividing them into sections—thus rendering the expense of banding unnecessary; and the wheels subjected to this process will be much stronger than those of the same size and weight, when made in the ordinary way.

A. WHITNEY & SON,
Willow St., below 13th,
Philadelphia, Pa.

Brown's Old Established SCALE WARE HOUSE,

NO. 234 WATER ST., NEW YORK.

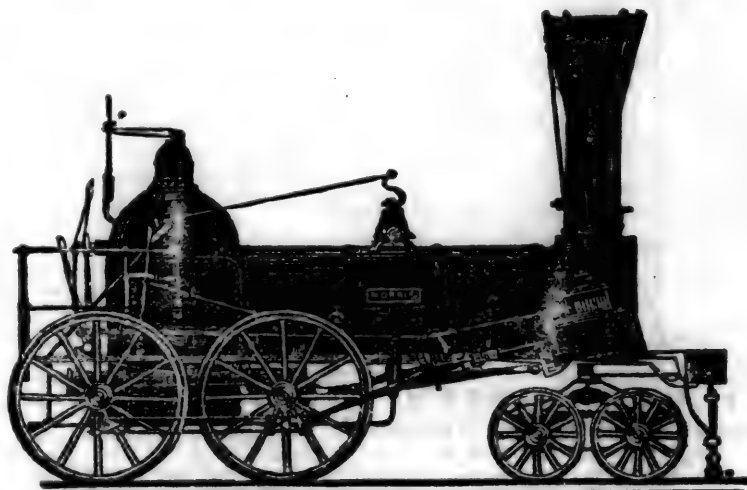
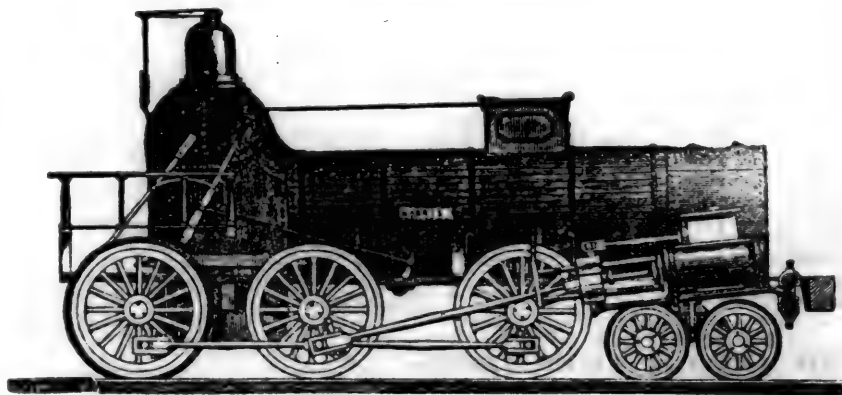
THE Subscriber, Practical Manufacturer of Scales of every description, respectfully asks the attention of Railroad Companies to his Improved Wrought Iron Railroad Track and Depot Scales which for strength, durability, accuracy, convenience in weighing, and beauty of workmanship, are not surpassed by any others in this country.

He is aware that this is rather a bold assertion for him to make, yet he can say with confidence that they have but to be tried to give them precedence over all others.

J. L. BROWN.

Bank Scales made to order, and all Scales of his make Warranted in every particular.

References given if required

NORRIS' LOCOMOTIVE WORKS.
BUSHHILL, SCHUYLKILL SIXTH-ST., PHILADELPHIA,

THE UNDERSIGNED Manufacture to order Locomotive Steam Engines of any plan or size. Their shops being enlarged, and their arrangements considerably extended to facilitate the speedy execution of work in this branch, they can offer to Railway Companies unusual advantages for prompt delivery of Machinery of superior workmanship and finish.

Connected with the Locomotive business, they are also prepared to furnish, at short notice, Chilled Wheels for Cars of superior quality.

Wrought Iron Tyres made of any required size—the exact diameter of the Wheel Centre, being given, the Tyres are made to fit on same without the necessity of turning out inside.

Iron and Brass castings, Axles, etc., fitted up complete with Trucks or otherwise.

NORRIS, BROTHERS

PATENT MACHINE MADE HORSE-SHOES.

The Troy Iron and Nail Factory have all ways on hand a general assortment of Horse Shoes, made from Refined American Iron.

Four sizes being made, it will be well for those ordering to remember that the size of the shoe increases as the numbers—No. 1 being the smallest.

P. A. BURDEN, Agent,
Troy Iron and Nail Factory, Troy, N. Y.

Etna Safety Fuse.

THIS superior article for igniting the charge in wet or dry blasting, made with DUPONT'S best powder, is kept for sale at the office and depot of

REYNOLDS & BROTHER,

Manufacturers, &c.

No. 85 Liberty St.

NEW YORK.

And in the principal cities and towns in the U. States. The Premium of the AMERICAN INSTITUTE was awarded to the Etna Safety Fuse at the late Fair held in this city.

November 3, 1849.

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COLUMBUS, OHIO,

Railroad Car Manufactory.
RIDGWAYS & KIMBALL,

HAVE established at this central point, the manufacture of Passenger, Freight, Gravel and Hand Cars for Railroads, and assure all Western Railroad Companies that it will be their constant aim to procure the best materials and workmen, and to turn out the best kind of work at fair prices. Specimens may be seen on the Columbus and Xenia Railroad. The patronage of Railroad Companies is respectfully solicited.

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To Inventors and Patentees.

OWEN G. WARREN, ARCHITECT, Has had many years' experience as Agent for obtaining Patents, both in this country and Europe, and will transact such business promptly and reasonably. Persons at a distance can have their business done by correspondence—without the necessity of visiting this city or Washington. Office No. 94 Merchants Exchange, Wall st., corner of Hanover st., up stairs.

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AMERICAN RAILROAD JOURNAL.

STEAM NAVIGATION, COMMERCE, MINING, MANUFACTURES.

HENRY V. POOR, Editor.

ESTABLISHED 1831.

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ASSISTANT EDITORS,

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GEN. CHAS. T. JAMES, *For Manufactures and the
Mechanic Arts.*
M. BUTT HEWSON, C. E., *For Civil Engineering.*

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American Railroad Journal.

PUBLISHED BY J. H. SCHULTZ & CO., 136 NASSAU ST.

Saturday, October 26, 1850.

Maryland.

Baltimore and Ohio Railroad.—We find in the Baltimore papers the 24th annual report of this company, from which we make the following extracts, showing the earnings, condition and progress of this great work:

The Main Stem.—It will be perceived by reference to the Treasurer's exhibit, marked B., that a larger amount of revenue has been realized during the fiscal year terminating on the 30th September last, than at any former period of the company's operations, showing the gratifying increase of \$102,599 92, over the exhibit of the 30th September, 1849.

The receipts from passengers, mails and merchandise, have amounted in the aggregate, during the year, to \$1,341,805 27. Of this sum \$395,889 80 have been received from passengers, \$905,967 99 from freight, and \$42,707 48 from the transportation of the mails. The expenses of working the road and keeping it in repair, during the same period, have been \$609,588 85, showing a reduc-

tion under this head of \$35,045 30, a result which could hardly have been anticipated, considering the large augmentation in the company's business, as seen by the report of the General Superintendent, herewith annexed.

The proportion of expenses, will be less than 46 per cent of the gross receipts.

The net revenue of the company will be found to exceed that of any previous year, showing an aggregate of \$734,216 42, equivalent to 10 49-100 per cent upon the original capital of \$7,000,000, and 9 67-100 per cent upon the augmented capital of \$7,588,700, as at present represented.

Of the amount thus stated as the net earnings of the road during the year, the board have declared a dividend of seven per cent, payable in the stock of the company, on and after the 26th of November next.

The Washington Branch.—The operations of the Washington Branch have been satisfactory, and will be found detailed in the Treasurer's exhibit, marked E., showing the receipts for the year ending on the 30th September to have been \$321,201 46, and the expenses during the same period \$113,098 35, leaving the net revenue, after deducting the State's bonus of one-fifth of the receipts from passengers and \$10,607 11, the amount expended on the new station at Washington, \$144,974 03, being an increase of \$31,335 79 over the year ending on the 30th September, 1849.

Of this amount, the board have declared a dividend of 4 per cent payable on and after the 17th inst., which with the 3 1/4 per cent declared in April last, will make a total of 7 1/4 per cent. during the year.

Under the general head of "expenses," will be found various heavy items for the re-construction of bridges, carried away by the flood in October, 1847.

The bonus paid to the state has amounted during the year to \$52,521 97.

The expenses of maintenance and working will be found not to have exceeded 37 per cent of the gross receipts.

Extension to the Ohio River.—The report of the Chief Engineer, herewith annexed, will show in detail the progress of the company's operations west of Cumberland. No efforts have been spared to place the road under contract, and to press forward the work with the least practicable delay.—The board have to regret that a scarcity of labor has prevailed during the greater part of the year just ended, and complaints continue to be made upon the three first sections of the road, extending from Cumberland, 103 miles, to the Tygart's Valley Bridge. Should this state of things continue, the board will find it necessary to take prompt measures to prevent any delay from this cause.

The board of Engineers, appointed by the Executive of Virginia, under the act of 21st of March, have decided in favor of the Grave Creek route, as "the true and proper route under the law of 1847,

and agreement with the city of Wheeling," and their decision being final, the board have directed the Chief Engineer to place the same under contract as soon as proposals can be issued and the necessary arrangements made. The board are not apprized of the ground on which this decision has been based, or to what extent, if at all, the estimates of the Chief Engineer have been called in question.

By reference to the Chief Engineer's report it will be seen, that 167 miles of the road are now in various stages of advancement, and that the commencement of laying the rails, will take place early in the ensuing spring, when the line will progress without interruption to the Ohio river.

There are now employed upon the entire line, 3,500 laborers and 700 horses, and the value of the work done, up to the 30th of September, under the various heads of graduation, masonry and bridging, was \$992,112 40.

Final estimates have been handed in, upon the 3d, 6th, 7th, 8th, 10th, 31st, 35th, 42d, 52d, and 95th sections, 24 additional sections will be finished by the 1st of May next, and the line from Cumberland to the "Piedmont Station," near Westernport, say 28 miles, is expected to be opened about the 1st of June.

All the heavy sections upon Savage river and Crab Tree Creek, are progressing with commendable rapidity, and with every prospect of completion, during the coming spring and summer.

The work at the Kingwood Tunnel has advanced more rapidly than could have been anticipated. Its total length is 4,100 feet. Fifteen hundred feet of the heading have been driven through in a period of five months, being more than one-third of the entire distance. This work it is now certain will be completed, within the limit of the engineer's estimate.

The bridge masonry upon the whole line is in a state of rapid progress, and will offer no obstacle in the opening of the road.

The Chief Engineer expresses great confidence in his ability to meet the expectations of the stockholders, in the prompt completion of the work, should no unforeseen accident occur to retard its progress.

If the laying of the rails should progress without interruption, and according to the plan proposed by him, a junction will be formed with the northwestern turnpike, at the Tygart's Valley Bridge early in the Spring of 1852.

The following we extract from the report of the Chief Engineer:

COST OF THE WORK UNDER CONTRACT.

Graduation and Masonry.—The estimated value of the work at contract prices, was, for the first letting of 20 1-16 miles, \$578,658, at an average of \$28,789 per mile; for the second letting of 24 8-10 miles, \$1,130,370, at an average cost of \$45,338 per mile; for the third letting of 58 7-10 miles, \$441,-

411, at an average of \$7,520 per mile, and for the fourth letting of 63 miles, \$740,314, at an average of \$11,751 per mile. The total for the 167 miles being \$2,890,753, at a general average of \$17,310 per mile—the several rates of cost per mile, very well showing the relative characteristics of the parts of the route successively let. The contracts cover all the work on the sections let, which comes under the heads of graduation, masonry and bridging, except the tunnel masonry and bridge superstructures, which will form a small proportion of the whole cost, and the former of which will not probably have to be provided for until after the opening of the road.

The estimated cost of the work under contract was \$3,633,324, so that the apparent saving thereupon would be \$742,571, or 20 1/2 per cent upon the estimates. How much of this may in fact be realized, it will not be possible to say, until the whole road is completed. The saving will undoubtedly be considerable, as the quantities of excavation and embankment will generally fall within the estimates, and it is hoped sufficiently to compensate for advance of prices upon the abandoned works; most of the work having been let upon approximate location only, on which, by the after and more precise adjustment of the lines for construction, large reductions in the amount of material to be handled were, in many instances, effected.

WORK REMAINING TO BE PUT UNDER CONTRACT.

The line by Grave Creek having been designated for the part of the route heretofore in suspense near the western terminus, there will be 33 sections more to be now let, which, with the 167 sections previously let, will make the whole number of sections from Cumberland to Wheeling, 200, and the distance in miles the same. It only remains, therefore, to call for proposals upon this part of the line, which will be done forthwith; and the whole road will be in progress of construction as soon as the contractors are selected. The 33 miles in question present, as you are aware, a good deal of heavy work, including a tunnel of 2,450 and one of 1,250 feet in length, with many deep cuttings and fillings, and a considerable number of bridges. The sooner therefore these works are in hand the better, that the delay which must attend the construction of the road upon this route may be made as little as possible.

Pennsylvania.

Pennsylvania Central Railroad.—The opening of this road to Johnstown, 280 miles from Philadelphia, was celebrated on the 17th and 18th instant, by an excursion over the road by a large party, composed of the directors of the company; and many of the leading men of Pennsylvania; and by a sumptuous entertainment at Lewistown on the evening of the 18th. We have received an account of the celebration through the Philadelphia papers, but we have room for only a few of the speeches delivered on the occasion, and which will be found below. They will give a good idea of the spirit and feeling manifested. Pennsylvania has quietly, but in a most vigorous manner, been pushing her great work onward to the Ohio, and has already surmounted the great mountain barrier to her progress. Another season will carry her to Pittsburg, when the Ohio and Pennsylvania railroad will be in readiness to continue her line into the interior of Ohio, and by means of the Cleveland and Pittsburgh, form a continuous line of railroad from Philadelphia to Cincinnati. Success to this great line of communication through the heart of the Union.

The first speech on the occasion was delivered by Wm. C. Patterson, Esq., President of the company.

He began by expressing his gratification at the character of the assemblage then before him. It was composed of citizens from all sections of the commonwealth come together to celebrate the advent of a new, and as all hoped and believed, a better era in the commercial history of Pennsylvania. We recognise, said he, in the presence of so many of her sons, including those who have borne

an eminent part in the executive and legislative departments of the nation, or have served her in her own most important civil stations and on the battle fields of her fame—men distinguished not less for personal worth than public merit—the deep interest which Pennsylvania feels in the great work confided to our management, and find a pledge of triumphant success. While we have never, under the most inauspicious circumstances, permitted ourselves to entertain a doubt as to the attainment of that result, we now feel that it is within our grasp. With the eastern division, extending over more than half of the length of the entire route, finished and in use, and the western division, embracing more than two thirds of the residue, under contract—with 3000 men at work upon it, and with the means at hand for its completion, at the earliest practicable period—there remains to be surmounted only the great natural barrier in the way of railroad communication between the city of Philadelphia and the valley of the Mississippi, by the passage of the Alleghany mountains, without inclined planes. We pause for the present at the base of that obstacle as the American army halted before Cerro Gordo, from no uncertainty of purpose—with no doubt or fear as to the result of the onward movement when made—but with a determination so to apply the means which may be at our disposal, that the order of the day shall become the history of the battle. The movement must be made speedily, and will be made successfully. In this the past guarantees the future.—Philadelphia, whose capital has been devoted so freely to this work, and whose interests are so intimately identified with it will keep her broad shoulder to the wheel until it is driven through. Her sister counties of the interior whose vast mineral and agricultural wealth it will develop and bring into profitable use, will come to her aid, and Pennsylvania, whose ability to pay the interest upon the loan contracted in the prosecution of her system of internal improvement was so long, even within her own borders, a subject of dispute, will build the first great link in the Atlantic and Pacific railroad with her own capital, her own labor, and her own material. Col. P. went on to remark that it did not become him to speak of the manner in which this work had been executed; but it was due to the gentlemen with whom it was his good fortune to be associated, to say that an early completion and present profit—though both desirable ends—are not the greatest objects of their solicitude. They regard the permanent character of the work as of paramount importance to all considerations of temporary economy or convenience. They feel that they are building for all time, and they desire to render the structure upon which they are engaged suitable and worthy of the great office it is to perform.—When, continued Col. P., our country shall have fulfilled her glorious destiny, and the stars of that flag, which even now soars above all other emblems of military renown, shall have returned to the heavens they relinquished for the fellowship of its stripes, then, and not till then, will the Pennsylvania railroad have completed its appointed mission, and its iron frame will perish in common with the feeble things of earth. Until then we dedicate it to the uses of the old Commonwealth whose honored name it bears, and to the Union of whose perpetuity and strength it is a type—as a highway for patriotism in war and of prosperity in peace. Col. P. concluded by proposing as a sentiment,

Pennsylvania, rich in everything but a knowledge of her own strength.

Loud calls were then made for Mr. Meredith, who replied in an address abounding in fervid eloquence, which we regret our inability to give in full.

Mr. Meredith said that in the first place he desired to thank his friend who had preceded him, for the sentiments he had so eloquently expressed, of love for Pennsylvania and the Union, and of admiration of the brilliant exploits of our armies in Mexico. He would shake hands with him on those sentiments and his toast. Mr. M. said he rejoiced that for once we had a meeting of Pennsylvanians, who, laying aside for the time all discordant feelings, and forgetting all differences, assembled as Pennsylvanians, to encourage the magnificent en-

terprise which so deeply concerned the prosperity of our commonwealth. Let us hope, said Mr. M., that similar occasions may often occur hereafter. They tend to draw our minds to the consideration of our true position. We are on the last stage of the human race. Beginning in the east, and proceeding always westward, during forty centuries man has performed his tedious pilgrimage; through various climates—on various soils—with various fortunes—through pain and suffering—under oppressions and cruelty—sometimes resting for a while, then urging on his predestined path—often faint and weary—now and again with glimpses of peace and happiness; and at last he has "put a girdle round the earth." From our western shores we look out across the ocean towards the oriental cradle of our race. Our circuit is closed, and here, in one country of vast extent—possessed by one people—who have the instinct of freedom and the habitude of self government—here we find concentrated for our enjoyment nearly all the products of the many climes through which our toilsome pilgrimage has been held—the cotton, sugar, rice and tobacco, fruits, breadstuffs, iron, coal, lead, copper, gold and other metals and minerals. It is almost impossible to name an article that has elsewhere contributed to the wants or the pleasure of man, that is not here, or cannot be produced here, in a profusion unexampled elsewhere: and this vast country is in the possession of one people and is so to remain. No man need talk of disunion. I believe that disunion has never been—is not—and never will be in the hearts of our people. We are too much linked together by interest, intercourse kindred and affection—by the remembrance of past glory—the sense of present blessings—the hope of future welfare—by a common origin and a brilliant destiny—to think of disunion. If we are true to ourselves—if we stand by each other—if we avail ourselves duly of our position—we shall soon have an empire more rich in commerce, manufactures and the arts—more extended—more happy—more prosperous—more powerful than has hitherto been ever dreamed of. The civilized portions of Europe, if set on the face of our territory, would there be but a blot. Such are our destinies, if we choose to fulfil them; and foul fall the man who, according to his opportunity, shall fail to exert himself to promote their fulfilment; for upon it depends the crowning glory and happiness of our race.—Let us be proud, as Pennsylvanians, that our commonwealth is forward in this work. The railroad of which we are now celebrating the opening, is the first link in a communication across our own territory from the tide waters of the Atlantic to the shores of the Pacific. A great enterprise, requiring vast efforts, and leading to vast results—we have begun it and we have a right to glory in it.

Mr. M., after adverting in terms of praise to the various roads proposed to connect with the Central railroad, gave the following sentiment:

The Ohio and Pennsylvania Railroad—the second link in the glorious chain that is to bind together the East and West in bonds of indissoluble harmony.

Solomon W. Roberts, Chief Engineer of the Ohio and Pennsylvania R.R., being called for, responded to this sentiment in one of his usual very interesting speeches. For three years, he said, he had sounded the praises of the Pennsylvania railroad, far and wide, and he was glad to see that it was at length duly appreciated. The opinion of a civil engineer might be worth having, and he could speak professionally and disinterestedly of this road. He had been among the people drumming up subscriptions to its stocks, and he knew the public sentiment to be in its favor. We must raise the money some how to build the new road over the mountain, and the sooner we go to work at it the better. The means must be provided, and we may as well make up our minds to furnish them.

He remarked that he had been the Resident Engineer on the construction of the Portage railroad nearly twenty years ago, and although now that it was to be superseded by a new road, it might be thought he should be ashamed to own it, yet he was not. It was, at the time it was built, a great achievement, and it has been of great service, but it has served its purpose, it has shown what can be done, and now a better road may properly take its

place. But that 40 miles of road by which the Portage is to be avoided, is by far the heaviest of the whole route, and all the rest may be finished before that. Some persons are astonished when told of the time it will take to complete it, but they have not looked at the work to be done.

Again he insisted upon the necessity of raising capital to finish all the sections of this great highway from Philadelphia to the far west. Mr. Roberts then compared Pennsylvania's position geographically with that of Maryland and Virginia with regard to the connection of the Atlantic cities with the great lakes, showing that Pennsylvania is the Keystone in more senses than one.—With regard to the railroad from Johnstown to Pittsburgh, he said that all except twenty miles of it will be completed next year, and those twenty miles the following spring. All this road from Philadelphia was not built merely to obtain the trade of the narrow valley of the Juniata. It was to grasp the trade of the West—the promised land. He was one of the spies returned from that promised land. Philadelphia gives tone to Eastern, and Pittsburgh to Western, Pennsylvania. He hoped that nothing would occur to interrupt the cordiality which should ever exist between those two cities. He counselled Pennsylvania to make haste with her road, and, said he, before you can get your railroad cars to Pittsburgh from Philadelphia, we will have the railroad cars from Cincinnati through to Pittsburgh via Cleveland. This, the Ohio and Pennsylvania railroad company, by its connection with other roads, expect to accomplish next year. A shorter connection, via Wooster and Mount Vernon, will remain to be accomplished. He said that Pennsylvania had no time to lose in the completion of her great railroad. Her rivals were at work both on the north and on the south of her, and the eyes of millions in the west are watching the progress of the contest. The people of Ohio know that the Pennsylvania route is the shortest, they have subscribed large sums to connect with it, and they look with confidence to see Pennsylvania the first state to construct a continuous first class, modern railroad, from the waters of the Atlantic to those of the Mississippi valley. Mr. Roberts said that the location and construction of the Pennsylvania railroad reflects the highest credit on John Edgar Thomson, the Chief Engineer, and the other gentlemen who have had charge of the work.

Mr. R. concluded with the following toast:

The City of Philadelphia—She has planted the seed of the Pennsylvania railroad. May she soon reap the fruit of its final completion in a glorious harvest of prosperity.

IRON ROOF AT THE LIVERPOOL TERMINUS OF THE LANCASHIRE AND YORKSHIRE RAILWAY.

This roof has been erected under the superintendence of John Hawshaw, Esq., engineer to the Lancashire and Yorkshire railway, by Messrs. Fox, Henderson & Co., engineers and ironfounders, of Birmingham. The roof covers five lines of rails and three platforms, and a carriage road 12 yards wide, in one span, having no columns or supports besides the outside walls; the span varies from 136 feet to 128 feet, and the total length is 638 feet. The total area thus covered is 83,457 feet. The material used in the construction of this roof is entirely iron. The framing consists of a series of trussed principles, placed at intervals of eleven feet from centre to centre; these principals are attached to the outside walls by cast iron bed plates or shoes, the whole of which, upon one side of the roof, are so constructed that the principals may contract or expand freely from variations of temperature. Immediately over the principals are fixed wrought iron purlines, which support the covering; this covering is of corrugated sheet iron, galvanized. The roof is both lighted and ventilated along the ridge by four continuous rows of large skylights, and two rows of louvres; half the light is distributed along the ridge, and the remaining half is equally distributed at the eaves; the total area of light admitted being equal to one-fourth of the entire area of the roof. Considering the immense extent of sheet iron in the covering of the roof, it was deemed advisable to make expansion-joints at various places in the corrugated iron.—This principle was also applied to the skylights, and the entire length of roof is thus divided into

several portions, which can contract or expand without impairing the efficiency of the work, as being weather-proof, or destroying its unity of appearance.—*Practical Mech. Jour.*

Stirling's Patent Wrought Iron and Alloys.

In the August number of the Practical Mechanic's Journal, we drew attention to the very valuable results obtained from Mr. Morris Stirling's process for toughening and strengthening cast iron, as a branch of practical improvement in which that gentleman has been eminently successful. As a sequel to our former notice, we have now to introduce to the practical mechanic the several other equally valuable compounds of wrought iron, and alloys of the most costly metals, which have been elucidated in the course of Mr. Stirling's elaborate researches.

For the strengthening of malleable iron, an alloy is made with block or grain tin, the mixture being accomplished in the puddling furnace. The addition of so small a quantity as a two hundredth part of tin, produces a marked change in the appearance and quality of the iron; and a proportion of one hundredth produces a metal which breaks with a crystalline fracture, but works well under the hammer while hot, as well as in the squeezer, the rolls and the smithy, and has a fine smooth surface.—This compound answers admirably for rolling, in combination with common iron, to form the upper surface of rails and for similar purposes, where an anti laminating quality is essential. Bismuth, antimony and arsenic, may in like manner be used, with a somewhat similar effect.

The addition to zinc, whether metallic, or as an oxide or carbonate, as calamine, has also a very powerful effect upon malleable iron, which thus becomes brighter in color, and of a clearer surface, while it retains its ductility and fibrousness. Copper added to the metal thus treated, hardens the malleable iron. A very slight proportion only is used—not more than from a two hundredth to a one hundredth of the mixed iron.

Manganese, mixed with cast iron, gives the resulting malleable iron made according to any of

these processes a more steely character; the black oxide of commerce, in the proportion of one per cent. renders the puddling process more rapid, and gives increased hardness.

The process adopted in the improved manufacture is this: Common iron being brought to a thoroughly liquid state in the puddling furnace, a proportion of from 3 to 4 lbs. of calamine, to every puddling charge of 4½ cwt., is thrown among it, and well incorporated with it. When forged, or squeezed, and drawn through the rolls, it becomes No. 1, or puddle bar, but it is in reality nearly equal in quality to No. 2 of the ordinary iron; and a second rolling brings it up to an equality with No. 3, or best bar, thus effecting an economy in the manufacture to the extent of one entire process. Instead of common iron, No. 3, or No. 3 extra, toughened pig, may be used. Wrought iron made from this is of a remarkably fibrous nature, the fibres being also much finer than when common iron is employed.

By another process, a proportion of from 2 to 4 lbs. of tin, or from 1½ to 3 lbs. of metallic antimony, is added in the puddling furnace to each charge of 4½ cwt. When boiled or puddled, squeezed, and rolled into No. 1, or puddle bar, the product is a very hard, crystalline, or anti laminating iron.—This is admirably adapted for the manufacture of rails and wheel tires. When adopted for this purpose, a pile is made up from three fourths to five sixths of No. 1 calamine iron, and from one fourth to one sixth No. 1 anti laminating iron, the mass being rolled to the requisite section, having the anti laminating metal on the upper surface of the rail, or on the outside of the tire. The junction of the two kinds of metal is quite perfect, as evidence in several specimens now before us. The increase in cost, for securing this vital advantage of an anti laminating quality, is only 7s. 6d. per ton.

The report of the commissioners appointed to inquire into the application of iron to railway structures, furnishes some useful data as to the ascertained strength of the iron, under various tests. The accompanying tabulated statement refers to tensile strength:

Experiments, where made.	Description of iron used.	Average breaking strain in tons per inch square.	Average stretch in a length of 2 feet.			Remarks.
			10 tons.	15 tons.	Final.	
			In.	In.	In.	
Liverpool, by Mr. Jessie Harley.....	Experiments made at Liverpool by Mr. J. Hartley.....	23-23	.....	.....	.....
Average of numerous trials at Woolwich dockyard....	S. C. Crown iron....	24-47	.....	.....	.....
Ditto.....	Dundyvan best bar...	24-33	.....	4	3½	
	1. Dundyvan No. 4 pig iron....46lbs. Wrought scrap. 10 "	27-81	.....	4	5	Very stiff, strong iron, breaking with a long fibre and working well under the hammer at welding and red heat, neither hot nor cold short.
	2. Dundyvan common .4 1 0 Calamine .0 0 4	25-86	.....	4	3½	
	3. Nearly the same as No. 1.....	27-7	.....	1-12	5 3-16	Ditto. This iron is intended for wire drawing, and for other uses, when a ductile soft metal is required. For the wearing surfaces of rails, for tires of wheels and all purposes where a hard, close grained metal is required.
Woolwich dock yard.....	4. No. 2 pig iron, 40lbs. Wrought scrap. 16 "	24-33	.....	9-16	5½	
	cwt. qr. lb. Dundyvan....4 1 0 Tin.....0 0 1	23-39	.....	1-16	4	
	Dundyvan....4 1 0 Tin.....0 0 3	22-92	.....	1-16	4	

* Melted in the eupola and then puddled.

we will be ahead of you in both." To prove Jonathan wrong, we shall have to get up some competition at home, and not wait to be taught the old lesson that there is no such thing in nature as an improving monopoly.

Cunard's company commenced with vessels of 1100 tons, and engines of 350 horse power. They have, step by step, reached 2300 tons and 900 horse power. But the size and power are the only things changed; the model has remained the same. The Asia of 2300 tons is an enlarged edition of the Britannia of 1100 tons, and goes bowling down the Mersey, carrying a sea before her enough to swamp a revenue cruiser.

The American steamers are of larger tonnage and less power than the Asia and Africa, but of exquisite model. They are "ten years ahead" of the Asia and Africa as far as the hulls are concerned, and as far behind in the engines. They slip down the Mersey with scarce a ripple at the bow, dividing the water like a Gravesend steamer. In accommodation, ventilation and general arrangement, the American vessels are superior to anything that has been before seen in this country.

It will doubtless be said that we attach too much importance to the success of our trans-Atlantic cousins. We shall be told that "one swallow does not make a summer; one extraordinary passage is not a fair criterion." We shall be advised to wait for a twelve month before we give an opinion. In spite, however, of these and other wise saws that may be poured out, we confess that to us the voyages of the Atlantic and the Pacific look like "the handwriting upon the wall" to our rulers, which it behooves them to lay to heart.—*London Chronicle*.

The results which are to follow the issue of this contest are well stated. Success secures to the winning nation the first rank in the scale of influence and power, and the contest for superiority in a merchantile marine, is a contest for political supremacy as a nation.

Our first essays are admitted to equal the matured experience of England. The model of our ships are confessed to be vastly superior. If their machinery is inferior, which the result proves is not, all we want, to excel as much in the latter as the former, is experience alone. In ship building we have this experience; hence our superiority here. The construction of machinery for sea going vessels is of very recent date, and this work till within a very short time has been monopolised by our rivals. Give us an equal experience, and we shall leave the English steamers as far behind in the excellence of machinery as we do now in the construction of the ship.

Success on our part is the legitimate result of operating causes. Our mechanics are a much better educated (using that term in its most extensive sense) body of men than the same class in England. Labor with us is considered more universally respectable than in that country. Our greater freedom gives us a greater versatility of character, and a more inventive genius. The labors of our engineers are seconded by a vastly more intelligent body of laborers, which is one secret of our success. The English merchant ships bear no comparison to the American, either in model, sailing qualities, management, comfort, or neatness. The masters of our packet ships are gentlemen in every sense of the word, which can be said of very few English captains.

England has been the foremost nation in the world not by virtue of numbers, but by virtue of her intellectual and moral superiority. Her contracted limits forever forbid a large population.—England is here reproduced on a vastly broader scale, with every condition of greatness, and freed from every incubus which weighs so heavily upon the old country. Our people are the same in kind, but vastly greater in degree, than the English.—

We have the same materials to work with, only a vastly more of it. We are as certain in time to take the precedence, as our country is more extensive and richer in all the elements of greatness.

Internal Improvements in the State of New York.

A Sketch of the Rise, Progress and Present Condition of Internal Improvements in the State of New York.

NUMBER I.

Continued from page 644.

In their annual report in 1824, the canal commissioners announced the completion of the Champlain Canal, and 280 miles of the Erie, and that both canals, in the navigation season of 1823, produced a toll of \$153,099 43. They also state that "certain citizens of Black Rock having made us a proposition to contract for the construction of a harbor at that place, in all respects conforming with the requisitions of the act of 1822, we accepted it;" that a contract had been executed with the Black Rock Harbor company, to construct a harbor for the sum of \$95,819; and that 95 rods of mole, and 260 rods of embankment, had, at the date of the report, "already been completed."

The decision caused much dissatisfaction among the inhabitants of Buffalo, and a bill was brought into the Assembly "to provide for the permanent supply for the Erie Canal west of the Genesee river," which contemplated an overland canal, without entering the river at Black Rock, and thus taking the water into the canal from the level of Lake Erie at the mouth of Buffalo Creek. This bill was referred to the canal committee, of which A. C. Flagg was chairman, together with a resolution instructing the committee "to call for opinions and explanations on all the canal commissioners, as well as all the engineers, who have been at any time employed by the commissioners to make examinations or reports in relation to any of the points within the scope of the present inquiry." In pursuance of this resolution, Mr. Clinton appeared before the committee, and made a verbal statement in favor of terminating the canal at Buffalo, and Mr. Holley another in justification of the decision of the commissioners. These statements were subsequently reduced to writing, and, together with the reports of the engineers, are printed in vol. 2 New York Canals, page 518.

The Black Rock Harbor is formed by connecting Bird and Squaw Islands by a mole, or pier, 530 rods in length, 18 feet in breadth, and 16 feet in height. To this is added an embankment on Squaw Island, 260 rods long and 8 feet high. A pier, 30 rods long, connects Squaw Island with the main shore, a little below where the canal enters the basin. Through this pier is a ship lock, for the passage of lake vessels. The harbor covers an area of 136 acres; and Mr. Geddes, who planned it, at one time contemplated the construction of a mole from Bird to Grand Island, and, in this way, making a harbor of 15 miles in length.

Although it was decided to take the water for the canal from the harbor at Black Rock, it was also determined to construct an overland canal from near the upper end of the harbor to Buffalo Creek. The canal committee, in their report, say "they are well satisfied that the canal which is to connect Black Rock and Buffalo harbors, ought to be finished; and that it would be injudicious to interfere with the decision of a majority of the commissioners, or disturb the contracts made for the construction of the basin at Black Rock. These conclusions were approved by the Assembly.

When the pier was finished in October, 1825, the water rose in the basin within a few inches of the level of the lake, and flowing into the canal, gave a depth, throughout its whole extent to Lockport, of from five and a half to six feet above the bottom of the canal, as surveyed by David Thomas.—"This volume of water," say the commissioners in their report of 1826, "drawn eastward by the declivity in the canal of an inch in a mile, will be sufficient to supply the Rochester level, and probably the canal as far eastward as the Cayuga Marshes, without any aid from the Genesee river." The opinion is fully borne out by the test of experience. And when the canal is enlarged, it is confidently believed that there will be no difficulty in

supplying it with water from Lake Erie as far as Seneca river, a distance of 150 miles.

The estimates of the canal commissioners, in regard to the stability of the pier at Black Rock, and its influence in raising the water to the level of the lake, have been substantially realized. A valuable water power has been created at Black Rock for mills and machinery, the use of which, in the dry seasons, counteracts, to some extent, the flow of water for the supply of the canal. Those who anticipated in 1824 that the commerce of the lakes would concentrate in the harbor of Black Rock, and enable that village to rival Buffalo, have not realized their expectations. Buffalo, on the contrary, has increased from a population of less than 5,000 in 1824, to 30,000 in 1845; and its trade has increased in a much greater proportion.

Acts were passed in 1824 for surveying the route of a canal from the St. Lawrence to Lake Champlain; for the sale of Grand Island; and for a loan of one million of dollars, "for the completion of the Erie and Champlain Canals;" for draining the Cayuga Marshes, and examining the route from Montezuma to Geneva, "with a view to the improvement of the navigation from the Erie Canal to the Seneca Lake;" also a resolution to make a canal between Fort Edward and Fort Miller, where the Hudson river was used as a part of the Champlain Canal. And another, on the motion of Mr. Dudley, of the Senate, directing the commissioners of the canal fund to prepare a digested system for the regulation and management of the canals. A joint resolution was also passed, protesting against the demand, on the part of the United States, that boats navigating the canals should take out a license, and pay tonnage duties.*

On the last day of the session of 1824, De Witt Clinton was removed from the office of canal commissioner, by a vote of 21 to 3 in the Senate, and 61 to 34 in the Assembly. General Van Rensselaer was made president of the board of commissioners.

An election for Governor took place in the following November, and Mr. Clinton was chosen by a majority of sixteen thousand. In his annual message, in 1825, Governor Clinton recommended "a board for the promotion of internal improvements, with authority to consider and report on all subjects relative to the establishment of communications by land and water; by roads, railways, canals, bridges, and water courses, and with a general superintending power over their construction." After alluding to the union of the lakes and the Atlantic by the Erie and Champlain Canals, the message said:—"The next leading object is to unite the minor lakes and the secondary rivers with the canals;" and he recommended to the favorable consideration of the Legislature, seventeen different routes for canals, and a state road through the southern tier of counties.

The important and comprehensive recommendations of the Governor were referred to a joint committee of the two houses, Mr. Dudley being chairman of the Senate committee, and John W. Hurbut of the Assembly. This committee reported in favor of a board of commissioners, whose duties should extend to all subjects relating to internal improvements, except as to the canal revenue; and on this subject they recommended the continuance of the commissioners of the canal fund, and that they have power to appoint collectors of tolls, who shall give security to pay quarterly, or oftener, if required, the moneys collected by them.

A bill was introduced in the Senate, which became a law, authorising a survey of the several canal routes recommended by the governor, and an estimate of the cost of construction; and the sum of \$12,500 was appropriated to pay expenses.—Laws were also passed authorising the construction of the Cayuga and Seneca Canal; for connecting the Erie Canal with the waters of Lake Ontario; for altering the route of the Champlain Canal between Fort Edward and Fort Miller; and authorising the canal commissioners, if they deemed it necessary, to construct an overland canal along the margin of Black Rock Harbor.

* The Delaware and Hudson Canal Company, which was incorporated in 1823, obtained authority, in 1824, to use half a million in banking in New York.

The annual report of the commissioners of the canal fund takes strong ground against the diversion of the canal revenues to any other purpose than the completion of the Erie and Champlain Canals, and the payment of the debt created in constructing these works. It alludes to the payment of \$7,000 from the fund on account of the survey of other canals, as an infraction of the constitutional provision. It says:—"Sound policy concurs with the faith of the state, and the requirements of the constitution, in restraining the Legislature from increasing the debt created for opening 'navigable communications between the great western and northern lakes and the Atlantic Ocean,' by adding to it any expenditures for other canals, and from appropriating directly, or indirectly, any part of the canal revenue towards these expenditures, until the debt created in constructing those navigable communications shall be paid. The constitution has guaranteed this fund to this sole purpose, and has thus placed it beyond the power even of the Legislature itself."

The report estimates that the revenues of the canal fund will keep the canals in repair, pay the annual interest, and redeem the principal of the debt in about ten years from the completion of the canals:—

It estimates the yearly average amount of tolls at.....	\$700,000
Auction duties.....	250,000
Salt duties.....	170,000
	\$1,120,000
Interest.....	\$410,000
Expenses of repairs.....	100,000
	510,000
Annual surplus applicable to debt..	\$610,000
The debt was stated at.....	\$6,602,092 54

According to the estimate made in the report of 1825, the canal fund would reimburse the principal of the debt in January, 1836. The sum necessary to redeem the debt was actually provided and set apart for the purpose in July, 1836; differing only six months from the estimate made ten years previous.

The report of 1825 closes as follows:—"From the views taken by the commissioners, it appears reasonable to indulge the hope that within the space of ten years the canal debt may be extinguished; and this copious stream of revenue, yielding, according to the most moderate estimates, an annual income of more than a million of dollars, may be turned into the treasury, and the government be thereby enabled to remove from the people the burden of taxation; to diffuse the blessings of education in a more abundant manner than at present, and to carry forward this state with increasing progress in its career of general prosperity."

The report was written by Governor Marcy, and signed by Lieut. Governor Tallmadge, J. V. N. Yates, Simeon De Witt, Samuel A. Tolcott, and A. Keyser, Jr.

Another very important report, also written by Governor Marcy, was made at the same session, and signed by the same officers, in relation to a system for the regulation and management of the canals. Preparatory to making this report, the acting canal commissioners, and the collectors of toll, were desired to give their views in regard to the proper regulations for the superintendence of the canals, the collection of tolls, the disposition of surplus waters, the rates of toll, the mode of ascertaining the weights of cargoes, preventing or detecting frauds, and any other matters in regard to the management and police of the canals. Answers were received from commissioners Bouck and Seymour, giving, in ample detail, the results of their experience on all the points referred to, and also from John B. Staats, collector at Albany, B. B. Hyde, Rome, David S. Colvin, Syracuse, R. Matson, Mentz, John Adams, Lyons, and James Seymour, Brockport.

On the 26th of October, 1825, eight years and four months from the time of its commencement, the Erie Canal was completed. Extensive arrangements had been made at New York, Albany, and through the entire line of the canal to Buffalo, to celebrate this auspicious event. It was before the present mode of communicating information with

the rapidity of lightning has been made known to the world, and a telegraph was arranged for the occasion by stationing pieces of ordnance at suitable points along the whole line, so that a signal gun could be fired when the boats should move from the lake into the canal at Buffalo, to be repeated from station to station. The plan was so well executed that in one hour and thirty minutes from the firing of the first gun at Buffalo, the echo was heard in New York; and a response was sent back through the same process. The canal boat Seneca Chief, with Governor Clinton, Lieut. Governor Tallmadge, and various committees on board, reached Albany on the 2d of November, and New York on the 4th. "Every city and village," says Colonel Stone in his account of the celebration, "had prepared its festival, and throughout the whole line, from the lake to the ocean, it was a voyage of triumph." When the fleet which came down the Hudson joined by the reinforcements in New York, reached Sandy Hook, Governor Clinton proceeded to perform the ceremony of commingling the waters of the lakes with the ocean, by pouring a keg of that of Lake Erie into the Atlantic; upon which he delivered the following address:—

"This solemnity, at this place, on the first arrival of vessels from Lake Erie, is intended to indicate and commemorate the navigable communication which has been accomplished between our Mediterranean seas and the Atlantic Ocean, in about eight years, to the extent of more than four hundred and twenty-five miles, by the wisdom, public spirit, and energy of the people of the State of New York; and may the God of the heavens and the earth smile most propitiously on this work, and render it subservient to the best interests of the human race."

The Great Telegraph Case.

U. S. Circuit Court—Boston.—In the case of F. O. J. Smith & al., representing Morse's patent, Judge Woodbury yesterday delivered an opinion against the injunction prayed for by the plaintiffs. His honor proceeded to construe the patent of Mr. Morse, which he did in a manner to sustain its validity, viz., that the claim of the principle, or the use of the motive power of electro magnetism, must be understood as being in combination with the machinery by him invented. To give it a broader signification, his honor said would be to make void the patent of Mr. Morse. Having determined the construction of the patent, his honor proceeded to consider and comment on the evidence contained in the record, and after briefly considering the numerous European telegraph, electric and galvanic, which were invented during the last century and the present one, (including Soemering's, Ronald's Schilling's, the one at Madrid, and others,) his honor proceeded to comment on the attempt of Coxe, in America, and after on the electric recording telegraph, invented by a son of Massachusetts, at Long Island in 1828, Mr. Harrison Gray Dyer, which he characterized as of remarkable ingenuity, as, in the application of the idea of time in regulating the space so as to compose an alphabet, and the first American who had succeeded in this purpose of recording, although the system he used differed some from both House and Morse. The experiments of Prof. Henry, at Albany, also anterior to Morse's attempt, in which he endowed the electro magnet with power equal to raising the weight of a ton, and obviated the great difficulties which had lain in the way of using electro magnetism. These all preceded the passage on board the ship Sully, in 1832, when Mr. Morse and Dr. Jackson conversed on the subject, and when Mr. Morse commenced his labors. After following down the various inventions and labors of Steinheil, Gauss, Alexander, Weber, Cook and Wheatstone, on the telegraph, to the date of Morse's application for patent, in 1837, his honor remarked that something was wanted in all these to produce a result perfect for practical use; that, among the sixty competitors who had labored for this end, Morse appeared to have got the most practical and perfect machine. The combination of the pen point and the machinery to move paper, with the telegraph, his honor thought to be that desideratum and the essential point in Morse's invention.

His honor said that Mr. Morse and his assignees would be protected in the method of telegraph-

ing claimed by Mr. Morse. The pen—a most happy thought; the rollers and papers, a most important thought; and the stenographic alphabet, the crowning thought; and any infringement on the things described, &c., would be punished.—Whilst Morse is thus secured, the same latitude is left open for his successors to invent, as was accorded to Morse in improving on his many predecessors.

Now has this patent been violated by the defendants? The defendants insist they have used nothing which was not open and public before the date of Morse's invention. Whilst shielding the public in this right, we must not allow any one to use the inventions of Morse without his assent. House's machine appears much unlike Morse's, and in its work differs in using two new powers. Whilst Morse's is simple, that of House is so complicated as to require days of attention by mechanics to understand. Whilst Morse's is speedy, House gives lightening to Roman letters; his speed of breaking and closing is much greater than Morse's, and without this greater speed he could not accomplish his object. This is not the same system as Morse's and is more like that of Alexander.

Morse's machine traces the signs intended; the type or the lever at one end do so, and the pen at the other also. House's machine does not do this.—It acts at both ends by signals, and traces nothing. This new power of axial magnetism, the invention of which is claimed by Mr. House, aids in transferring this so as to have it printed, and the U magnet of Morse would be utterly inefficient for this purpose. House's is a signal and printing telegraph, and Morse's is a writing telegraph. The electro magnetism between the two points has been used long before Morse, and therefore no infringement of his invention. House produces in his machine new results, and cannot be considered as an equivalent for Morse's, as he uses neither the pen, the lever, nor the stenographic alphabet to translate the signs, as appears from the testimony of Prof. Henry, Dr. Jackson, Prof. Hare, Col. Burden, Hibbard, Channing, etc. His honor then commented on the originality and novelty in House's machine of the axial magnetism and the use of the air tubes and condensers, and expressed himself astounded, in examining this case, to find that so much which he had supposed to have been near an original in telegraphing, was not of late origin or derived from Mr. Morse, as electro magnetism, wires, etc., but that inventions of Morse lay in a different place from what he had formerly supposed.

Morse's leading novelties, his honor thought were—1st, the local circuits; 2d, writing at a distance by electro magnetism. 3d, the stenographic alphabet. Neither the electro magnetism, or the Roman letters, or the printing apparatus were invented by Morse. The local circuits, and the stenographic alphabet were not used by House, or the writing, &c.

The opinion of the experts who testified in the case, as to the principles of the two machines stood thus—Mr. Morse, who was not regularly educated to mechanics, and whose profession was that of a portrait painter; and, besides him, Mr. Foss, his assistant, who, until a few years past, had been employed only as a grocer and baker alone, regard this as an infringement. On the other hand, a numerous body of experts in mechanics—some twelve or fourteen—embracing some of the most talented men in the country in their professions, unite in opinion that this machine of House's is no infringement. Some of these gentlemen say the two machines are as much alike as a goose quill and a printing press.

His honor said, he thought the difference of opinion of Mr. Morse and Foss from the rest of the experts, arose from their attaching a wrong meaning to the word 'principle,' as used in patent law, and that, setting aside the battery and wires, &c., which were public long before Morse began to invent, there could be no question of it. The public had the same right to make and re-employ the old modes, the same privilege to make improvements as Morse had in 1832. His honor said, on considering the whole, I do not think the plaintiff entitled to an injunction. His honor expressed his sense of the weight due to the decision of Judge Monroe, of Kentucky, against O'Reilly, but thought it did not apply in this cause, and said that his ex-

amination of the evidence in this cause had impelled him to take the views of the subject he had stated, and which if wrong, he felt gratified it was in the power of another and nigher tribunal to reverse.
—Post.

Form of the Blast Furnace.

Sir—I am aware that the old form of blast furnace with flat boshes was considered to give a necessary support to the materials, and the assertion has been received as a truth, without any particular inquiry into the fact. But I think this opinion may easily be seen to be an error in every case, and that they never afford any greater degree of support, though a great deal of obstruction. If a perpendicular is erected from the edge of the hearth in the section of a furnace of this construction, until it meet the side wall of the lining, a triangular space will appear, forming in the filled furnace a prism of materials, the base resting on the boshes, so that as the mass tapers upwards, the smallest possible quantity of matter is supported. If another line is drawn upwards from the same point, at an angle representing the course of the rushing blast in its expansion, a second prism will be displayed, lying behind, out of the direct action of the blast, in which dust, and all the semi-liquified requisites for scaffolding, used to effect a comfortable lodgment. This line, in a properly constructed furnace, will coincide with the lining; and if the first line be erected in the section of such a furnace, sufficiently widened above the boshes, a space will appear, which, taken in connection with the wider diameter, exhibits fully three times the cubical contents, as being supported by the boshes, and bearing directly upon the centre of motion. The truth is, it was discovered to be necessary to have the furnace of considerably wider diameter than the hearth, in order to prepare the materials; that enlargement was obtained in the way most convenient to the builder, without the least reference to principle, and its defects perpetuated by imitation. In Mr. J. Gibson's pamphlet *On the Construction of the Blast Furnace*, he details the observations which led him to question the propriety of this form of structure; and having matured his views, he staked them on the construction of an entirely novel furnace, taking the action of the blast as his guide. The bold experiment proved most successful, effecting a saving of 30 to 50 per cent. in the fuel alone. His plans soon became general in Staffordshire, and are spreading throughout the kingdom, but in very numerous cases by the mere force of imitation, with as little knowledge of the origin and principles of the improvement as had previously existed regarding the meaning and demerits of the old construction. DAVID MUSHET.

Gas from Water.

This great desideratum has been found at last, though the means by which the gas is obtained from the water is more expensive than the method which Professor Payne was supposed to have discovered. The proprietors of the Astor House have been using this gas for the last two months. The light, they inform us, is much superior to that obtained from the common gas, with which the whole city is supplied, while the expense is less than one-half. The apparatus, which is set up in a small building at the rear of the hotel, is very simple in its construction, requiring only the attendance of two men, who, in seven hours, can turn off sufficient for twenty-four hours consumption. The following is, as near as we could ascertain, the process by which the gas is produced:

The water used in its manufacture is discharged from a can in limited quantities, into a pipe passing through the retort. This retort is kept constantly supplied with iron and charcoal, the intense heat from which converts the water, in its passing through the pipe, into steam. The steam thus formed is amalgamated with liquid rosin of which there is always a large supply kept in a boiler placed immediately over the retort, so that the gas is obtained simply from the combination of steam generated in the manner described, and the liquid rosin. The volatile oil produced during the manufacturing process is discharged through a separate pipe into receiving vessels. This oil is disposed of at half a dollar per

barrel. The expense of the charcoal and iron consumed is very slight, and the amount of rosin required is about a barrel and a half.

The apparatus was put up by the Union Gas Light Company, which has its head quarters in Jersey City. The stock of this company has been taken up and the present capital is about \$500,000. The President is Mr. George M. Danforth, and the Secretary Mr. Giddings. The whole of Jersey City, it appears, is to be lighted up with this gas, and the company has already entered into contracts for lighting several hotels in the different cities of the Union.

STATISTICS OF GAS IN ENGLAND AND WALES.

There are now in England and Wales 560 proprietary gas works, and Ireland and Scotland 170. Besides these there are thirty-three which belong to private individuals, and twelve the property of municipal bodies or parish officers; in all, 775 distinct establishments for the manufacture and sale of gas. In these works a capital of £10,500,000 is said to be invested. The quantity of gas annually produced is about 9,000,000,000 cubic feet, and the coal consumed in making it weighs 1,125,000 tons. The number of persons employed in its production is about 20,000; and probably an equal number finds employment in the preparatory work in the mines, iron works, and other processes connected with it. After allowing for waste and leakage, the quantity of gas actually sold to the public in the year is about 7,200,000,000 feet, producing a light equal to what would be given out by 32,133,640 gallons of sperm oil; which, at eight shilling a gallon, would cost the consumers £13,223,456. The gas itself is charged by the companies about \$1,620,000.—C. E. & A. Jour.

The Coal Trade.

The following is stated to be the probable receipts of anthracite coal for the year ending Dec. 1, 1850.

Coal sent to Market to Sept. 26, 1850.	
Reading Railroad.....	tons. 894,389
Schuylkill Navigation Company.....	288,030
Lehigh region.....	502,245
Lackawanna region, about.....	300,000
Wyoming ".....	50,000
	2,044,662

Probable amount to be sent, provided no accident occurs, before Dec. 1.

Reading railroad, 8 weeks, at 45,000 tons per week.....	360,000
Lehigh region.....	150,000
Lackawanna region.....	200,000
Wyoming region.....	40,000
	750,000

Amount in tons for 1850.....	2,794,662
Amount sent to market from same sources in 1849.....	3,200,000

Decrease in 1850, without allowing for increased consumption, which competent persons estimate at 200,000 tons..... 405,338

Ohio.

Cincinnati and Belpre Railroad.—We copy from the Scioto Gazette the following exhibit of the financial condition of this company:

Cincinnati loan, Hillsboro' section.....	\$100,000
" " east of Hillsboro'.....	150,000
Highland county, individual subscription.....	60,000
Greenfield and Frankfort individual subscription.....	175,000
Ross county subscription.....	100,000
" " individual subscription.....	55,000
Athens " subscription.....	100,000
	\$740,000

In addition to the above, there is a large individual subscription along the line of the Hillsboro' and Cincinnati section, nearly sufficient to pay for the grading of that section—but how much, exactly, we do not know. The gross amount, subject to

the use of the work as the funds may be needed, is now hardly less than eight hundred thousand dollars.

We estimate that the following additional subscriptions may be depended upon, within the next twelvemonth, to follow the vigorous prosecution of the work of obtaining them, to wit:

Washington county subscription.....	\$300,000
Vinton county ".....	100,000
Individual subscriptions, along the line, \$50,000 in each county east and inclusive of Ross.....	150,000
	450,000
Add the above.....	\$800,000

And the grand total is.....\$1,250,000 for the grading and masonry of the whole line.

We may add that the directors are determined to leave nothing undone to fulfil their own desires and reasonable expectations of the public, in the energetic prosecution of this great work.

Pennsylvania.

Schuylkill Canal.—The Philadelphia North American says: The repairs on the line of the Schuylkill Navigation are being pushed with the greatest vigor. The water has been let into the Canal between this city and Oaks Outlet Lock, 4 miles below Phoenixville, and by the 1st of November the water will be let in as far up as Reading.—The damage from Pottsville to Lord's dam, above Port Clinton, will be repaired by the 1st of December, and no doubt is entertained of the ability of the company to have the repairs completed so as to resume business at the opening of navigation in the Spring.

Hanover Branch Railroad.—The people of Hanover and vicinity are moving in the construction of a branch road, leaving the Baltimore and Susquehanna at Smyser Station, 11 miles south of the town of York, and running to Hanover, a distance of 12½ miles. The cost of this branch is estimated at about \$100,000, towards which \$75,000 have already been subscribed. The balance it is proposed to raise in Baltimore. The road would run through a country affording a large business, and would become an important feeder to the Baltimore and Susquehanna.

The following gentlemen are President and Directors:—Jacob Wirt, President; Jacob Dallone, Jacob Young, Jacob Ferney, Samuel Diller, Philip Color, Directors.

Massachusetts.

Lowell and Lawrence Railroad.—William Livingston, Sidney Spalding, Otis Allen, Frederick Parker, Horace Howard, Isaac Farrington and Abner W. Buttrick, were on Monday chosen directors of the above corporation. Wm. Livingston was subsequently elected President; John A. Knowles, Treasurer; and Frederick Parker, Clerk.

Maryland.

Baltimore and Ohio Railroad.—The board yesterday declared a dividend of four per cent. on the Washington branch, for the last six months, payable on the 17th instant, and on the main stem a dividend of seven per cent., payable in stock, for the last year, payable on the 26th of November next.

New York.

Ogdensburg Railroad.—The directors of the Ogdensburg and Lake Champlain road have decided to carry flour in the quantity destined for Atlantic seaports, at 25 cents per bbl. The lines of railway between Lake Champlain and Boston, have likewise agreed upon a through tariff from

Burlington to Boston of thirty-five or thirty-six cents per bbl., for flour. The lake transportation will be four cents to the barrel, making in all, fifty-nine or sixty cents from the St. Lawrence river to Boston.

AMERICAN RAILROAD JOURNAL.

Saturday, October 26, 1850.

Great Work on Bridge Building, etc., etc.

JUST published in medium folio, One Dollar, 75 cts. to subscribers.

Part II of a "THEORETICAL AND PRACTICAL TREATISE ON THE CONSTRUCTION OF BRIDGES IN STONE, IRON AND WOOD," including the Equilibrium of Arches, the mathematical principles of the Oblique Arch, Suspension Arch, etc., Construction of Foundations in Water, Centering, Oblique Arches, etc., the application of Iron to Railroad Structures, Practical Tunnelling, Suspension Bridges, etc.; illustrated by numerous accurately executed Plans, Elevations, Sections and Details of Stone, Iron and Wood Bridges, Viaducts, Tunnels, Culverts, Machines, etc., constructed by the most eminent Architects and Engineers in Europe and the United States, and numerous Original Designs for Bridges, Viaducts, Culverts, etc. The whole calculated to meet the exigencies of Engineers, and assist Draughtsmen, Bridge Builders, Mechanics and Students. By George Duggan, Architect and Civil Engineer.

The present part contains beautifully executed plans, elevations, sections, and details of the Cast Iron Oblique Arch, 100 feet span, constructed on the system of M. Polonceau, over the Canal St. Denis, Gt. Northern R.R. of France, also plans, elevations, sections and details of a Timber and Iron Truss, 74 feet span, from St. Mary's Viaduct, Cheltenham and Great Western R.R., England, and a Wrought Iron Girder Bridge, 120 feet span, constructed for the London and Blackwall R.R., with the conclusion of the introductory article on the relative merits of the various forms of construction adopted, and materials employed, as regards economy, strength and durability.

Published by George Duggan, 300 Broadway, New York, to whom all communications should be addressed and subscriptions forwarded.

Parties remitting Mr. Duggan \$5. and the remainder \$4 when they have been supplied with the first six parts of the "Theoretical and Practical Treatise on Bridge Building, etc.," shall receive it monthly as published. To those making Mr. Duggan a present remittance of \$9, the work will be forwarded post free to any part of the United States.

TO RAILROAD COMPANIES, CAR MANUFACTURERS, etc.

THE Undersigned hereby gives public notice, that the Commissioner of Patents, pursuant to his decision in relation thereto, on the 8th day of October, 1850, issued to him a Patent for the sole right to manufacture, and exclusive use of the INDIA RUBBER CAR SPRING, on account of priority of invention of said Spring. F. M. RAY.

New York, Oct. 23, 1850.

Illinois.

We learn that the agent of this state has called the attention of its creditors to the importance of taking some step in relation to the recent grant of land by Congress, for the completion of the Mobile and Chicago railroad. Mr. Wadsworth suggests that the creditors of the State should take some action in the matter—either by forming a company for the building of the road, receiving the lands as a bonus, the indebtedness of the State to be receivable for the lands when sold—or to make a loan to the State for the purpose of building the road, in proportion to the bonds held, as the creditors of Indiana did to that State for the completion of the canal. The amount of indebtedness of Illinois, not including the registered Illinois and Michigan Canal bonds and arrears of interest, is about eight million of dollars. So that a loan of twenty-five per cent by the holders of these bonds, with the proceeds of the lands as sold, it is believed will be sufficient to build the road.

European and North American Railroad.

It is stated, and upon good authority, that the British government will grant aid to the Lower British Provinces in the above project. We have no doubt that it will heartily encourage this work, which cannot fail to exert the most beneficial influence upon Ireland, and their provinces on this continent, in addition to what it will accomplish in shortening the line of travel between the old and new world. If the whole line of travel between Europe and America could be turned through Ireland, it would do more to improve her condition, educate her people, and consequently strengthen the bond of union between herself and England, than all other influences which can be brought to bear.—Legislation can never do much for any people. By it, a nation cannot be made wise, industrious, nor rich. Wise laws are but the expression of an intelligent people. They are a sequence, not a cause. Ireland has had a plenty of legislation, and under its influence, her island is being fast depopulated. Her salvation must come from an improvement of the character of her own people. They must be educated. Ideas must be introduced among them. The constituting her a great thoroughfare of travel will necessarily bring with this improvement educated men to superintend her works. Their construction will create a demand for all her products, and lead to the development of all her resources. New towns will grow up. The means of intercourse and travel thus furnished will render Ireland an agreeable country for a permanent residence. Every educated man will not then flee to England, with what money he can wring out of the poor tenantry, and carry with him not only all the property, but all the intelligence of the country, and leave behind him total darkness. Ireland will thus retain within herself what she is entitled to retain, her educated classes, and the earnings of her people. In addition to this, every person who will pass through this country will, to a certain extent, serve the office of school master; for every person will leave behind him an impression or remembrance of his qualities or characteristics. All who are brought in contact, will learn something from them. A railway too, is one of the greatest of educators. No man can fully understand the machinery of a locomotive, without having his intellectual range vastly enlarged.—A few lessons like this, will do more to disenthral man from the bondage of tradition and superstition than all the theories and maxims ever written.

The advantages of this railroad to Ireland will be fully appreciated by the English government, and will, we have no doubt, be hailed as a God-send in the present crisis of the Irish affairs. What will prove true of Ireland, will, to a certain extent, be the case with the British Provinces in this country. The condition of these provinces, in consequence of the free trade policy of England, has for a few years past, as far as trade and commerce is concerned, been but little better than that of Ireland. A widespread feeling of discontent, and a desire to separate from the home government has been the consequence. Far removed from England, and shut out from the United States by a high tariff, their trade has dwindled to almost nothing, and instead of being as they are entitled by position to be, the most flourishing part of this country, they are the least so. This great work, therefore, is the only thing that can infuse life in them; and with it, they are certain to become rich, contented and flourishing. England cannot make use of any means which are so certain to heal the discontents, which

so disturb her peace, and which have threatened so many times to involve her in a war. For a very small sum she can put in operation causes which shall provide for these an effectual cure.

To this country the project is important, in shortening the time, and in diminishing the expense of a voyage to Europe. It is necessary too, to give our system of railroads their full efficiency. When all our roads shall be connected, every mile of new road built is so much added to the value of each line. One system will not be complete till every part of the country shall be penetrated.

Decision of the Great Telegraph Case.

The decision of Judge Woodbury in the case of the alleged infringement of Morse's patent, is not only a matter of general congratulation, but is in harmony with plain common sense. It would be the greatest outrage ever committed upon private right, that one man should be allowed the monopoly of using electricity, as a means of transmitting intelligence, by whatever contrivance made use of. It would be conferring more power than any one man ever possessed. The field is now left open to honorable competition. Each man will be protected in his own invention, but no one will enjoy the exclusive right of the great agent employed, electricity. This competition, while it will constantly improve the modes by which intelligence is to be transmitted, it will bring down the cost of telegraphing to a reasonable limit.

Improvement in Railroad Property.

Never in the history of railroads in this country, has there been so general and marked an improvement in their earnings as during the present year. The increased receipts have not been confined to any section of the country, but are universal, betokening general prosperity in every department of business. The rise in railroad stocks has added a vast amount to the available property of the country, and is beginning to be felt in the increased abundance of money and the appetite it is creating for new schemes. The improvement is very favorable to new projects, as it enables them to negotiate their securities at favorable rates. On the whole, there has never been a period when the prospects of railroads were more flattering, and their rapid prospective growth more certain. Those now in operation are beginning to repay the cost of construction, and what is of still more importance, by opening a market for our productions, they afford us means which would have, but for the facilities of transportation they furnish, been entirely unavailable; means that enable us to go on with new works without pressure and embarrassment, which their first construction occasions.

Maryland.

Chesapeake and Ohio Canal.—This work, of the commencement of which, "the memory of man runneth not to the contrary," is completed, and is now being navigated for its whole extent. The event of its opening was celebrated at Cumberland on the 10th instant with appropriate ceremonies.

The Cumberland Civilian notices among the gentlemen present: Gen. James M. Coale, President, and Messrs. John Pickell, W. Cost Johnson, Wm. A. Bradley, George Schley, S. P. Smith, directors of the Canal Company; Ex-Governor Sprigg, Gen. Tench Tilgman, and J. Van Lear, Esq., State Agents; the Hon. Wm. D. Merrick, late U. S. Senator from Maryland; John S. Skinner, Esq., Editor of "The Plough, the Loom and the Anvil," Henry Addison, Esq., Mayor of Georgetown; together with a number of gentlemen

from various parts of Maryland and Virginia.—Speeches were made, good things eaten, and the whole wound up with a grand dance. So much for the celebration.

The opening of this work is an important event for this State, from the aid its revenues will afford towards the payment of her State debt. The facilities it will afford to transportation will add largely to the export of the celebrated Cumberland Coal, and cheapen to the consumer the price of this important article. As the canal will be but little obstructed by ice at any period of the year, its opening at the present time is important to supply the deficit in the Pennsylvania coal, caused by the recent destructive freshet in that State.

Illinois.

Alton and Sangamon Railroad.—The following items of interest, in relation to this road, are extracted from a circular just issued to the stockholders of the company:—"The contractors have commenced the graduation, and masonry in the city of Alton, at Brighton, at Coup's Creek, and at Carlinville, and are now employing a force of three hundred and fifty men and sixty horses, which is increasing daily, and which will, before the end of the present month, reach to a constant force of five hundred men, and one hundred horses; besides this contracts for the cross-ties are in rapid execution, and twenty thousand are expected to be delivered at Alton early in November; and contracts for all the engines, cars, and six thousand tons of iron, and two thousand tons of spikes, necessary for the whole road, have also been entered into." The work in this city is progressing very rapidly.

Vermont.

It is stated that twenty-six miles of the Vermont and Canada railway, reaching from Essex to St. Albans, were to be open on the 18th inst. Only nineteen miles remain to be finished, which will be completed as early as the 15th of November.

Connecticut.

Passumpsic Railroad.—The extension of this road was opened Oct. 7th to McIndoe's Falls, about 8 miles above Wells river, and the work of extension northward still goes on at a rapid rate.

Indiana.

The Junction Railroad has been organized, and the Engineer, H. C. Moore, Esq., has been directed to commence an immediate survey of the route, and prepare the line for lettings from Rushville to the State-line. About one-half the amount of stock required to grade and bridge the road and prepare it for the iron.

Ohio Central Railroad.

The recent decision fixing Wheeling, Virginia, as the western terminus of the Baltimore and Ohio railroad, has directed the attention of the people of that city towards the extension of the road westward; and a meeting was held there on the 17th instant, for the purpose of taking the steps preliminary to a vote of the city towards subscribing \$300,000 in aid of the project. The vote will no doubt be a favorable one, and will lead to the early commencement of that portion of the Ohio Central between Zanesville and Wheeling.

New Hampshire.

It is stated that the Concord railroad has leased the Manchester and Lawrence for a term of five years. The Concord road agrees to pay the Lawrence, upon its capital, two per cent less than it divides upon its own.

New York.

Albion and Hornellsville Railroad.—The line of this road has been surveyed, and is soon to be placed under contract. This will prove the most important tributary to the Erie that has yet been projected, connecting it, as it will, with Buffalo by a very direct line. The completion of the above road will add materially to the through travel over the New York and Erie. The following it is stated will be the comparative distances from Buffalo to New York on the completion of the above line, and the straightening of the Central line:

Central route via Albany and Hudson river railroad.....	472 miles.
Same when shortened.....	449 "
Route via Hornellsville and Erie roads.....	410 "

Michigan Southern R. R. Co. \$400,000 SEVEN PER CENT. MORTGAGE LOAN.

SEALED PROPOSALS for four hundred thousand dollars of the first and only mortgage bonds of the Michigan Southern Railroad Company, bearing seven per cent. interest, will be received until the 15th day of November next.

These bonds are issued under the provisions of a special act of the Legislature of Michigan, authorizing the Company to dispose of or sell their obligations either within or without that State, at such rates or prices as may be agreed upon, and if sold below par, to be as binding as if sold at par.

They are secured by a mortgage executed to Shepherd Knapp, Esq., of the city of New York in trust for the bondholders.

This mortgage covers the entire line of the company's road in Michigan, whether already built or hereafter to be constructed, and it provides that bonds to an amount not exceeding one million of dollars in all may be issued; of which amount not more than \$400,000 can be issued until after the road shall have been completed to Sturges' Prairie, a distance of 117 miles from Lake Erie, to which point it will be completed by the first day of January next.

The security offered for the bonds is therefore a mortgage lien, and substantially the only lien, upon a road which, when completed to the State line of Indiana, will have nearly 140 miles of main line, besides a branch of 10 miles, and which will have cost, including the original outlay by the State, and the relaying the present track, about \$2,500,000; of which \$1,500,000 will be represented by stock.

The portion of the road already in operation, about 70 miles, yields an income ample to protect the entire debt proposed to be created, and the length of completed line and consequent increase of revenue, is daily increasing, affording a security which will place the payment of the debt beyond all contingencies.

For August, 1850, the earnings were \$16,417 27. For September, \$20,490. These receipts were derived from the road in its present unfinished condition. Fifty miles of completed road will be added to it within three months, and will be extended to the St. Joseph's river, at the Indiana State line, early next Spring, thus doubling the length of the main line now in operation.

This road is a part of a continuous line of railroads from the city of New York to the Mississippi river, by way of the Erie railroad and the Lake Shore road, and is an important link in the chain.

Nearly the whole of this great line from New York to the Mississippi river is either completed or in the course of construction.

As the means for the construction of the road ready for the iron are provided for by stock subscribed and being paid in, by regular instalments, and the proceeds of the bonds are mainly required for the purchase of iron heavy H rail and equipments, it is believed that no railroad bonds before the public offer greater inducement for safe investment than those of this company.

The mortgage empowers the Trustees, in case of failure, to pay the principal or interest of the bonds, to take possession of the road and receive its earnings, or to sell it, on due notice, and apply the proceeds to the extinguishment of the debt.

The bonds are in sums of \$1,000 each, payable at the Mechanics' Bank, in the city of New York,

Nov. 1st, 1850, with interest at seven per cent. per annum, payable semi-annually in New York, on the 1st Nov. and 1st May. Interest warrants or coupons are attached to the bonds.

Four hundred thousand dollars of the bonds are now offered for sale.

Sealed proposals for any amount not less than \$1,000 will be received until the 15th of November next.

Proposals may be addressed to **WINSLOW, LANIER & CO.**, No. 52 Wall street, or to **E. C. LITCHFIELD**, Treasurer, No. 65 Wall street, endorsed "PROPOSALS FOR MICHIGAN SOUTHERN RAILROAD BONDS."

\$200,000 (half the amount now offered) will be disposed of absolutely and without reserve to the highest bidder. The company reserve the right to withdraw the remainder if the offers are not satisfactory.

All necessary information in relation to the bonds, together with maps, may be obtained by calling on **WINSLOW, LANIER & CO.** or **E. C. LITCHFIELD**, at either of which places copies of the bonds and mortgages can be had.

Copies of the bonds and mortgage may also be seen on application to **Shepherd Knapp, Esq.**, President of the Mechanics' Bank, or to **James Van Nostrand, Esq.**, President of the Merchants' Exchange Bank.

Parties whose bids are accepted will be required to pay 25 per cent. upon the amount awarded to them immediately upon being notified of the acceptance of their bids, and the remainder in equal amounts on the 1st and 15th of December next, but any party will be at liberty to pay in full at once. Interest will commence from the day of payment.

New York, October 3d, 1850.

GEORGE BLISS,
CHARLES BUTLER,
JOHN STRIKER,
JOHN B. JERVIS,
EDWIN C. LITCHFIELD,
Committee of Directors.

RAILROAD CAR MANUFACTORY

TRACY & FALES,
GROVE WORKS, HARTFORD, CONN.
Passage, Freight and all descriptions of
RAILROAD CARS,

AS WELL AS
LOCOMOTIVE TENDERS,

Made to order promptly.

The above is the Largest Car Factory in the Union. In quality of Material, and in Workmanship, Beauty and Good Taste, as well as Strength and Durability, we are determined our work shall be unsurpassed.

JOHN R. TRACY. THOS. J. FALES.

United States Railroad Guide and Steamboat Journal.

CONTAINING OFFICIAL TIME ADVERTISEMENTS,
Tables of Stations, Distances, Fares, Time, etc., with much miscellaneous matter for the travelling public. Price 12 cents a copy. Yearly subscription \$1. Published at 43 Ann street, New York.



EMERSON'S
PATENT
CORRESPONDING
VENTILATORS,

For Ships, Steamers, etc.,

Manufactured by



CHILSON, ALLEN, WALKER & CO.,
351 Broadway, New York.

To Civil Engineers.

WANTED—A Practical Engineer, to be concerned in an Enterprise (a valuable Cannel Coal Mine) that will prove of great advantage to him, as well as those to be associated with him. A preference will be given to one possessing some means, to aid in the completion of the works now in progress, and to take an interest in the stock of the company, already incorporated. Communications addressed to **B. G. L.** at this office, with real name and address, will meet with immediate attention.

October 3, 1850.

4140

NOTICE

For Proposals for Railroad Iron, for the Alabama and Tennessee River Railroad,

TO BE MANUFACTURED FROM ALABAMA ORE.

THE Alabama and Tennessee River Railroad Co. invite proposals, until the 1st of January, 1851, for Iron Rails, to be made of Alabama Iron, for the Northern Division and part of the Southern Division of their road, embracing a distance of about 105 miles. The rails are to be of the H pattern, in lengths of 18 feet, and weighing 63 lbs. per lineal yard. They are to be delivered on the Coosa river, at a landing to be hereafter designated, between Kimulgee ferry and Fort Williams, commencing their delivery on the 1st of November, 1851, and continuing it at the rate of from 80 to 100 tons per week, until the whole quantity required (10,500 tons) shall have been delivered. They are to be inspected by Lewis Troost, Chief Engineer.

It is proper to state to iron masters and capitalists at a distance, that the country traversed by the Northern and part of the Southern divisions of the road abounds in excellent iron ore and bituminous coal, and possesses every advantage for the successful manufacture of iron, health, cheap labor and provisions.

Further information may be obtained by addressing the President of the Company at Selma, Ala. By order of the Board of Directors.

J. W. LAPSLEY, President.

STATE OF NEW YORK.

SECRETARY'S OFFICE, ALBANY, AUGUST 15, 1850.—To the Sheriff of the City and County of New York:—Sit, Notice is hereby given that at the General Election to be held in this State on the Tuesday succeeding the first Monday of November next, the following officers are to be elected, to wit:—A Governor in the place of Hamilton Fish; a Lieutenant Governor in place of George W. Patterson; a Canal Commissioner in place of Jacob Hinds; an Inspector of State Prisons in place of David D. Spencer; a Clerk of the Court of Appeals in place of Charles S. Benton; a Representative in the 32 Congress of the United States, for the 3d, 4th, 5th and 6th Districts, in place of J. Phillips Peenix, Walter Underhill, George Briggs and James Brooks. County Officers to be elected for said county: sixteen Members of Assembly; a District Attorney in place of John McKeon. All of whose terms of office will expire on the last day of December next. And also a City Judge, in pursuance of charter 206, laws of 1850. [The electors throughout the State are also to vote for or against the repeal of the act entitled "An act establishing Free Schools throughout the State," passed March 26, 1849, and an act entitled "An act to amend the act entitled an act establishing Free Schools throughout the State, passed April 11, 1849.]

Yours respectfully,
CHRISTOPHER MORGAN,
Secretary of State.

Sheriff's Office, Aug. 20, 1850.

I hereby certify that that the above is a correct copy of the notice of the General Election to be held on Tuesday succeeding the first Monday of November next, received this day from the Hon. Christopher Morgan, Secretary of State.

THOMAS CARNLEY,

Sheriff of the City and County of N. York.

N. B. All the public newspapers within this county will please publish this notice once in each week until the election. and send in their bills for advertising the same as soon as the election is over, so that they may be laid before the Board of Supervisors and passed for payment.

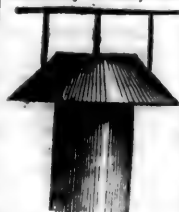
NOTICE.

A MEETING of the Stockholders of the Tonawanda Railroad Company, will be held at the Railroad Hotel, in the village of Attica, in the county of Wyoming, on the 18th day of November next, at 12 o'clock, at noon, for the purpose of passing upon the ratification of an agreement for the consolidation of the Tonawanda Railroad Company and the Attica and Buffalo Railroad Company, into a single corporation, made by the directors of the said two corporations, and to be submitted to said meeting. Dated October 8, 1850.

F. WHITTLESEY, Sec'y.

Emerson's Patent Ventilator,

ADAPTED to Cars, Engine houses, Public Halls, Factories, Churches, School Houses, Dwellings, Chimney Flues, etc.



This Ventilator is stationary, and cannot get out of order. It is constructed in such conformity to certain ascertained laws of pneumatics, as to insure a constant draft outward, whatever may be the changing direction of the wind. The Massachusetts Mechanic Association have awarded a gold medal to the Inventor, and the Manufacturers have already disposed of over 3,000 of the article. Manufactured and sold by CHILSON, ALLEN, WALKER & Co., 351 Broadway, New York.

Railroad Iron.

THE Undersigned are prepared to contract for the delivery of superior make Welsh Railroad Iron of the favorite brand "Aberdare."

JOSEPH BRAMWELL & Co.,
40 91 Wall street.

American Cast Steel.

THE ADIRONDAC STEEL MANUFACTURING CO. is now producing, from American iron, at their works at Jersey City, N.J., Cast Steel of extraordinary quality, and is prepared to supply orders for the same at prices below that of the imported article of like quality. Consumers will find it to their interest to give this a trial. Orders for all sizes of hammered cast steel, directed as above, will meet with prompt attention.

May 28, 1849.

R. R. Instruments for Sale.

A Theodolite & Spirit level by Troughton & Simms. Also Architectural and Engineering Works, together with Drawing Instruments, Plotting Scales, Paper, etc., may be had a bargain, the owner having no further use for them. Apply by letter or personally to R. S. B, 23 Mercer st. 1m*42

To Railroad Companies, Machinists, Car Manufacturers, etc., etc.

CHARLES T. GILBERT,
NO. 80 BROAD ST., NEW YORK,

IS prepared to contract for furnishing at manufacturer's prices—

Railroad iron,
Locomotive Engines,
Passenger and Freight Cars,
Car Wheels and Axles,
Chairs and Spikes.

Orders are invited; and all inquiries in relation to any of the above articles will receive immediate attention.

American Railway Guide, AND POCKET COMPANION FOR THE UNITED STATES;

CONTAINING Correct Tables, showing the time for starting of trains from all stations, distances, fares, etc., on all the Railway lines in the U. States; also many of the principal Steamboat and Stage routes—accompanied by a complete RAILWAY MAP. Price, single copies 12½ cts., or \$1 per annum. Published on the first of every month, corrected from returns furnished by the Railway Superintendents throughout the Union.

This book has been compiled somewhat on the plan of Bradshaw's Guide, with such improvements in size, form and arrangement as have seemed desirable; and the publisher confidently hopes it will not be found liable to the objections of incompleteness and incorrectness, which have been made, and justly too, against various other similar works heretofore issued.

The subscriber having had the management of the NEW YORK PATHFINDER almost from its commencement, has enjoyed superior facilities in obtaining information relating to the thoroughfares of travel, and is therefore well qualified to prosecute with success the arduous undertaking of furnishing a complete and correct national guide book.

STRINGER & TOWNSEND, General Agents, 222 Broadway: and sold also by Booksellers and Periodical Dealers generally throughout the country; also on all the Railways and Steamboats.

CURRAN DINSMORE, Publisher.

N. Y. Pathfinder Office,
125 Fulton St., New York City.

Notice to Contractors.

CENTRAL OHIO RAILROAD.

SEALED PROPOSALS for the Graduation and Masonry of 36 miles of the Central Ohio Railroad, extending from the 24th section—three miles east of Newark to the City of Columbus—will be received until the 1st day of November next.

Also for the Bridging (being about 1200 lineal ft.) for the whole line from Zanesville to Columbus.

Also, for 55,000 White Oak Cross Ties, deliverable along the line from Zanesville to Newark before the first day of May, 1851.

Also, for 72,000 White Oak Cross Ties, deliverable along the line from Newark to Columbus before the 1st of August, 1851.

Contractors proposing for the construction of Bridges may propose for plans furnished by themselves, as well as those furnished by the Engineer.

The line will be ready for examination by the 10th of next month (October.)

The bids will be received at the office of the Engineer in Newark, where plans will be exhibited, and specifications furnished.

Contractors unknown to the undersigned must produce satisfactory testimonials.

The amount of work involved in this letting is well worthy the attention of enterprising contractors. By order of the Board.

ROBERT MAC LEOD Chief Engineer.

Zanesville, Sept. 24, 1850.

P.S. A large number of laborers would find immediate employment and fair wages upon the portion of the line now under contract.

To Contractors.

ALABAMA AND TENNESSEE RIVER R. R. SEALED Proposals will be received by the Directors of the Alabama and Tennessee River Railroad, at their office in Selma, until the 1st of November next, for the graduation, masonry and bridging of 56 miles of the Southern Division of said road, extending northwardly from Selma.

Plans and profiles may be inspected and specifications and information will be given at the office of the company in Selma, on and after the 15th of October next.

Twenty-six miles of this division were graded in 1839. This part of the division will require repairs to the road bed, and will be furnished anew with culverts and bridges.

The country embraced in this division is healthy, well watered, and possesses facilities for obtaining supplies of provisions.

Proposals may be based upon cash payments, or upon payments of a proportion, or of the whole of the work in stock.

The Directors reserve to themselves the right to accept or reject proposals as they may think proper for the interests of the company.

The Directors expect to have as much as twenty miles of the Northern Division, extending northwardly from the Coosa river in Shelby county, ready for examination by the 15th November, and for letting by the 1st December; and 30 miles more, ready for examination by the 1st and for letting by the 15th of January, 1851. It is likewise their intention to let out the grading, masonry and bridging of the remainder of the Southern Division and of the Northern Division terminating at Gadsden, with all possible despatch.

By order of the President and Directors.

LEWIS TROOST, Chief Engineer
Selma, Ala., August 30, 1850.

FOR SALE.

THREE LOCOMOTIVES, Manufactured by M. W. Baldwin, of 10 tons weight, all in complete repair, and now running on the Columbia and Philadelphia Railroad.

For particulars apply to A. L. Roumfort, Supt. of said road, either at Philadelphia, or Parkersburg, Chester county.

A. L. ROUMFORT,
Supt. Motive Power Col. & Philad. R.R.

Bowling Tire Bars.

40 Best Flange Bars 5½x2 inches, 11 feet long.
40 " " 5½x2 " " 7 feet 8 in. long.
40 " Flat " 6x2 " " 11 feet long.
40 " " 6x2 " " 7 feet 8 in. long.

Now in store and for sale by
RAYMOND & FULLERTON,
46 Cliff street.

Great American Engineering
AND MECHANICAL WORK, just published in medium folio One Dollar, 75 cts. to Subscribers. Part VIII of "Specimens of the Stone, Iron & Wood Bridges, Viaducts, Tunnels, Culverts, &c., &c., of the United States Railroads." By George Duggan, Architect and Civil Engineer.

The present part contains beautifully executed plans, elevations, sections and isometrical views of the fine Timber Bridge, two arches, 150 feet span, across the Patapsco River, on the line of the Baltimore and Ohio R.R. Also Plans, Elevations and Sections of the Viaduct under the Erie Canal at Lodi, and Culverts of 4 feet chord on the line of the Utica and Syracuse R.R., with the Specifications, Estimates, form of Contract, etc., for the Hartford and N. Haven R.R. Extension.

Published by **GEORGE DUGGAN**,
300 Broadway, New York.
To whom all communications should be addressed, and subscriptions forwarded.

Providence Tool Co.,

MANUFACTURERS OF
Plane Irons, Tooth Irons, Soft Moulding and Rabbit Irons, Cornice Irons, Plow Bits, and Planing Machine Knives:
NUTS, WASHERS AND BOLTS.

—ALSO—
PLATE HINGES AND PICK AXES.
They are prepared to execute orders for all descriptions of Cold Punching and Job Work.
WM. FIELD, Agent. RUFUS WATERMAN, Treas.
PROVIDENCE, R. I.

Ibbotson, Brothers & Co's CELEBRATED CAST STEEL

AND
Best Cast Steel Royal Improved Files, well known as better adapted for Engineers' and Machinists' purposes than any now in use in the United States.

Every description of Square, Octagon, Flat and Round Cast Steel, Sheet, Shovel and Railway Spring Steel, etc., and Steel to order for any purposes—manufactured at their works in Sheffield—and universally known by the old stamp "Globe."

HENRY I. IBBOTSON, Agent,
218 Pearl st., New York.

Railroad Iron.

OF ANY PATTERN AND WEIGHT,
Of a Favorite Brand,
And deliverable in Bond, or Duty paid, at any Port of the U. S., contracted for on favorable terms, by

CHARLES ILLIUS,
20 Beaver St., New York.
Pig and other Iron also contracted for. Sole Agent for "Baxter's Machine and Burning Oil"—particularly adapted for "Railroads" and other Machinery—Preferred to Sperrin by the many now using it, and 25 per cent. cheaper.

Faggotted Car and Engine Axles

FORGED by RANSTEAD, DEARBORN & Co.,
Boston, Mass.
These Axles enjoy the highest reputation for excellence, and are all warranted.

GRAHAM'S COMPOSITION, to Remove and Prevent Incrustation (or Scale) in STEAM BOILERS.

THIS valuable composition having been fully and extensively tested, is now offered to the public, as a sure remedy and preventive for incrustations in steam boilers of all descriptions. By its use, all scale is entirely removed from the boilers of Ocean and River Steamers, Locomotive and Stationary Engines, in from 3 to 20 running days, according to the size of the boiler and thickness of the scale. In New Boilers, all incrustation is prevented at a trifling expense.

The preservation of the boiler, great economy of fuel and labor, safety, and increased speed, are among the advantages to be derived from the use of this composition.

Orders should state the quality of water used, viz: "Salt," "Fresh," or "Brackish."

For sale, with directions for use, by

W. H. NEWMAN,
75 Pearl street,
New York.

TESTIMONIALS.

New York, August 17, 1850.

We have used Graham's Composition in the boilers of the Steamship Southerner, during several voyages between this place and Charleston. The boilers were old and very foul with scale, a very large quantity of which was removed by the use of the composition, and no new scale was formed.

From our own experience and observation in the use of the article, we are fully satisfied that it will effectually remove the incrustation made by sea water, and also that it will effectually prevent its formation.

We are also satisfied that the use of it will be attended with a great saving of fuel, and that it has no injurious effect upon iron.

DAVID N. MAXON, Engineer,
BERRY, Master,
Steamship Southerner.

Steamship Philadelphia, }

New York, August 27, 1850.

I have used "Graham's Composition for Steam Boilers," in the boilers of Steamship Philadelphia, on the voyage to and from Chagres, and am entirely satisfied that it will remove, dissolve and prevent all scale or incrustation in salt water boilers.

For the preservation of the boiler and economy of fuel and labor, I hereby recommend the employment of this composition in the Boilers of Ocean Steamers.

WM. BISBY,
Chief Engineer.

Novelty Iron Works, }

New York, July 5, 1850.

We have examined the specimen of Graham's Composition for preventing incrustation of steam boilers, and we believe it may be used with perfect safety in reasonable quantities for the purpose intended, as there does not appear to be any agent in the composition calculated to injure the iron.

STILLMAN, ALLEN & CO.

Piermont, May 20, 1850.

I have used "Graham's Composition," and find it to produce the intended effect; and I hereby, without hesitation, recommend it for Stationary, Marine and Locomotive Engine Boilers.

JOHN BRANDT,
Superintendent Motive Power
New York & Erie R.R.

New York, July 25, 1850.

In answer to many inquiries as to the practical effect of "Graham's Composition," I will state that I have used it in the boiler of the Steamboat Sunwick, which had become considerably incrustated with hard scale from both salt and fresh water. We used 10 lbs. per day, for three days, without blowing off the water, until the fifth day, when all was drawn off. To our astonishment, we found the whole interior of the boiler as clear of scale and smooth as when it came from the hands of the maker. The following week, we tried the same quantity in a small steam tow boat.—The boiler had old scale of long accumulation and very thick.—We ran the boat three days without blowing off, and on the fourth day washed out the boiler and found it, like the "Sunwick's," perfectly clean and smooth as when new. I am therefore enabled to state that the use of the composition in these two instances under my own immediate observation and direction, has been attended with complete success.

JAMES MORROW,
Engineer Astoria Ferry.



To Merchants, Railroad Companies, Machinists and Boiler Makers.

THE subscribers beg leave to call attention to their very large stock of Iron and Steel—of American, English, Swede and Norway make—of all the different kinds in use. Also, Railroad Iron, Ship, Boat and Railroad Spikes. They are also Agents for the Best Pennsylvania Locomotive Boiler and Tank Iron, each sheet of which will be stamped and warranted, at lowest mill prices. Our prices for all kinds of iron will be found very low, either for cash or approved credit.

BRINK & DURBIN, Philadelphia.

ENGINEERS.**Atkinson, T. C.,**

Alexandria and Orange Railroad, Alexandria, Va.

Bancks, C. W.,

Civil Engineer, Vicksburg, Miss.

Buckland, George,

Troy and Greenbush Railroad.

Clement, Wm. H.,

Little Miami Railroad, Cincinnati, Ohio.

Cozzens, W. H.,

Engineer and Surveyor, St. Louis, Mo.

Alfred W. Craven,

Chief Engineer Croton Aqueduct, New York.

Davidson, M. O.,

Eckhart Mines, Alleghany Co., Maryland.

Fisk, Charles B.,

Cumberland and Ohio Canal, Washington, D. C.

Felton, S. M.,

Fitchburgh Railroad, Boston, Mass.

Floyd-Jones, Charles,

South Oyster Bay, L. I.

Gzowski, Mr.,

St. Lawrence & Atlantic Railroad, Montreal, Canada.

Gilbert, Wm. B.,

Rutland and Burlington Railroad, Rutland, Vt.

Grant, James H.,

Nashville and Chattanooga R. R., Nashville, Tenn.

S. W. Hill,

Mining Engineer and Surveyor, Eagle River, Lake Superior.

Hewson, M. Butt,

Memphis, Tenn.

Holcomb, F. P.

Southwestern Railroad, Macon, Ga.

Johnson, Edwin F.

New York and Boston Railroad, Middletown Ct.

Latrobe, B. H.,

Baltimore and Ohio Railroad, Baltimore, Md.

Miller, J. F.,

Worcester and Nashua Railroad, Worcester, Mass.

Morris, Elwood,

Schuylkill Navigation, Schuylkill Haven, Pa.

Morton, A. C.,

Atlantic and St. Lawrence Railroad, Portland, Me.

McRae, John,

South Carolina Railroad, Charleston, S. C.

Nott, Samuel,

Lawrence and Manchester Railroad, Boston.

Prichard, M. B.,

East Tennessee and Georgia R. R., Cleveland, Tenn.

Roebbing, John A.,

Trenton, N. J.

W. Milnor Roberts,

Bellefontaine and Indiana Railroad, Marion, Ohio.

Roberts, Solomon W.,

Ohio and Pennsylvania Railroad, Pittsburgh, Pa.

Sanford, C. O.,

South Side Railroad, Virginia.

Schlatter, Charles L.,

Northern Railroad (Ogdensburg), Malone, N. Y.

Sours, Peter,

Rahway, New Jersey.

Stark, George.,

Bost., Con. and Mont. R. R., Meredith Bridge, N. H.

Steele, J. Dutton,

Pottstown, Pa.

Trautwine, John C.,

Panama Railroad—Address through office of Panama Railroad Co., 78 Broadway, N. Y.

Trimble, Isaac R.,

Philad., Wil. & Baltimore Railroad, Wilmington, Del.

Tinkham, A. W.,

United States Fort, Bucksport, Me.

Thomson, J. Edgar.,

Pennsylvania (Central) Railroad, Philadelphia.

Troost, Lewis,

Alabama and Tennessee Railroad, Selma, Ala.

Whipple, S.,

Civil Engineer and Bridge Builder, Utica, N. Y.

Williams, E. P.,

Auburn and Schenectady Railroad, Auburn, N. Y.

Williams, Charles H.,

Milwaukee, Wisconsin.

HOTELS.**Exchange Hotel,**

Adjoining Eastern Railroad Depot,

BUFFALO, N. Y.

BY.....**FISK & SPERRY,**
Late of Delevan House, Albany.**J. D. Abraham, Architect,**

NO. 300 MAIN STREET,

BUFFALO, N. Y.

Fountain Hotel,

LIGHT STREET, BALTIMORE,

P. THURSTON.....Proprietor.

DUNLAP'S HOTEL,

On the European Plan,

NO. 135 FULTON STREET,

Between Broadway and Nassau St.,

NEW YORK.

MANSION,Corner of Maine and Exchange Streets,
P. DORSHIMER. BUFFALO.**GUY'S****United States Hotel,**

(Opposite Pratt street Railroad Depot,)

BALTIMORE.

JOHN GUY.

WILLIAM GUY.

American Hotel,

Pratt street, opposite the Railroad Depot,

BALTIMORE.

HENRY M. SMITH.....Proprietor.
Late of the Exchange & St. Charles Hotels, Pittsburg.**Washington Hotel,**

BY JOHN GILMAN,

\$1 Per Day.

No. 206 Pratt street, (near the Depot,)

BALTIMORE.

Barnum's City Hotel,

MONUMENT SQUARE, BALTIMORE.

This Extensive Establishment, erected expressly for a Hotel, with every regard to comfort and convenience, is situated in the centre and most fashionable part of the city, and but a few minutes' walk from the Railroad Depots and Steamboat Landings.

The House has lately undergone a thorough repair, embracing many valuable improvements, and will accommodate 250 Guests. BARNUM & CO.

JONES' HOTEL,

NO. 152 CHESTNUT STREET,

PHILADELPHIA.

Barnum & Warr, Proprietors.

BUSINESS CARDS.**Lithography.**

JOHN P. HALL & CO.,

161 Main st., Buffalo, (Commercial Advertiser Build.)

Are prepared to execute all kinds of Lithography in good style and at reasonable rates. Particular attention will be paid to Engraving Railroad Maps, Engineer's Plans and drafts, etc., and orders in this line are respectfully solicited.

J. T. Hodge

Will attend to the examination of mining tracts near Lake Superior, and prepare Reports and Maps.

Address, during the Summer,
Ontanagon Postoffice, Lake Superior.**Cumberland Steam Coal,**

FROM THE

FROSTBURG MINES, MD.

H. A. TUCKER,

Agent of Frostburg Coal Co.

No. 50 Wall Street, New York.

Eaton, Gilbert & Co.,Railroad Car, Coach and Omnibus Builders,
TROY, N. Y.**Charles T. Jackson, M. D.,**

STATE ASSAYER, late Geologist to Maine, Rhode Island, New Hampshire, and the United States, offers his services to his friends and the public in making any Chemical, Mineralogical or Geological researches that may be required for the improvement of Agriculture and the Manufacturing Arts. Particular attention will be paid to the exploration of mines and to assaying of ores of the metals.

State Assayer's office, 31 Somerset st.
Boston Sept. 3, 1850.**To Railroad Companies and Mechanical Establishments.**

A Person of considerable experience and practical knowledge in Mechanical, Civil and Marine Engineering, is anxious to meet with an engagement with either a Private Individual or Public Company, who may have works either to design or execute in the above branches of the Engineering Profession. Address Z. Y., 47 Atlantic st., South Brooklyn, L. I.

STEEL AND FILES.**R. S. Stenton,**

20 CLIFF STREET, NEW YORK,

AGENT FOR

J. & RILEY CARR,BAILEY-LANE WORKS, SHEFFIELD,
Manufacturers of Cast, Shear, German, Blisters, and**Spring Steel,**

Of all descriptions, Warranted Good.

FILES.

Manufacturers of Machinists' Warranted Best Cast Steel Files, expressly for working upon Iron and Steel, made very heavy for recutting.

A full Stock of Steel and Files at all times on hand. 6m4

Walter R. Johnson,

CIVIL AND MINING ENGINEER AND ATTORNEY for Patents. Office and Laboratory, F St., opposite the Patent office, Washington, D. C.

Dudley B. Fuller & Co.,

IRON COMMISSION MERCHANTS,

No. 139 GREENWICH STREET,

NEW YORK.

Manning & Lee,

GENERAL COMMISSION MERCHANTS,

NO. 51 EXCHANGE PLACE,

BALTIMORE.

Agents for Avalon Railroad Iron and Nail Works, Maryland Mining Company's Cumberland Coal 'CED'—'Potomac' and other good brands of Pig Iron.

Cop Waste.

CLEAN COP WASTE, suitable for cleaning Railroad, Steamboat and Stationary Engines, constantly on hand and for sale by

KENNEDY & GELSTON,
54 Pine St., New York.

October 27, 1849,

3m

PLUSHES

FOR

Railway Cars & Omnibuses.**F. S. & S. A. MARTINE,**

112 WILLIAM ST., NEAR JOHN.

ARE now receiving a large and complete assortment of Plain and Figured PLUSHES, of their own importation, which will be sold at the lowest market price, viz: Crimson, Maroon, Scarlet, Green, Blue, Purple, etc.

ALSO—CURLED HAIR, the best manufactured in market.

Samuel Kimber & Co.,
COMMISSION MERCHANTS

WILLOW ST. WHARVES, PHILADELPHIA.

AGENTS for the sale of Charcoal and Anthracite Pig Iron, Hammered Railroad Car and Locomotive Axles, Force Pumps of the most approved construction for Railroad Water Stations and Hydraulic Rams, etc., etc.

July, 27, 1849.

James Herron, Civil Engineer,OF THE UNITED STATES NAVY YARD,
PENSACOLA, FLORIDA.

PATENTEE OF THE

HERRON RAILWAY TRACK.

Models of this Track, on the most improved plans, may be seen at the Engineer's office of the New York and Erie Railroad.

To Railroad Companies.**—WROUGHT IRON WHEELS—**

SAFETY AND ECONOMY.

NORRIS' LOCOMOTIVE WORKS,
SCHENECTADY, NEW YORK,

Are Manufacturing Wrought Iron Driving, Truck, Tender, and Car Wheels—made from the best American Iron. Address **E. S. NORRIS.**
May 16, 1849.

Manufacture of Patent Wire
ROPE AND CABLES,

For Inclined Planes, Suspension Bridges, Standing Rigging, Mines, Cranes, Derrick, Tilters, &c., by **JOHN A. ROEBLING, Civil Engineer,**
TRENTON, N. J.

Doremus & Harris,ANALYTICAL & CONSULTING CHEMISTS,
179 BROADWAY, NEW YORK.

SCHOOL OF CHEMISTRY.

To Engineers and Surveyors.

E. BROWN AND SON Mathematical inst. makers No. 27 Fulton Slip, New York, make and keep for sale, Theodolites, Levelling inst., Levelling rods, Surveyors Compasses, and Chains, Cases of Mathematical drawing insts. various qualities, together with a general assortment of Ivory Scales and small insts. generally used by Engineers.

FORGING.**Ranstead, Dearborn & Co.,**

MANUFACTURERS OF

LOCOMOTIVE CRANKS AND CAR AXLES,

ALSO

WROUGHT IRON SHAFTING,

And All Kinds of Hammered Shapes.

Office 25 Foster's Wharf, Boston.

Henry I. Ibbotson,

IMPORTER of Sheffield and Birmingham Goods.
Also, Agent for the Manufacture of Telegraph Wire.
218 PEARL ST., NEW YORK.

Cumberland, (Md.) Coals for
Steaming, etc.

ORDERS RECEIVED FOR AND FILLED
by **J. COWLES, 27 Wall St., N. Y.**

Samuel D. Willmott,

MERCHANT, AND MANUFACTURER OF
CAST STEEL WARRANTED SAWS,
—AND FILES—

IMPORTER OF THE

GENUINE WICKESLY GRINDSTONES
 NO. 8 LIBERTY STREET,
 NEW YORK.

Railroad Instruments.

THEODOLITES, TRANSIT COMPASSES,
 and Levels, with Fraunhoffer's Munich Glasses,
 Surveyor's Compasses, Chains, Drawing Instruments,
 Barometers, etc., all of the best quality and
 workmanship, for sale at unusually low prices, by
E. & G. W. BLUNT,
 No. 179 Water St., cor. Burling Slip.
 New York, May 19, 1849.

IRON.**Car Wheel Iron.**

100 Tons "Columbia" No. 2 Cold Blast Charcoal
 Iron.
 300 Tons "Salisbury" No. 1, do. do.

For sale by **CHARLES T. GILBERT,**

No. 80 Broad st.

New York, Sept. 21, 1850.

Railroad Spikes.

THE subscribers are prepared to make and execute
 contracts for Railroad Spikes of a superior quality,
 manufactured by the New Jersey Iron Company,
 at Boonton. **DUDLEY B. FULLER & CO.**
 139 Greenwich st. corner of Cedar.

Railroad Iron.

FOR SALE—500 Tons of superior flat bar Railroad
 Iron, two and a half three-fourths—which has
 been in use on the Cumberland Valley Railroad for
 about three years. For terms apply to **Henry J. Bid-
 die, Esq., Philadelphia,** or to **FREDK. WATTS,**
 President of the Cum. Val. R. R., Carlisle, Pa.
 Carlisle, Sept. 17, 1850.

Railroad Iron.

1650 Tons, weighing about 61 lbs. per yard, 40
 tons, weighing about 52 lbs. per yard, and
 825 tons, weighing about 53½ lbs. per yard, of the lat-
 est and most approved patterns of T rail, for sale by
BOORMAN, JOHNSTON & CO.,
 119 Greenwich street.

New York, Aug. 26, 1850.

N.B.—B. J. & Co are also prepared to take con-
 tracts for English rails, delivered in any of the Atlan-
 tic ports of the United States.

Railroad Iron.

THE Undersigned, Agents for Manufacturers, are
 prepared to contract to deliver Rails of superior
 quality, and of any size or pattern, to any ports of dis-
 charge in the United States.

COLLINS, VOSE & CO.

74 South St.

New York, June 1, 1850.

Railroad Iron.

1,500 Tons weighing 53 lbs. per lineal yard.

500 " " 57 " "

500 " " 56 " "

500 " " 60 & 61 lbs. "

Also 2½ flat rails. All the above being of approv-
 ed patterns. For sale by

DAVIS, BROOKS & CO.,

68 Broad street.

N.B.—Rails imported on commission, or at a fixed
 price.

Iron.

Pig Iron, Anthracite and Charcoal; Boiler and Flue
 Iron, Spring and Blistered Steel, Nail Rods, Best Re-
 fined Bar Iron, Railroad Iron, Car Axles, Nails, Stove
 Castings, Cast Iron Pipes of all sizes, Railway Chairs
 of approved patterns for sale by

COLEMAN, KELTON & CAMPBELL,

109 N. Water St., Philadelphia.

Railroad Iron.

THE UNDERSIGNED, HAVING made arrange-
 ments abroad, are prepared to contract for the de-
 livery of Foreign rails, of approved brands upon the
 most favorable terms.

They will also make contracts for American rails,
 made at their Trenton works, from Andover Iron, in
 whole or in part, as may be agreed upon.

They are prepared to furnish Telegraph, Spring and
 Market Wire; Braziers and Wire Rods; Rivets and
 Merchant Bars to order, all made exclusively from An-
 dover Iron. The attention of parties who require Iron
 of the very best quality for special purposes, is respect-
 fully invited.

COOPER & HEWITT,

17 Burling Slip, New York.

February 15, 1850.

Glendon Refined Iron.

Round Iron, Band Iron, Hoop Iron,
 Square " Flat " Scroll "

Axles, Locomotive Tyres,

Manufactured at the Glendon Mills, East Boston, for
 sale by **GEORGE GARDNER & CO.,**
 5 Liberty Square, Boston, Mass.

Sept. 15, 1849.

3m37

**PATENT HAMMERED RAILROAD, SHIP &
 BOAT SPIKES.**—The Albany Iron Works
 have always on hand, of their own manufacture, a
 large assortment of Railroad, Ship and Boat Spikes
 from 2 to 12 inches in length, and of any form of head
 From the excellence of the material always used in
 their manufacture, and their very general use for rail-
 roads and other purposes in this country, the manu-
 facturers have no hesitation in warranting them fully
 equal to the best spikes in market, both as to quality
 and appearance. All orders addressed to the subscrib-
 ers at the works will be promptly executed.

JOHN F. WINSLOW, Agent.

Albany Iron and Nail Works, Troy, N. Y.
 The above Spikes may be had at factory prices, of
Erastus Corning & Co Albany; Merrill & Co., New
York; E. Pratt & Brother, Baltimore Md

LAP—WELDED
WROUGHT IRON TUBES

FOR

TUBULAR BOILERS,

FROM ONE AND A QUARTER TO SEVEN
 INCHES IN DIAMETER.

THE ONLY Tubes of the same quality and man-
 ufacture as those so extensively used in England,
 Scotland, France and Germany, for Locomotive, Ma-
 rine and other Steam Engine Boilers.

THOMAS PROSSER & SON, Patentees,
 28 Platt street, New York.

Railroad Iron.

THE UNDERSIGNED ARE PREPARED TO
 contract for the delivery of English Railroad Iron
 of favorite brands, during the Spring. They also re-
 ceive orders for the importation of Pig, Bar, Sheet, etc.
 Iron.

THOMAS B. SANDS & CO.,

73 New street,

February 3, 1849.

New York.

Iron Store.

THE Subscribers, having the selling agency of the
 following named Rolling Mills, viz: Norristown,
 Rough and Ready, Kensington, Triadelphia, Potts-
 grove and Thorndale, can supply Railroad Companies,
 Merchants and others, at the wholesale mill prices for
 bars of all sizes, sheets cut to order as large as 58 in.
 diameter; Railroad Iron, domestic and foreign; Loco-
 motive tire welded to given size; Chairs and Spikes;
 Iron for shafting, locomotive and general machinery
 purposes; Cast, Shear, Blister and Spring Steel; Boil-
 er rivets; Copper; Pig Iron, etc., etc.

MORRIS, JONES & CO.,

Iron Merchants,

Schuylkill 7th and Market Sts., Philadelphia.
 August 16, 1849. ly33

Railroad Iron.

THE MOUNT SAVAGE IRON WORKS, AL-
 leghany county, Maryland, having recently pass-
 ed into the hands of new proprietors, are now prepar-
 ed, with increased facilities, to execute orders for any
 of the various patterns of Railroad Iron. Communi-
 cations addressed to either of the subscribers will have
 prompt attention. **J. F. WINSLOW, President**
 Troy, N. Y.

ERASTUS CORNING, Albany**WARREN DELANO, Jr., N. Y.****JOHN M. FORBES, Boston.****ENOCH PRATT, Baltimore, Md**

November 6, 1848.

Railroad Iron.

THE SUBSCRIBERS ARE PREPARED TO
 take orders for Railroad Iron to be made at their
 Phoenix Iron Works, situated on the Schuylkill Riv-
 er, near this city, and at their Safe Harbor Iron Works,
 situated in Lancaster County, on the Susquehanna
 river; which two establishments are now turning out
 upwards of 1800 tons of finished rails per month.

Companies desirous of contracting will be promptly
 supplied with rails of any required pattern, and of the
 very best quality.

REEVES, BUCK & CO.

45 North Water St. Philadelphia,

March 15, 1849.

Tredegar Iron Works.

ROLLING MILL FOUNDRY AND MACHINE SHOPS. The undersigned continues to manufacture at his Works in this city (from best charcoal metal) Bar Iron of every description, embracing—Rounds and Squares, from 1½ to 5 inches diameter. Flats, from ½ to 7 inches, all thicknesses. Bands and Scrolls, all sizes. Boiler plate and Plough Iron. Railroad and Locomotive Axles and Tires. Locomotive Frames, Spikes and Plates. Hoops, Ovals, Half Ovals, Half Rounds, Angle, T, L, and indeed every description of Iron usually manufactured, all of which he warrants to be equal to any made in this country. He also manufactures at his Foundry and Machine Shops all descriptions of Railroad Work, say, Locomotives, Railroad Wheels and Axles complete and ready for the road, Railroad Chairs, etc. Also, Marine and Stationary Engines all sizes, Sugar mills and Engines, Horse mills, and every kind of Machinery usually required for the operations of the country. He has paid particular attention to getting up machinery, etc., for Gold Mine operations, and those in want of such work might find it to their advantage to give him a call.

J. R. ANDERSON.
Richmond, Va., Sept. 10, 1850.

CUT NAILS OF BEST QUALITY, BAR IRON (including Flat Rails) manufactured and for sale by
FISHER, MORGAN & CO.,
75 N. Water St., Philadelphia.

Iron Wire.

REFINED IRON WIRE OF ALL KINDS, Card, Reed, Cotton-flyer, Annealed, Broom, Buckle, and Spring Wire. Also all kinds of Round, Flat or Oval Wire, best adapted to various machine purposes, annealed and tempered, straightened and cut any length, manufactured and sold by
ICHABOD WASHBURN.
Worcester, Mass., May 25, 1849.

Wheel, Forge and Foundry Iron.

LOCUST GROVE Wheel Iron of great strength and superior chilling property.
Balt. Charcoal Forge Iron, from Patuxent, Curtis Creek and Gunpowder furnaces.
Elkridge Foundry Iron, of superior strength and softness. Anthracite and Charcoal Iron from Pennsylvania and Virginia. Gas and Water Pipes, Lamp Posts from Elkridge furnace.

LEMMON & GLENN,
62 Buchanan's Wharf, Baltimore.

S. S. Keyser & Co., IRON WAREHOUSE,

Corner of South and Pratt Streets, BALTIMORE, MD.
Selling Agents for the Rough and Ready Bar Iron and Elk Boiler and Flue Iron Rolling Mills, Sarah and Taylor Furnaces, and Wrightsville Hollow Ware Foundry, and Dealers in Bar and Sheet Iron, and Cast, Sheer, German, Blister, Spring and Electroplated Steel, etc., etc.

Smith & Tyson,

GENERAL COMMISSION MERCHANTS,
No. 25 South Charles St., Baltimore, Md.

AGENTS for the Celebrated Columbia Pig Iron, suitable for Car Wheels and Chilled Rails.
Columbia refined Charcoal Blooms; Refined Charcoal Juniata Billet Iron for Wire; Refined Iron for Bridging, of great strength; Cut Nails, Spikes, and Brads; Railroad Spikes and Wrought Chairs. 22tf

Stickney & Beatty,

DEALERS IN IRON AND IRON MANUFACTURERS.

AGENTS for the Balt. City Rolling Mill, from which establishment they are prepared to furnish Ellicott's round, square, and flat bar iron, puddled and charcoal boiler plates and billet iron—also agents for the sale of the Laurel and Maryland (Balt.) charcoal forge pig irons, Balt. hard iron for chilling wheels, anti-rust nails, Catocin foundry iron, boiler blooms from the Caledonian works, Wm. Jessop & Son's cast steel, Coleman's blister steel and nail rods, hoop, band, sheet, oval and common English iron.

Nos. 18 and 20 South Charles st., Baltimore.

Railroad Iron.

CONTRACTS made by the subscribers, agents for the manufacturers, for the delivery of Railroad Iron, at any port in the United States, at fixed prices, and of quality tried and approved for many years, on the oldest railways in this country.

RAYMOND & FULLERTON, 45 Cliff St.

IRONDALE PIG METAL, MANUFACTURED and for sale by the Bloomsburg Railroad Iron Co.
LINDLEY FISHER, Treasurer.
75 N. Water St., Philadelphia.

Railroad Iron.

2000 Tons, weighing 58 pounds per lineal yard, of the most approved pattern of T rails, in store and to arrive, for sale by
COLLINS, VOSE & CO.,
74 South St.

New York, June 1, 1850.

Railroad Iron.

3,000 TONS C. L. MAKE 63½ lbs. per yard, now landing and to arrive.
Also contracts made for future delivery of above superior make English Iron.
300 Tons Banks Best Iron, Round, Square and Flat.
200 " English Bar " " " " "
10 " 9-16 Square Iron for Railroad Spikes.
For sale in lots to suit purchasers by
DAVID W. WETMORE.
New York, March 26, 1850. 3m

WILLIAM JESSOP & SONS' CELEBRATED CAST-STEEL.

The subscribers have on hand, and are constantly receiving from their manufactory,

PARK WORKS, SHEFFIELD,

Double Refined Cast Steel—square, flat and octagon.
Best warranted Cast Steel—square, flat and octagon.
Best double and single Shear Steel—warranted.
Machinery Steel—round.

Best and 2d gy. Sheet Steel—for saws and other purposes.

German Steel—flat and square, "W. I. & S." "Eagle" and "Goat" stamps.

Genuine "Sykes," L. Blister Steel.

Best English Blister Steel, etc., etc., etc.

All of which are offered for sale on the most favorable terms by
WM. JESSOP & SONS,
91 John street, New York.

Also by their Agents—

Curtis & Hand, 47 Commerce street, Philadelphia.
Alex'r Fullerton & Co., 119 Milk street, Boston.
Stickney & Beatty, South Charles street, Baltimore.
May 6, 1848.

JOHNSON, CAMMELL & Co's Celebrated Cast Steel,

AND
ENGINEERING AND MACHINE FILES, which for quality and adaptation to mechanical uses, have been proved superior to any in the United States. Every description of square, octagon, flat and round cast steel, sheet, shovel and railway spring steel, best double and single shear steel, German steel, flat and square, goat stamps, etc. Saw and file steel, and steel to order for any purposes, manufactured at their Cyclops Steel Works Sheffield.

JOHNSON, CAMMELL & CO.,
100 William St., New York.

November 23 1849.

Railroad Iron.

THE Undersigned, Agents for Manufacturers, are prepared to contract for the delivery of English, Welsh and Scotch Rails, of any pattern and weight, also for every description of English, Welsh, Scotch, and Swedish Iron, Railway Chairs and Spikes, Rivets, Bolts, Nuts, Washers, Chain Cables, Anchors, Tin Plates, German Spelter, Iron Castings, and every description of Machinery.

WILLIAM BIRD & CO.,
Iron and Tin Plate Merchants,
44 Wall st., New York.

And at 5 Martin's Lane, City, London,
and 140 Buchanan st., Glasgow.

July 27th, 1850.

To the Proprietors of Rolling Mills and Iron Works.

THE Undersigned—Proprietors of Townsend's Furnace and Machine Shop, Albany—are extensively engaged in the manufacture of Machinery and fixtures for Iron, and Copper Rolling Mills, and Iron Works. Having paid particular attention to the manufacture of *Rolls* (Rollers), both *chilled* and *dry-sand*, they feel confident that they can execute orders for such castings in a satisfactory manner. And to give assurance of this, they beg leave to refer to the following named persons, proprietors and managers of some of the most extensive rolling mills in the country, viz: Jno. F. Winslow, J. Tuckerman, H. Burden, W. Burt, J. & J. Rogers, Saltus & Co., J. B. Bailey, L. G. B. Cannon, Hawkins & Atwater, etc., etc.

F. & T. TOWNSEND.

Albany, August 18, 1849.

Railroad Iron.

B. O. Railway Tires, Railway Wheels,
Scotch Pig Iron, Tin Plates and Banca Tin,
Muntz Patent Metal Sheathing,
Baltimore Copper.

Contracts for Rails made on behalf of the manufacturers, for delivery at any ports in the United States, at fixed prices.

Bowling Tires and Tire Bars and Scotch Pigs imported to order.

Muntz's Ship-sheathing, and a general stock of Tin Plates and Banca Tin in store, and for sale by
RAYMOND & FULLERTON, 45 Cliff st.

Bowling Iron. Stamped B.O.

Railway Tire Bars Rivet Iron
Locomotive and other Axles Locomotive Frame do
Boiler Plates Bars.

and every other description of this superior Iron.

The subscribers, agents for the sale of Bowling Iron, are prepared to execute orders for importation, especially for railway and machinery uses, with despatch from the manufacturers.

RAYMOND & FULLERTON, 45 Cliff st.

Lovegrove's Patent Cast Iron Water and Gas Pipes.

THE Subscriber, the Inventor and Patentee of the Centrifugal mode of giving form to metallic substances while in a molten state, is preparing to make Cast Iron Water and Gas Pipes, of any dimensions, at prices much lower than they can be made in the old manner, and the pipes warranted to stand a pressure of three hundred pounds to the square inch, and to be soft enough to drill. Steam Engines and all kinds of machinery. Cast Iron Doors and Frames, and Mill Castings of every description, made to order.

THOMAS LOVEGROVE,

Machinist and Founder,

West Falls Avenue, below Pratt st., Baltimore.

Ray's Patent India Rubber Car Springs.

Savannah, Ga., May 22, 1850.

FOWLER M. RAY, Esq.,

Dear Sir: I have no hesitation in saying, after having used on our road your springs and Fullers, that I consider yours decidedly the best in every particular, and in this opinion I am sustained by all our officers. Fuller's spring has a tendency to split, and also to chafe or abrade by the constant friction on the cast iron plates or disc: and in my opinion is not near so elastic as yours.

Your springs, which have been in use on our road for 12 or 15 months past, and in constant use under both passenger and freight cars, are to all appearances as elastic, sound and good, as when first put in use.

We are now building eighty-five new cars, of which for fifty-sets the springs have been ordered of you.

GEORGE A. ADAMS,

Master Carpenter,

Central Railroad and Banking Co. of Georgia.

Connecticut River Railroad Office, }
Northampton, May 4, 1850. }

E. CRANE, Esq.,

Dear Sir: It is now about two years since I first tried the experiment of using a set of Ray's India-rubber Springs upon one of our merchandise cars, and although the car has been in constant service since that time, I do not on examination find the slightest difference either in the thickness or elasticity of the material.

The same result has followed wherever we have applied them, either for wheel or draw springs on Engines, Tenders or Cars. At present we use no other; either in replacing old springs or building new cars—and I am perfectly satisfied that for economy, durability, safety, and ease of motion, that Ray's India-rubber is the best article for Springs which has been presented to the public.

Yours respectfully, **J. HUNT,**
Supt. Connecticut River Railroad.

EDWARD CRANE, Esq.,

Dear Sir: Having applied to cars of the Boston and Worcester Railroad Corporation, Ray's Vulcanized Rubber Springs (where they have been in use for some two years last past), I have had occasion to observe their operation, and am free to say in answer to your inquiries, that they retain their elasticity perfectly during all changes of atmospheric temperature; and are in my opinion a most valuable acquisition to Railroad Cars—are not liable to derangement, as is the case with steel springs; while at the same time it costs less to apply them. Respectfully yours,

D. N. PICKERING,

Supt. Motive Power, Boston & Wor. Railroad.
Boston, April, 15th, 1850.

Monument Foundry.

A. & W. DENMEAD & SON,
Corner of North and Monument Sts.,—Baltimore,
HAVING THEIR

IRON FOUNDRY AND MACHINE SHOP

In complete operation, are prepared to execute faithfully and promptly, orders for Locomotive or Stationary Steam Engines, Woolen, Cotton, Flour, Rice, Sugar Grist, or Saw Mills, Slide, Hand or Chuck Lathes, Machinery for cutting all kinds of Gearing, Hydraulic, Tobacco and other Presses, Car and Locomotive patent Ring Wheels, warranted,

Bridge and Mill Castings of every description, Gas and Water Pipes of all sizes, warranted, Railroad Wheels with best faggotted axle, furnished and fitted up for use, complete

Being provided with Heavy Lathes for Boring and Turning Screws, Cylinders, etc., we can furnish them of any pitch, length or pattern.

Old Machinery Renewed or Repaired—Estimates for Work in any part of the United States furnished at short notice.

June 8, 1849.

**RAILROAD CAR
AND COACH TRIMMINGS.**
Doremus & Nixon,
IMPORTERS AND FURNISHERS

HAVE FOR SALE

Plain Garnet Plush. Fig. Garnet Plush (Butterfly pat.
"Crimson" "Crimson" (Elegant.
"Scarlet" " " (Gen. Taylor.

BROCATELLES.

Crimson Silk Brocates. Gold and Maroon do.
Gold and Blue " " Brown "
Silk and Wool " of every color.

MOQUETTS,

Of elegant designs and colors.

GERMAN CLOTH FOR CAR LININGS.

The most beautiful goods ever shown in this country, and the subscribers are the sole agents for the sale of them.

Oil cloths Enamelled with Gold. These goods can be
Do. Silver ground velvet printed. furnished in any
dimensions req'd.

CURLED HAIR

Of every description and quality.

JNO. W. A. STRICKLAND, Agent.
New York, 1850. 1x16

**FOWLER M. RAY'S
Patent India-rubber Railroad
CAR SPRING.**

New York and Erie Railroad Shops.
Piermont, March 26, 1850.

This will certify that from practical experience in the use of Fowler M. Ray's India rubber Car Springs, I believe them to be far superior to any others now in use.

I have never known them to be affected by any change of temperature, as other Rubber Springs have been affected on this road.

I am at the present time repairing a Passenger Car that Mr. Ray and myself mounted with his springs about two years and eight months since.

The springs are at the present time as perfect, to all appearances, as when first applied to the car.

Respectfully yours,

HORACE B. GARDNER,
Foreman of the Car Shops.

Supt. Office N.Y. & H. R.R.,
New York, March 8, 1850.

This is to certify that we have used the Rubber Springs manufactured by Mr. F. M. Ray for the past twenty months, "both for Passenger and Freight Car Springs and Bumpers, and of different sizes," and have in every case given entire satisfaction, and I consider them the best spring now in use

M. SLOAT, Supt.

Boston, March 5, 1850.

In answer to your enquiry about India-rubber Springs, I have to say that we have used them to a considerable extent on both freight and passenger cars, and also on several of our tenders; and I am very well satisfied that they answer all the purposes for which they are intended. I believe the India-rubber will soon supersede all other springs for cars and tenders.

Yours truly,
S. M. FELTON,
Supt. Fitchburg Railroad.

Office New Jersey Railroad Co.,
Jersey City, March 8, 1850.

FOWLER M. RAY, Esq.,

Dear Sir: In answer to your enquiries respecting the operation of the Vulcanised Rubber Springs, purchased by our company from you some two years since, I reply that they are superior to any spring in use, (that I have either seen or heard of).

The improved form of your spring, consisting of a solid piece of vulcanised rubber with bands on the outside, is far superior to your first form, consisting of disks of rubber with metallic plates interposed.

The last named form was tried, if you recollect, at a much earlier period; and then was replaced by your last form.

I have no hesitation in saying that your springs have given entire satisfaction, and most cheerfully recommend them to railroad companies throughout the country for the following reasons:

1st. The cost is 30 per cent. less.
2d. Saving of weight on each car of 8 wheels from 700 to 800 lbs.

3d. Less care and attention is required, as they are not liable to get out of repair.

4th. A great saving is secured in the wear and tear of the cars and rails from their great elasticity.

5th. The freedom from noise.

6th. There is greater safety in case of accident, as they cannot be broken.

7th. The comfort of passengers is enhanced sufficiently to pay the expense, waiving all the other reasons that I have given.

Should this fail to satisfy any person enquiring, you are at liberty to refer to me, No. 150 Washington St., Jersey City. Yours respectfully,

T. L. SMITH, Supt.

New York, March 11, 1850.

I have used the Patent India-rubber Spring purchased of Mr. Ray, upon the cars of the New York and New Haven Railroad, and have found them efficient and economical; and when applied to the axles and draw springs, believe them to be quite equal to any in use. I have found a combination of these springs with a steel spring under the transom beam a very satisfactory arrangement, and am now using this plan in all new cars.

Yours respectfully,

ROBERT SCHUYLER.

February 25, 1850.

From practical observation of the use of the India-rubber Car Springs, manufactured and sold by your company, we are entirely satisfied in their application, and do not hesitate to recommend them as elastic, durable, requiring no repairs for years, and retaining their consistency during all extremes of weather. We have applied them for the past two years, and consider them superior for all railroad purposes.

Yours truly,

OSGOOD BRADLEY, Car Builder, Worcester.
T. & C. WASON, do. Springfield.
DEAN, PACKARD & MILLS, do. do.
DAVENPORT & BRIDGES, do. Cambridgeport.

Office of the New Jersey Railroad Co.,
Jersey City, March 7, 1850.

This is to certify that we have had Mr. F. M. Ray's India-rubber Springs in constant use under our cars, and as Bumper Springs for upwards of two years, and they have in every way given perfect satisfaction.

The present form of spring we deem far superior to the form of Disk, having used both forms, although we have none of those made in Disks at present in use.

We take pleasure in recommending these springs to all railroad companies.

J. P. JACKSON, Vice Pres.
New Jersey Railroad and Trans. Co.

Roxbury, February 23, 1850.

In compliance with your request, I take great pleasure in stating the result of my experience in the use of "Ray's Patented Vulcanised India-rubber Car and Engine Springs." We have used them nearly two years, and never had one fail in any way. The cold weather does not affect them, as it has other rubber springs we have used.

With sixteen years' experience as superintendent of machinery on the Boston and Providence railroad, I take pleasure in saying that your springs are the best we ever used, or I ever saw used elsewhere. We have 20 cars rigged with them, of which I can say that the springs are as good now as when first applied. I put 24 lbs. of the rubber under the forward end of one of our heaviest engines, taking off 250 lbs. of steel springs—it has been in use 18 months, and is in as good condition now as when first put under the engine.

Very respectfully yours,

GEO. S. GRIGGS,
Supt. of Machinery, Boston and Prov. R.R.

Fall River, February 2, 1850.

In answer to yours of the 20th ult. I would say that this company has for some 10 or 12 months past been using "Ray's India-rubber Springs." We have applied them to both passenger and freight cars with uniform success. They have invariably preserved their elasticity and consistency through all the extremes of weather; and we are now applying them whenever the steel spring fails. I am well satisfied that they are particularly adapted for railroad purposes.

Very respectfully yours,

GEO. HAVEN,
Supt. Fall River Railroad.

Jersey City, March 9, 1850.

This is to certify that the present form of Mr. F. M. Ray's India-rubber Car Spring I consider far superior to the form of Disk, having used both forms.

I take pleasure in recommending these springs to all railroad companies.

DAVID H. BAKER,
Foreman of Car Shop of N.J. R.R. & Trans. Co.

Harlem R.R. Depot,
New York, March 7, 1850.

This is to certify that we have used Mr. F. M. Ray's India-rubber Springs for over eighteen months, and find them to be easy and durable, and recommend them to railroad companies as being superior to anything we have tried.

J. M. SMART,
Foreman at 42d St. Depot.

Old Colony Railroad Office,
Boston, March 6, 1850.

EDWARD CRANE, Esq.,

President New England Car Co.,

Dear Sir: In compliance with your request I would state that the Old Colony Railroad Comp'y have had in use upon their road, India-rubber Springs furnished by your company, for more than eighteen months past, during which time they have been extensively used under Passenger and Freight Cars, Locomotive Tenders, and for Drawer and Buffing Springs, with the most perfect success. The elasticity and consistency of the Rubber has never been unfavorably affected by either extremes of heat or cold—and from the experience which we have had in the use of Rubber Springs, I think them well adapted for railroad purposes—and therefore we have for some months past used Rubber almost exclusively, in all places where springs are required.

Respectfully yours, etc.,

JAS. H. MOORE,
Supt. O. C. Road.

Troy, February 27, 1850.

We have been using your India-rubber Car Springs for nearly two years—and we take pleasure in saying that in our opinion the rubber has to a certain extent already, and may eventually entirely supersede all other Springs for Railroad Car purposes. We now use it entirely for Draw Springs and Bumpers, considering it better and lighter than steel.

During our two years' experience in the use of it, we have not known any to lose their elasticity, or fail in any way; and we cheerfully recommend the rubber for railroad car springs. Very respectfully,
BATON, GILBERT & CO.

Passenger Car Linings.

THE Advertiser continues to order the Enamelled Car Linings which have been so highly approved the last three years, and are now exclusively used by all the Northern Railroads. No pains are spared to get out new styles, and adapt them to the tastes of every consumer.

Orders addressed to **CHARLES STODDER, No. 75 Kilby street, Boston,** will have prompt attention.
March 23, 1850. 2m

India-rubber for Railroad Cos.

RUBBER SPRINGS—Bearing and Buffer—Fowler's Patent—Hose from 1 to 12 inches diameter. Suction Hose. Steam Packing—from 1-16 to 2 in. thick. Rubber and Gutta Percha Bands. These articles are all warranted to give satisfaction, made under Tyer & Helm's patent, issued January, 1848.—No lead used in the composition. Will stand much higher heat than that called "Goodyear's," and is in all respects better than any in use. Proprietors of railroads do not be overcharged by pretenders.

HORACE H. DAY,
Warehouse 23 Courtlandt street.

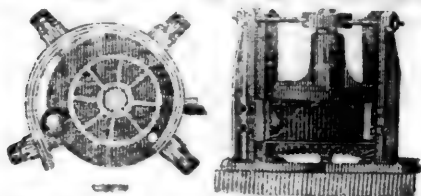
New York, May 21, 1849.

Spikes, Spikes, Spikes.

ANY person wishing a simple and effective Spike Machine, or a number of them, may be supplied by addressing
J. W. FLACK,
Troy, N.Y.
March 6, 1850.

MACHINERY.

Henry Burden's Patent Revolving Shingling Machine.



THE Subscriber having recently purchased the right of this machine for the United States, now offers to make transfers of the right to run said machine, or sell to those who may be desirous to purchase the right for one or more of the States.

This machine is now in successful operation in ten or twelve iron works in and about the vicinity of Pittsburgh, also at Phoenixville and Reading, Pa., Covington Iron Works, Md., Troy Rolling Mills, and Troy Iron and Nail Factory, Troy, N. Y., where it has given universal satisfaction.

Its advantages over the ordinary Forge Hammer are numerous: considerable saving in first cost; saving in power; the entire saving of shingler's, or hammerman's wages, as no attendance whatever is necessary, it being entirely self-acting; saving in time from the quantity of work done, as one machine is capable of working the iron from sixty puddling furnaces; saving of waste, as nothing but the scoria is thrown off, and that most effectually; saving of staffs, as none are used or required. The time required to furnish a bloom being only about six seconds, the scoria has no time to set, consequently is got rid of much easier than when allowed to congeal as under the hammer. The iron being discharged from the machine so hot, rolls better and is much easier on the rollers and machinery. The bars roll sounder, and are much better finished. The subscriber feels confident that persons who will examine for themselves the machinery in operation, will find it possesses more advantages than have been enumerated. For further particulars address the subscriber at Troy, N. Y.

P. A. BURDEN.

Railroad Spikes and Wrought Iron Fastenings.

THE TROY IRON AND NAIL FACTORY, exclusive owner of all Henry Burden's Patented Machinery for making Spikes, have facilities for manufacturing large quantities upon short notice, and of a quality unsurpassed.

Wrought Iron Chairs, Clamps, Keys and Bolts for Railroad fastenings, also made to order. A full assortment of Ship and Boat Spikes always on hand.

All orders addressed to the Agent at the Factory will receive immediate attention.

P. A. BURDEN, Agent,
Troy Iron and Nail Factory, Troy, N. Y.

CHILLED RAILROAD WHEELS.—THE UNDERSIGNED are now prepared to manufacture their Improved Corrugated Car Wheels, or Wheels with any form of spokes or discs, by a new process which prevents all strain on the metal, such as is produced in all other chilled wheels, by the manner of casting and cooling. By this new method of manufacture, the hubs of all kinds of wheels may be made whole—that is, without dividing them into sections—thus rendering the expense of banding unnecessary; and the wheels subjected to this process will be much stronger than those of the same size and weight, when made in the ordinary way.

A. WHITNEY & SON,
Willow St., below 13th,
Philadelphia, Pa.

Brown's Old Established SCALE WARE HOUSE,

NO. 234 WATER ST., NEW YORK.

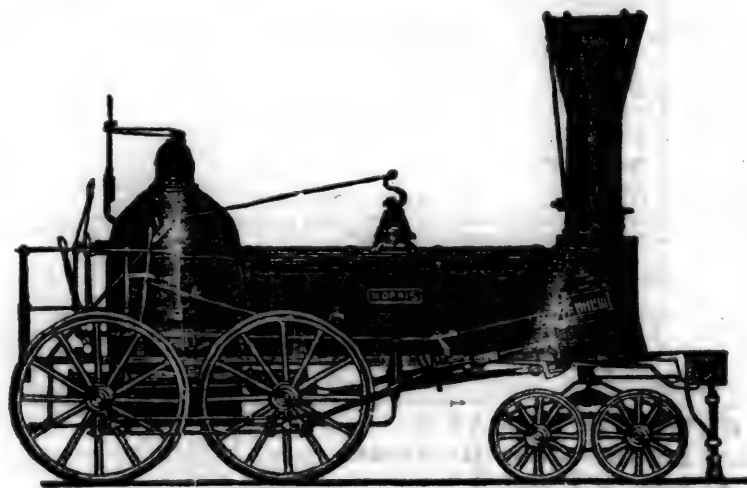
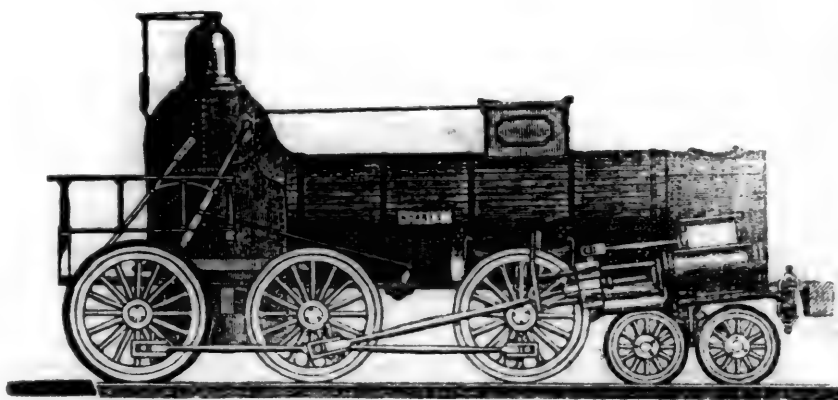
THE Subscriber, Practical Manufacturer of Scales of every description, respectfully asks the attention of Railroad Companies to his Improved Wrought Iron Railroad Track and Depot Scales which for strength, durability, accuracy, convenience in weighing, and beauty of workmanship, are not surpassed by any others in this country.

He is aware that this is rather a bold assertion for him to make, yet he can say with confidence that they have but to be tried to give them precedence over all others.

J. L. BROWN.

Bank Scales made to order, and all Scales of his make Warranted in every particular.

Reference given if required.

NORRIS' LOCOMOTIVE WORKS.
BUSHHILL, SCHUYLKILL SIXTH-ST., PHILADELPHIA,

THE UNDERSIGNED Manufacture to order Locomotive Steam Engines of any plan or size. Their shops being enlarged, and their arrangements considerably extended to facilitate the speedy execution of work in this branch, they can offer to Railway Companies unusual advantages for prompt delivery of Machinery of superior workmanship and finish.

Connected with the Locomotive business, they are also prepared to furnish, at short notice, Chilled Wheels for Cars of superior quality.

Wrought Iron Tyres made of any required size—the exact diameter of the Wheel Centre, being given, the Tyres are made to fit on same without the necessity of turning out inside.

Iron and Brass castings, Axles, etc., fitted up complete with Trucks or otherwise.

NORRIS, BROTHERS

PATENT MACHINE MADE HORSE-SHOES.

The Troy Iron and Nail Factory have always on hand a general assortment of Horse Shoes, made from Refined American Iron.

Four sizes being made, it will be well for those ordering to remember that the size of the shoe increases as the numbers—No. 1 being the smallest.

P. A. BURDEN, Agent,
Troy Iron and Nail Factory, Troy, N. Y.

Etna Safety Fuse.

THIS superior article for igniting the charge in wet or dry blasting, made with DUPONT'S best powder, is kept for sale at the office and depot of

REYNOLDS & BROTHER,

No. 85 Liberty St.

NEW YORK.

And in the principal cities and towns in the U. States. The Premium of the AMERICAN INSTITUTE was awarded to the Etna Safety Fuse at the late Fair held in this city.

November 3, 1849.

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COLUMBUS, OHIO,
Railroad Car Manufactory.
RIDGWAYS & KIMBALL,

HAVE established at this central point, the manufacture of Passenger, Freight, Gravel and Hand Cars for Railroads, and assure all Western Railroad Companies that it will be their constant aim to procure the best materials and workmen, and to turn out the best kind of work at fair prices. Specimens may be seen on the Columbus and Xenia Railroad. The patronage of Railroad Companies is respectfully solicited.

To Inventors and Patentees.

OWEN G. WARREN, ARCHITECT, Has had many years' experience as Agent for obtaining Patents, both in this country and Europe, and will transact such business promptly and reasonably. Persons at a distance can have their business done by correspondence—without the necessity of visiting this city or Washington. Office No. 94 Merchants Exchange Wall st., corner of Hanover st., up stairs.

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AMERICAN RAILROAD JOURNAL.

STEAM NAVIGATION, COMMERCE, MINING, MANUFACTURES.

HENRY V. POOR, Editor.

ESTABLISHED 1831.

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ASSISTANT EDITORS,

J. T. HODGE, *For Mining and Metallurgy.*
GEN. CHAS. T. JAMES, *For Manufactures and the Mechanic Arts.*

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American Railroad Journal.

PUBLISHED BY J. H. SCHULTZ & Co., 136 NASSAU ST.

Saturday, November 2, 1850.

Railroads in the West.

Louisville and New Orleans.

The impulse communicated to the public feeling in the west in favor of railroads within the two years past is truly wonderful. This feeling in the outset was confined to the more enterprising portions of that section of the country where these works were projected as additional means for advancing their interests. The influence which their construction has already exerted in the few instances where they have been built, is so striking, that every town of any importance in the great valley is engaging in their construction as a matter of necessity, to keep pace with their more enterprising rivals, who were the pioneers in this movement. If a town without a railroad does not actually retrograde, it has every appearance of doing so, just as a train of cars leaves behind a horse and wagon, travelling in the same direction. Modern science has entirely changed the mode of the application of our industry. Muscular action, instead of furnishing the motive power, as in times

past, merely *waits and tends* upon the forces now in use. These new agents increase our capacities a thousand fold, and the people who make use of them leave those who do not, as far behind them in ten years, as past generations did their ancestors in a thousand. Every community that desires to maintain its relative position in the great family of nations or communities, must apply these newly discovered agents to their own use. If it cost labor and money to do this, such cost is the penalty demanded by the progress of the age. If a people want cheap food they must provide means of cheap transportation. If they would manufacture cheaply they must supersede the muscular power, by the use of natural powers. They must accept and appropriate the discoveries that science has unfolded, if they would keep pace with those who welcome their aid.

Impressed with these convictions, we find the cities of Louisville and New Orleans arousing themselves to the necessity of doing something to protect themselves from the influence of their enterprising rivals. Compared with other western cities, the growth of these appears stationary.—New Orleans, the focus of all the trade of the west, at the mouth of the grandest river in the world, will be soon outstripped by St. Louis. The northern cities are already draining the fountain springs of her vast trade. We copy the recent language of one of her journals, the *Crescent City*:

"The Atlantic cities, recognising the truth of the axiom that 'their prosperity depends upon their connection with the Mississippi valley,' have been using every effort to perfect a scheme of improvement that will carry the means of communication to every important point on the Mississippi valley. Boston and New York have spread over the north-western States a net work of improvements which has entirely diverted their trade from its natural channel. The tobacco flour, and trade of the State of Ohio, are already gone, or at least we receive but little from her beyond what is necessary for our own consumption. Indiana has forgotten, and Illinois holds but slight intercourse with us.—The fine rivers which are tributary to the Mississippi, and stretch their arms through these States, should naturally have given us their trade; but the eastern cities, looking upon the rich field of commerce which they presented, have, by their internal improvements, overcome our natural advanta-

ges and deprived us of their trade. Other States, learning wisdom from their success, have entered the field of competition, and unless New Orleans arouses herself, the time is not distant when she will lose a large portion of her southern trade. Already is Georgia a formidable competitor for the trade of Middle Tennessee and North Alabama. The main trunk of her railroad now reaches the Tennessee river, and with the liberal aid of the State of Tennessee, lateral roads are stretching forth in every direction.

It is estimated that Tennessee produces about 13,000,000 bushels of wheat and 74,000,000 bushels of corn, and that Middle Tennessee, North Mississippi and North Alabama produce about 400,000 bales cotton, and after making a liberal allowance for home consumption, it will be seen that this very large amount of produce must seek a distant market. Its natural depot is New Orleans, but by a chain of internal improvements, Georgia and South Carolina have already diverted a considerable portion of this trade, and are now struggling for the remainder. What are her prospects may be inferred from the fact that from Huntsville, Ala., to New Orleans, by water, is 1540 miles, while by railroad it is but little over 400 miles to the Atlantic coast. It will thus be seen that the improvements now in progress and rapidly approaching completion, will have a strong tendency to divert from New Orleans a large portion of the trade of the Mississippi valley, as far south as Memphis, unless counteracted by some movement here."

If such is the necessity of New Orleans doing something for her protection, how much more so that of Louisville, which possesses no such pre-eminent commercial advantages? A formidable rival is already rising by her side, and threatens to take the same entirely from her. This rival already numbers a population three or four times greater, with greater wealth in proportion, is pushing her roads in every direction, and is freely extending her aid, where private enterprise may be inadequate to the accomplishment of its objects. We all know that a large town extends its sphere of influence just in proportion as it increases in size. Boston has sapped the commercial prosperity of every other seaport in New England. New York is now making rapid inroads upon the business of all her great rivals. In every section and in every

country, some one city must become the metropolis; the centre of its trade and influence, and gradually absorb the business of all its less powerful rivals. Such is the law of nature as well the result of experience. Every particle of matter has its property of attraction. The greatest mass at-

tracts to itself all the other particles of matter in its neighborhood.

What is Louisville doing? Almost nothing. Cincinnati, on the other hand, secure of the trade of the State of Ohio, has just appropriated \$700,000 to secure that of Kentucky and Indiana. With one road she is pushing into the heart of the former State; with another she is preparing to throw a line across the southern part of Indiana, for the purpose of intercepting her trade from the city of Louisville. Unless this last city makes an immediate move, she has seen her best days. Cincinnati will become the great metropolis of the Ohio valley, and Louisville will bear the same relation to it that Salem, Newburyport and Portsmouth do to Boston, all their vitality drawn from them to give life to that great city, while they are eking out a miserable existence in efforts to retain and create sufficient business to support those left behind.

New Orleans and Louisville must awake from their lethargy. The magnificent local position of the former is no match for the means now in progress to draw from her her trade. She can only defeat this influence by the use of similar weapons. Louisville has no such advantage of situation. A still greater task is imposed upon her. She has already lost the battle. The only thing that remains to be seen is, whether she can recover what she has lost. Will she make the attempt? Every moment lost diminishes her strength, and increases that of her rival. If when on equal footing she allowed the scale to turn against her, how is she to restore the balance when the equilibrium is so much disturbed?

The Isthmus of Panama.

Projected Canal and Railroad across it.

A few weeks since we gave a detailed statement of the condition and prospects of the Panama railroad. The construction of this work within a reasonable time, and with the means provided, may be looked upon as a certain event. Most ample preparations have been made for its successful prosecution, and to meet every contingency that can arise. Those having the direction of affairs are determined to push the road forward with all the vigor and force that can be brought to bear, and their character for wealth and energy is a sufficient pledge that whatever can be accomplished, will be, in the shortest time possible. The completion of one route therefore is secured.

There are two others which are now engrossing much of the public attention, the Nicaragua and the Tehuantepec. Through the former it is proposed to open a passage, by means of a canal, in connection with the river San Juan, and the great lake Nicaragua.

The right to construct this work is held by a New York company, who are now somewhat advanced in the steps preliminary to the commencement of active operations. As will be seen in another part of our paper, this company has succeeded in effecting a loan in England for the prosecution of the work. The question of its feasibility will soon be determined, and if it should be found practicable, we may expect that the work here will be commenced at once. The parties concerned are

men of energy and means, and prompted by their own interest, and by a spirit of rivalry, we may expect that whatever can be done toward opening this line, will be accomplished.

The practicability of constructing a ship canal between the two oceans, within a reasonable cost, we believe to be very problematical. This is the opinion expressed to us by competent engineers, who have enjoyed the means of obtaining the best information that was not the result of actual survey. Such is the opinion of Mr. Squirr, who professes to have made a very careful examination of a greater part of the route. The weight of evidence, to our mind, is certainly against the practicability of this work, and such we are confident will turn out to be the case. We do not believe that the river San Juan can be made navigable for anything more than steamers of light draft, if even for these. But this matter will soon be decided, as the company already has steamers on the ground for the purpose of making the attempt.

The third is the Tehuantepec route. The greater part of the feeling manifested in favor of this route is confined to the city of New Orleans.—There it is regarded as of the utmost importance, from its proximity, and the influence it would exert upon the welfare of that city. As far as California is concerned, it would greatly abridge the distance over the other two routes. The route has been surveyed for a ship canal, which was pronounced practicable, though we do not believe it to be so, within any reasonable limit of cost. It is certainly not unfavorable for the construction of a railroad. The summit to be overcome is about 650 feet, and the country through which the line runs is described as very healthy, and as affording an abundance of all the requisite material. It is likely to receive a very warm support from New Orleans for the reasons stated. A very liberal charter has been granted by the Mexican government, and backed by a strong feeling at New Orleans, we see no good reason to doubt the completion of the work. We certainly think its prospects much more favorable than the Nicaragua route.

The explorations of the Isthmus which have been made with a view to the construction of railroads and canals across it, have proved how little was actually known of the character of the country, or perhaps we should say, how little the difficulties in the construction of these works have been realized. Data, which at the north would be the means of determining the exact cost of the time required to complete any work, are utterly useless for any such purpose there. A "higher law" comes into action, which defeats all calculations from experience.—The climate is fatal to northern constitutions. The natives have but little physical force, and are ignorant and unreliable for steady work. The exuberance of animal and vegetable life there, imposes upon man a constant contest, if he would come off victorious, over these. The Spanish population has completely succumbed to the influence of climate, and are fast retrograding towards a savage state. The Anglo-Saxon race will not so yield to its influence, but they cannot altogether escape from its effects.

The acquisition of California by the United States has given an impulse to the public mind all over the world. The gold which it yields is of considerable consequence compared with the influence which the great migration to the Pacific coast will exert upon commerce and trade, and upon existing political condition of the world. It is the grandest drama of modern times. It is useless to

attempt to calculate the results which will flow from it. They are far beyond our ken, as were the results which have already developed themselves, beyond our conjecture two years ago. We must wait and watch. The actual transcends all that imagination has dared to paint.

Indiana.

Jeffersonville Railroad.—This company was incorporated by the Legislature of Indiana, as "The Ohio and Indianapolis Railroad Company," and, by subsequent enactment, the name was changed to "The Jeffersonville Railroad Co."

The charter authorizes the company to construct a railway from Jeffersonville to any point or points in the State, and to construct such lateral branches as the board of directors may deem proper; with authority to connect their road with the Madison and Indianapolis railroad at or near Columbus, and to run their cars upon said road from the point of intersection to Indianapolis.

The propriety of this connection is to be judged of by the Jeffersonville company. The charter is perpetual, and the company not limited in amount of profits. The directors have decided to construct a road from Jeffersonville to Columbus, and the line between those places has been located, and will be 66 miles in length, and only one mile and a half longer than a straight line. The highest point on the grade line is only 172 feet above high water mark of the Ohio river at Jeffersonville, and this summit is reached by easy grades in a distance of 23 miles; the maximum on this line of 66 miles is 26.4 feet per mile, and on 44 miles the grade line of the road way is level, or less than 10 feet inclination per mile.

The cost of the road, 66 miles, complete with heavy T rail, exclusive of buildings and machinery, is estimated at \$532,259 30, being an average of \$8,064 42 per mile.

The clearing, graduation and bridging are estimated at \$153,472.

The grubbing and clearing of the whole line is nearly completed, and 38 miles of it graded and ready for the superstructure; and the greater portion of the residue of the grading is under contract, and will be prepared for the superstructure as speedily as possible.

These contracts are taken by parties residing along the line, and are to be completed by September, 1851, for which they are to receive pay in the stock of the company.

The first 16 miles of the road is being laid with T rail, and one half of it is now in use, the cars carrying upon it the timber, iron, and ballast for the track. It is the intention of the directors to lay the whole road with substantial T iron.

There has been expended in construction of road, purchase of real estate, locomotive and cars, to 10th September, 1850.....\$167,677 57
Stock subscribed not yet collected..... 253,402 00
Stock to be issued for work under contract..... 30,800 00
Estimated value of depot grounds, and other real estate, exclusive of right of way..... 48,300 00

Stock and property of company.....\$500,179 57
The liabilities to the 10th September, 1850, to be provided for in cash.... 38,079 57

Excess of assets.....\$462,100 00

Of the stock subscribed, \$100,000 was taken by the city of Jeffersonville, \$40,000 to be paid in annual instalments of \$10,000, closing with the year 1853.

For the residue of that subscription, viz: \$60,000, the city has executed her bonds to the company to become due in 15 years from the 1st of July, 1849, with 6 per cent. interest, payable semi-annually. The first instalment was promptly collected and paid over, and the requisite assessment for the second instalment has been levied by a unanimous vote of the city council, and collections will immediately commence.

The company has not sold any bonds, nor given any lien or mortgage on the road or any other property.

Valuable grounds at Jeffersonville, containing near 20 acres, for depots and shops, and other grounds, containing from one to six acres, have been procured at convenient points for depots and water stations. The company also have near 2500 acres of land, which was selected for the purpose of furnishing the road with timber and stone.

The construction of this road will open a direct communication between the Ohio river, the cities of Jeffersonville, in Indiana, and Louisville, Kentucky, and the railroads of Indiana, and by means of these with all the roads in the country. In connection with the Laurenceburg railroad, it will open a tolerably direct connection between Louisville and Cincinnati, the two great cities on the lower Ohio. As Louisville is the great market for that part of Indiana penetrated by this road, as well as one of the most important cities in the Ohio valley, this must of necessity be an important line, both for its local traffic, and its through business. In connection with the projected road from Louisville to Nashville, and which must before many years be constructed, it will form a part of one of the great northern and southern lines running thro' the United States.

But little idea can be formed of the amount of income from the road. For the reasons stated, it must of necessity be very large, and give a large income on the small cost of the work. The estimate of the chief engineer of the road is as follows:

No of passengers per day estimated at 150. These at \$1 50 fare, will give a revenue of.....	\$70,425 00
Income from local traffic.....	126,530 00
	196,955 00
Expenses and maintenance of road 50 per cent.....	98,477 50

Leaving for net profit.....\$98,477 50
Adding to the cost of the road \$157,000, the additional sum estimated as necessary to equip the road, and cover the necessary expenses not provided for, the net profits will be 14 per cent. upon the whole cost. The estimated income we believe to be much below the mark. This will be found to be the case with the cost of the road. These are almost always found to be too low. Still we believe the net income will for a long time come up to the estimate. With this income the road would not pay better than other investments could be made to yield in the west. Money is worth more in the west than in the east, and a greater return is properly expected.

The following are the officers of the company for the current year:

A. Wathen, Woods Mabury, Wm. D. Beach, S. Merriwether, George F. Savitz, Wm. F. Collum, Henry French, of Jeffersonville; James Guthrie, Wm. A. Richardson, Jas. Keigwin, of Louisville; Benj. Irwin, of Columbus; Jno. J. Kester, of Rockford.

Wm. G. Armstrong, President.
J. H. McCampbell, Secretary and Treasurer.
Benj. F. Marsh, Principal Engineer.

Why do not Railroads Progress as Fast at the South as at the North?

One great reason why railroads do not progress in the Southern States with the same rapidity which we witness in the North, is the nature of the pursuits of our Southern brethren, and the almost entire lack there of large towns. The roads projected in that quarter are consequently chiefly *through routes*, and hold out little encouragement of an income until they are completed. Stockholders therefore are generally unwilling to have the work of construction commenced, unless all the means necessary are secured. If these are not provided, they fear that only a part of the line may be completed, involving a loss of all they may be called upon to contribute. The failure of many of the early projects in that quarter, from this cause, are now constantly pointed to, whenever new ones are presented. At the North, on the other hand, the people have no hesitation in commencing with whatever sum can be raised, trusting to the future to provide means for the future, and knowing that whatever portion they can complete, will be pretty sure to pay a reasonable income on its cost. The more dense population, and the great number of large manufacturing towns with which this portion of the country is filled, gives a much larger local than through business to all its roads. In the North we do not hesitate to commence the work of construction as soon as the means raised afford the slightest apology for doing so, feeling that every cent expended, is so much accumulated strength for further progress. In the South exactly the opposite feeling prevails. They see that the opening of a *part* of a line would show an unfavorable result, not justified by the merits of the route as a whole; that these results may discourage further progress. They do not dare to trust themselves upon a sea of uncertainty, with that confidence which at the North is the result of greater experience, and a more favorable condition of things.

Another cause of the superior progress of the North, is in the more perfect concert of action which prevails there. This results from a more familiar intercourse, and from the commercial pursuits in which so large a portion of its people are engaged. These bring people together, and beget habits of business, and a greater reliance on their own ability to carry out such works, than can be expected from a people engaged almost entirely in planting, an occupation which from necessity isolates men from each other. Mankind are always suspicious in proportion as they are unacquainted with each other, and never can cordially unite upon any object unless familiarity of intercourse has diffused a similarity of habits and ideas.

There are many projects at the South, the commencement of which are delayed simply for the reasons we have stated. The schemes are good, and hold out every promise of success, if they can be realised, but the whole means necessary cannot be obtained at the outset, and those interested will not start without them. Now if the North had acted upon a similar rule, not one quarter of its roads would ever have been constructed. The people there commenced with such means as they could get. Take as an illustration the Atlantic and St. Lawrence railroad. The part of the line of this road in the United States is about 150 miles long, requiring between four and five millions of dollars for its completion. Not \$100,000 of this sum could be obtained out of the city of Portland, upon which the whole burthen of the road fell. That town contained, when this road was commenced, about 17,-

000 inhabitants. In the outset it raised by private subscription \$1,000,000, a sum required to organize the company. With this sum the work of construction was vigorously commenced, and when it was exhausted, the city got liberty from the Legislature to lend, in its corporate capacity, its credit to the road for \$1,000,000 more. With the private subscription, and with a small portion of the city loan, the road was completed to Paris, and yielded a profitable return on its cost. All expended up to this point was so much invested capital, which could be made the basis of other loans. The success of the road induced the city to apply for liberty to lend its credit for the additional sum of \$500,000, which was granted, and with these sums, together with the proportion of stock taken by contractors, and with the further aid which could be obtained from private sources, the whole road will be constructed, with ease and despatch, by a town which now numbers only about 20,000 people!—See what one small town can accomplish when its efforts are guided by courage and conduct.

If the South would keep pace with the North, she must follow her example. Her people must commence their lines with such means as they can muster, and trust to the future for the necessary balance. If a road as it progresses will not pay so well as at the North, the very act of commencing the work will exert a strong influence in favor of its completion. It will interest the people in it.—This interest will diffuse itself through the whole community. From a lukewarm, they will gradually learn to give it a warm support. Its encouragement will soon come to be the great topic of interest in the community. Where people in the outset gave grudgingly and hesitatingly, they will learn to give freely and cheerfully. Means will be proffered which were once refused. It will soon gain so strong a hold upon their affections, that the people will entertain no such word as fail. Pride as well as interest becomes involved in their success.

It is the progress of the work alone that will work this wonderful change. The road itself will communicate to those building it just such qualities and that state of feeling necessary to its proper management and final success. Unless in the cases supposed, the work of construction is commenced, it will be impossible ever to dispel the indifference and listlessness manifested in the outset, and which stands in the way of all action.

TEHUANTEPEC ROUTE.

A meeting of the permanent committee on the Tehuantepec railroad was held last evening at the office of the Crescent Mutual Insurance company, Mr. Peter Conrey, Jr., presiding.

Mr. Benjamin stated that at the last meeting of the committee, a sub-committee was appointed to prepare an address to the people of the U. States, soliciting aid in the Tehuantepec enterprise, of which committee he (Mr. Benjamin) was appointed chairman. The committee had not yet been able to prepare the address, but he had drawn up a report, comprising a considerable amount of information to the citizens of New Orleans, which had not yet been laid before them.

Mr. Benjamin then read his report, which is very voluminous, and highly interesting. It is very ably drawn up, and contains a large number of important facts, with which we were previously unacquainted. It fully explains the nature and advantages of the original grant, for the right of way across the Isthmus of Tehuantepec, and the trans-

fer of all these rights and privileges to the trustees of the permanent committee in New Orleans, with power to make a transfer of them to a company as soon as one is formed. The articles of agreement with Mr. Hargous, are all given. We shall publish the report in full at an early day, and therefore omit details at present.

The report was adopted, and Mr. Benjamin stated that all difficulties and doubts in regard to the enterprise were removed, and that it only remained for the citizens of New Orleans to act.—The disposal of the lands along the route, continued Mr. B., will in time more than pay for the road, and the work will commence paying as soon as the company organizes. The company can immediately start a communication across, by means of mules and carriages, and a considerable portion of the California travel can be secured at once. The towns which will spring up at each end of the road will be the property of the company, and the sale of lots will produce a large sum of money. Judge Larue moved that the report be published in all the papers of the city. The motion prevailed, when—

Mr. Benjamin stated that it was necessary to raise some twenty or thirty thousand dollars for present uses in making surveys, etc.

Judge Larue moved that the committee open an office for the purpose of receiving subscriptions to the stock of the company, which was now sure to be organized. Subscribers are to pay in five per cent. on the amount subscribed, the same to be credited to them when the books of the company are opened. The motion prevailed.

Mr. Mathews offered a resolution, appointing a committee of twenty citizens to wait on the Governor, and solicit him to call an extra session of the Legislature immediately, with a view of having the general corporation laws altered, and a charter given to the company. The resolution was adopted.

Judge Larue moved that a committee of ten citizens be appointed to draft a memorial and obtain the signatures of all our citizens, praying for an extra session of the Legislature. The memorial is to be carried up by the committee of twenty, and presented to the Governor. The motion was adopted.—*Crescent City.*

The Coal Trade for 1850.

The quantity sent this week by railroad is 49,556 02, being an increase of 1221 tons over last week.

No obstruction has occurred to the trade during the week, except the detention of a portion of the Cars intended for Broad street, at the intersection of the road with the State Works. This trade has been suspended for the present, until the causes of detention have been removed.

Should no detention occur, it is believed the supply next week will reach 50,000 tons, by railroad. The average weekly supply last year—by both canal and railroad, to December 10, was about 48,500 tons. The supply of Coal from this region this year, will be about the same as last year, unless the weather should remain unusually favorable for transportation. So far we have been highly favored in this respect.

The demand for all kinds of coal, continues brisk, particularly for white ash lump, and prices have advanced, for choice kinds, 12½ cents per ton.

So far the Philadelphia and Reading railroad company have made no arrangements with the Schuylkill navigation company for an additional supply of cars—nor do we believe any arrangement will be made, as the shipping season is rapidly drawing to a close. After that period their own stock of cars will be more than sufficient to accommodate the city and line trade during the winter season.

The whole quantity of coal sent to market this year to Sept. 1st, from the Wilkesbarre region by

the Pennsylvania canal, is 147,860 tons, being about 105,000 tons less than last year. The canal was not navigable during the month of September, and consequently the supply could not be increased to October 1, the time at which their year closes.

The great increase in the number of ocean steamers built and being built in 1850 (an account of which will be found in another column of our paper) is unparalleled in the history of this or any other country, and will largely increase the market for coal hereafter. A large portion of these steamers will use anthracite coal.—*Pottsville Miners Journal.*

The Nicaragua Canal—Loan Negotiated.

The junction of the Atlantic and Pacific may almost be regarded as a work commenced. On the 13th of February, 1849, we described the Nicaragua route, urging the attention of capitalists to its advantages; and the American company, by whom agents were subsequently dispatched to obtain a concession from the government of that country, have now not only two steamers upon the waters of the San Juan for the purpose of establishing a temporary transit, but have also a corps of twelve engineers actively engaged in the surveys for the canal. The head of the party is Mr. O. W. Childs, lately chief engineer of the State of New York, under whose charge was conducted the recent enlargement of the Erie canal.

The Nicaragua route to California, across the Isthmus, saves 900 miles, as compared with Panama, and has the advantage of a healthy climate.—Hopes seem to be entertained, moreover, that the temporary transit, when it shall be fully organized, may be accomplished in 24 hours. It will commence from Grey Town, ascend the San Juan, and cross the lake to the city of Nicaragua, where a land journey of only 15 miles remains to reach the Pacific. The contemplated fare for the passage is \$50, including 250 lbs. of baggage for each passenger. This is lower than the charge at Panama, and consequently the saving of distance and the advantage of health will be also accompanied by a more than proportionate diminution of expense.—Nothing in connection with the present movements on the Pacific will be watched with more interest than these proceedings. It has been commonly reported that the number who crossed the isthmus last year was 70,000, and the lowest estimate was 50,000. The increasing excitement regarding California, and the shortening of the distance, coupled with the removal of inconveniences and dangers, give the stimulus of still better prospects for the future. Should everything go, therefore, as smoothly as appears to be calculated upon, a year or two can hardly elapse before results may be realised from this new opening, more remarkable than any that have yet been dreamed of. The course proposed for the temporary transit is the same as that which was surveyed by Lieut. Bailey in 1837 for the canal. The company find, however, that there is every prospect of a large saving being effected by carrying the permanent work to a more northern terminus, described in the pamphlet of Prince Louis Napoleon. Mr. Bailey's estimate of £4,000,000 for the cost of its construction is in excess, therefore, of that which they entertain, and the change of route, which reduces the elevation to be crossed from 487 feet down to 56 feet, has also the advantage of bringing them to the port of Realejo, the finest on the Pacific, and about 130 miles nearer to San Francisco.

The charter granted by the State of Nicaragua provides that the canal is to be completed in twelve years. The company are to have the exclusive enjoyment of it for 85 years after the date of completion, and to receive 15 per cent out of the net profits for the further period of 10 or 20 years.—Meanwhile they are to have a monopoly of the temporary route. They are also to have the exclusive privilege of steam navigation and of road making throughout the entire State for 97 years, together with a free grant of eight sections of land of six miles square, to be chosen by themselves on the banks of the canal. In return for these privileges, the State of Nicaragua is to receive nothing, with the exception of some minor payments, until 7 per cent shall have been paid to the stockholders. Of all profits exceeding 7 per cent, it is to receive one fifth during the first 20 years, and one fourth there-

after. The minor payments consist of £2,000 per year until the completion of the canal, and a donation of £40,000 of its stock.

The two governments of Great Britain and the United States have bound themselves to the enterprise by a treaty of protection. All the other powers will accord to it the same advantage. The territory around it will constitute the first neutral ground, whence, by the pledged faith of all civilized nations, strife must be forever banished. It is the grandest physical work the world can witness. The past has seen nothing like it, and any similar fame must be equally denied to the future, since there will be no more hemispheres to join. Is it destined, it will be asked, that in a design which must thus stand alone and unapproachable in the records of material progress, England, as an active agent, is to have no part? From all that appears on the surface, the answer would be in the affirmative; and looking at it as the penalty of a mania in which it was denounced as treasonable to question the spending of £300,000,000 a year in analogous operations, the humiliation would be as deserved as it would be ineffaceable. Happily, however, it has been averted.

Throughout their entire negotiations, it has always been known that the New York company have desired that the work should be one of co-operation between the two countries, and in this spirit, although surrounded by violent political influences that would have urged a different result, a promise was given to Sir Henry Bulwer that an equal participation in the enterprise should be offered to this country on reasonable terms. To fulfil that pledge two commissioners from the company, Messrs Vanderbilt and White, arrived in London on the 6th ultimo, and after a short period of negotiation, a satisfactory arrangement was completed. That such has been the case, it must at the same time be stated, is owing to the straightforward and moderate requirements of the New York company, and to the sagacity and patriotism of our two leading mercantile firms, and also of the governor of the Hudson's Bay company, Sir Henry Pelly. By the course which has been adopted, these parties, conjointly with others, will possess the power of offering to the British public in due time one half share of the enterprise, the exercise of which power will depend, we understand, upon its being demonstrated to the satisfaction of government engineers that the estimates of outlay and income will be such as to warrant the most unquestionable reliance. The offer, therefore, will not be put forth until several months further experience of what is passing on the coast of the Pacific shall have enabled all persons to judge for themselves as to the eagerness or otherwise with which it should be accepted, and we are disposed to anticipate that enough will speedily transpire to render it certain that the undertaking will then be pushed to completion by the accumulated force of a blended confidence and enthusiasm, such as will more than compensate for all our past delays.—*London Times, Oct. 14th.*

The Hudson River Railroad.

A SKETCH OF ITS HISTORY, AND PROSPECTIVE INFLUENCE ON THE RAILWAY MOVEMENT.

It has been justly said of the railway, that it marked "an epoch in the affairs of mankind."—Since the experiment of the Rocket on the Liverpool and Manchester railway, a totally new impulse has been given to improvements in the means of intercommunication. Numerous localities were readily found, well adapted to this new method, and railroads multiplied rapidly. They have gradually improved in stability of structure, ease of line and grade, and in the machinery they bear, producing greater speed, safety and comfort to the traveller. But high as they were held, for routes usually adopted, the idea that they could successfully compete with the steamers on the Hudson, was regarded in general as preposterous. In this view, the history of the Hudson river railroad affords an interesting instance of the working of the public mind, on a project whose origin was marked by almost universal incredulity. In addition to the formidable competition of the river steamers, it had a rugged, difficult and expensive line to execute; seen daily by thousands from the splendid steamers ploughing majestically in the smooth, deep waters of the Hudson, they could only regard the Her-

culean labor of constructing a railroad on its margin, as a wild, visionary, and unpromising enterprise.

In 1842, the citizens of Poughkeepsie, and other towns on the banks of the Hudson, employed Mr. R. P. Morgan, a civil engineer, to make surveys, with a view to ascertain the feasibility of the route along the Hudson river, for a railroad from New York to Albany. Mr. Morgan started from the Harlem railroad, where it crossed the Harlem river, and followed the north bank of the river to its junction with the Hudson, thirteen miles north of the city of New York, and thence followed the eastern shore of the Hudson from the river ascending to the general elevation of the table land, which he pursued to Kinderhook, and then descended the river at Albany. He made a map and profile of the line, which he submitted, with a report and estimate of the cost of construction, all presenting a very favorable view of the project. With these, the friends of the measure went forward, to procure from the Legislature authority to construct the work. But the measure was regarded as chimerical, and an act of incorporation was refused.

At this time there was much anxiety for a railroad between New York and Albany, and many attempts were made to promote such a work; but it was generally supposed it must be made on an interior line, far removed from the river, that could support itself without reference to the river competition in the season of navigation; for it was believed by very few that the railroad could even transport passengers in competition with the steamboats on the Hudson. It was therefore thought, that to have the benefit of a railroad in the winter season, it must be carried so far back in its main line from the river, that it could do a summer business. In this view, a charter had been obtained about 1833, and a company organized to construct the railroad. This company did very little, and finally their rights were merged in the Harlem railroad company, or forfeited by neglect.

In the session of 1845, several gentlemen of the city of New York made application to the Legislature for a new charter, with the privilege of taking an inland or river route, as they might find expedient on full surveys of the same. They did not succeed in this application.

In the month of September, 1845, a convention assembled at Poughkeepsie, to consider the project of a railroad between New York and Albany along the near bank of the Hudson. They appeared to regard Mr. Morgan's line as the basis of their action. Mr. Morgan, in his report, gave a favorable account of his line along the table land, which, leaving the rugged shore of the river for more than eighty miles, no doubt had a large influence with many persons who regarded the river shore as very formidable for a railroad. Still there was not sufficient confidence in his survey and estimates to induce the commencement of any serious efforts towards its construction, without some farther surveys, and the convention appointed a committee to procure a more full survey of the route between New York and Fishkill landing.

A short time after the meeting of this convention, James Boorman, Esq., called on the writer, John B. Jervis, and requested him to make a survey, as above, and then to make a reconnaissance of Morgan's line from Fishkill landing to Albany. Mr. Boorman stated that he was authorized to say that \$1,500 would be raised to defray the expense.* This sum of \$1,500 was small to make a survey, maps, estimates, and report, on such a line, sixty miles in extent; but, by allowing no compensation to the Principal, except in the event of a successful organization of the company, and employing some portion of the assistant engineers, who would be willing to engage on the basis of future employment, if the project should succeed, a party was organized, and kept in the field near two months; and a portion to make maps and calculations, some six weeks longer. The expense, including \$142 for engraving and printing, was about \$1,200; the remaining part of the \$15,000 being appropriated to other objects in the prosecution

of the project. With this slender means, a large amount of information was obtained, as to the character of the line, the difficulties, and the cost of construction. It did not admit, however, of a definite formation of plans, nor the labor of a thorough sounding of the bottoms of the numerous bays that were crossed by the line, and the sinking of trial shafts, to ascertain the character of the work.—These were all necessary to a thorough estimate of the cost of construction; but the limited means were only sufficient to obtain approximate results. The result of this survey, and a reconnaissance of the line of Mr. Morgan, from Fishkill landing to near Albany, together with remarks on the importance, the feasibility, and productiveness of the work when constructed, were presented in a report by the writer, and was read to a meeting assembled at the request of the committee in the University of New York, on the 23d of January, 1846. The meeting was called to order by Stephen Allen, Esq., and Mayor Havemeyer appointed chairman. James Boorman, Esq., remarked on the history of the project, and the difficulties it had to encounter.

After the reading of the report, resolutions were offered by S. Allen, Esq., and Gen. James Tallmadge, strongly approving the project, which were unanimously passed.

The meeting was highly respectable in point of numbers and character. The project was fairly laid before them, and all seemed anxious that the work should be done, and appeared to regard it as much wanted to promote the interest of the city.—It was evident, however, that it lacked one element essential to such projects—that is, confidence in its ability to remunerate the outlay required. All were ready to speak favorably, but very few ready to take any pecuniary responsibility. In this state of the project, application was made to the Legislature for an act of incorporation, and memorials were circulated for signatures. Opposition to the measure soon manifested itself from various quarters, and little hope could be indulged of success without the personal attendance of some friend at the seat of government. On the 17th of February, the small number of friends to the project, who were disposed to contribute their attention, and give some direction to its interests, had a meeting for consultation. At this time they were composed of James Boorman, Stephen Allen, Saul Alley, Robert Kelly, James Hooker, and the writer. The main question discussed was, who should proceed to Albany to prosecute the application for a charter. No one of the number was disposed to make this sacrifice; but finally the writer agreed to undertake the duty, and his associates agreed to pay \$275 towards the necessary expenses. On the 20th, 20th, a memorial, reasoning the case, and urging the action of the Legislature, was signed by the above, and by James N. Wells, and P. A. Cowdry.

The opposition to the act of incorporation was mainly concentrated in the Harlem company.—They regarded the Hudson river project as adverse to their interests, and they made all the opposition they could to its success. Many of the land owners on the banks of the river, were violently hostile to the projected railway, and united their efforts to defeat it. Various reasons were urged; but the one that had the most influence was, that the granting this charter would discourage capitalists from going forward with the Harlem road, and that there was no reasonable probability the friends of the Hudson river could obtain sufficient funds to construct it, even if they obtained an act of incorporation, and the granting them authority would only result in procrastinating the construction of a railroad on either route. Other parties were more or less active, as they regarded the project as likely to interfere with their interests. After a struggle of nearly three months, the act of incorporation was passed, whereupon the friends of the enterprise were duly organized for the business of obtaining the necessary funds.

The great question was to obtain a subscription of \$3,000,000 to the capital stock. To obtain the funds necessary for so great a work, in the face of strong opposition from adverse interests; with the public mind deeply impressed with the magnitude and difficulty of the undertaking, and, moreover, with the idea, that in the face of a competition with the most splendid boats on a route unsurpassed

for their purpose, its traffic would not afford remuneration, was a task that few were willing to encounter. Competition with steamboat navigation was the peculiar feature in the traffic of the projected railroad; and this was an untried peculiarity. In the face of great discouragements, the board of commissioners had frequent meetings, and devoted much time in collecting information. On the 10th of June they published a prospectus, in which they set forth their views, and expressed the most entire confidence in the importance and productiveness of the proposed work. In September following, subscription books were opened; few, however, were obtained, except those of the commissioners themselves. They continued to exert their efforts in every way that promised success; by the publication of short articles in the newspapers, and more systematic essays in pamphlets, taking subscriptions from individuals as they could be persuaded, and enlisting all to assist, that could be induced to aid, by their influence on others.—The considerations of the importance of the project to the commercial and social interest of the city and state, were enforced with unwearied perseverance, until the population of the city and river towns were aroused to a state of excitement greatly in contrast with the feeling that existed in the early history of their effort. The result was, the completion of a subscription of \$3,000,000 to the capital stock of the company by the 1st of March, 1847, the day limited by the charter.

On the 4th of March, 1847, the company was organized by the following gentlemen, under the act of incorporation, as directors, namely:—Stephen Allen, James Boorman, Saul Alley, William Chamberlain, Robert Kelly, Gouverneur Kemble, James N. Wells, Gardner G. Howland, James Hooker, Aaron Ward, Fortune C. White, Thomas Suffren, and the writer. William Chamberlain was elected President, and the writer. (John B. Jervis,) Chief Engineer.—*Merchant's Magazine*.

To be continued.

Ohio.

Cleveland and Pittsburgh Railroad.—The work of this important road is progressing vigorously under the supervision of the very efficient president of the company, Cyrus Prentiss, Esq., and the energetic board of directors. The speedy completion of the road is now placed beyond a contingency, and a recent inspection of the work from the lake termination to Bedford, 11 miles, demonstrates that no expense and labor have been spared to give permanency and durability to the iron way. The line is admirably located, is of low grades and quite free of curves, the ascent from the lake being a grade of only 36½ feet to the mile, the highest on the line, except one of 50 feet in leaving the valley of the Ohio river.

The line of piles driven for the protection of the road along the front of the city is found to fully answer expectations, and with the perpendicular piling the company intend to put in next season, cannot fail to render it permanent. The company have purchased a tract 600 feet in length, running from the top of the lake bank to the water, in the immediate vicinity of the intersection of the Cleveland and Pittsburgh with the Cleveland, Columbus and Cincinnati railroad, for depot purposes, &c.—They will construct a broad pier into the lake on their grounds and contiguous to Bank street. Piles for the pier will be driven the coming winter, should the ice prove favorable. Bank street will probably be graded up to Lake street next season, thus affording one of the most feasible and delightful avenues to the lake and harbor in the city. No more desirable or valuable location for the terminus of the road could be found. It gives easy and immediate connection with the city, with the Lake Shore and Cincinnati railroads, and with the steam and sail marine of the lakes.

The company have 25 acres advantageously located contiguous to the city on St. Clair street, for their principal depot, machine shops, &c., &c.—Here they have erected a machine shop 150 feet by 50, in which they have a steam engine of 45 horse power and machinery for the manufacture of freight cars already at work. The smith's shop in connection is 50 by 30 feet. A circular engine house 133 feet in diameter is to be erected, with stalls for locomotives and all modern conveniences. A de-

* Subsequently the committee, composed of James Boorman, Saul Alley, and Myndert Van Schaick, Esqrs., had a meeting, (which the writer attended,) and decided to proceed with the survey.

pot building, 140 by 100 feet, will be put up by the 1st of December. Sufficient water for the purposes of the company will be brought in the Middlebury stone pipe from springs in the vicinity, which afford proper elevation for water tanks, &c. Lake street is to be extended beyond the depot, and cross streets have been laid out and are being improved. A few years will see the well known Case farm, on which these grounds are situated, a populous, manufacturing portion of Cleveland. The railroad passes through one of the best coal sections of the west, and the cheap fuel it will afford, the cheap locations, cheap labor, cheap provisions, unequalled health, facilities for shipment, and ready market for manufactured articles Cleveland offers, must attract capitalists and manufacturers to this favored spot.

As we have said, the road is constructed in the most substantial manner. The grading and preparation for the ties throughout the line are well done. The ties are oak, none of less than 8 inch bed, usually much wider, and are placed but 2 feet apart from centre to centre. The abutments for bridges and the culverts are solid masonry; the culvert over Wood Creek, built by Mr. Garfield, of Newburgh, being pronounced a better job than similar New England railroad structures. The bridge over Tinker's Creek, is a great work, the heaviest on the line of the road. The span is 232 feet, and the cars will pass at a height of about 130 feet from the bed of the stream. The massive stone abutments, about 60 feet high, are founded on solid rock. The bridge is a single span and arch, on Howe's Improved Plan of Railroad Bridges. It is constructed of Canada pine, without tenons, and reflects great credit on the builders, Messrs. Thatcher, Boomer & Co. The gulf of the creek is wild and romantic, and the crossing at the flourishing village of Bedford will be a feature in the railroad trip from Lake Erie to the Ohio river.

The entire iron for the line from the lake to the Ohio has been purchased, paid for, and shipped from England. The rail is a heavy T rail of the most approved pattern, from English manufacturing establishments of established character. Tests of the iron received show the quality to be excellent. The contractors are laying the track at this point and at Ravenna. Here a locomotive of the best class from the Taunton Works, Massachusetts, is employed in transporting the iron, &c., for the track, and at Ravenna two second hand engines are also at work. Cars will be running from Cleveland to Ravenna, 40 miles, by the first of December next, and to Haun's Run, 30 miles beyond Ravenna, by the 1st of January. The line to Wellsville on the Ohio, 28 miles further, is to be completed by the first of July, 1851. Some of the passenger cars, from the celebrated manufactory of Gilbert & Co., Troy, are now in Buffalo, and will be landed here in a few days.

Of the large amount of profitable business and travel on the road, through and way, none familiar with the route and the country through which it passes can doubt. The line touches a number of flourishing villages with partially improved manufacturing advantages, and is located through an old and populous portion of Ohio its entire distance—a rich grain, wool, and dairy producing section—where there are no waste lands and uncultivated acres. It taps the great wheat granary of Stark, Carroll, Columbiana and Jefferson counties, and will prove an outlet for a portion of Ohio producing not less than 2,000,000 bushels of surplus wheat in seasons of abundant harvests. The road passes down the famous coal valley of Yellow Creek—the coal, of a superior quality, cropping out so conveniently that inexhaustible supplies can be delivered into coal cars at a trifling cost per ton—the transit of which for lake steamers, manufacturing, and general consumption, will be an important item of railroad business. The road will be one of low grades and rapid travel, as well as shortest between the crowded lakes and river thoroughfares. In low stages of the Ohio it will be the popular route between Cincinnati and Pittsburgh. It intersects the Pennsylvania and Ohio railroad, and brings the Iron City into proximity with the thriving towns and cities of the upper lakes, and the rapidly developing resources and commerce of the almost limitless Northwest.—*Clev. Herald*.

Central Ohio Railroad.—The question of Guernsey subscribing \$100,000 to the stock of the Central Ohio railroad has been carried in a popular vote of nearly 300 majority.

This \$100,000 of stock is the first solid step of the Central Ohio railroad towards the Ohio river from this point. Between this place and Columbus, the road will be finished and in operation by November of next year, and as the railway connection from Columbus to Cincinnati is already perfected, and as the Baltimore road will be finished to the Ohio river by the summer of 1852, a continuous railway connection from Cincinnati to the Atlantic seaboard over the Central Ohio line can be made complete by 1853, if the friends of this greatest of the western routes shall properly bestir themselves in the meantime. One hundred thousand dollars more can be obtained from Muskingum and her citizens. Guernsey must do something handsome individually. Belmont should awaken; and Wheeling, if she would secure a prize, must begin to brace herself to her best efforts; and by union and energy the road can and should be built by 1853.—*Zanesville Cour.*

How the Virginians Talk among Themselves.

We give the following abstract of a speech recently made by W. P. Tunstall, Esq., President of the Richmond and Danville railroad, at a recent railroad meeting in that State. To effect a cure, it is necessary to understand the nature of the disease, and the people of Virginia are getting to understand pretty well what is the trouble in that State:

He said in 1769, six years before the Declaration of Independence, that the value of imports in Virginia was.....\$4,255,000
Those of N. York..... 945,000
That in 1832, sixty-three years afterwards, and three years after the last Virginia Convention, her imports were.....\$1,213,000
And New York had gone up to.....\$7,000,000
That the total tonnage of Virginia in 1791, was..... 33,000
And in 1838, had gone down to... 7,000
And New York had gone up to... 500,000 tons

Why was this, he asked? What natural advantage had New York over Virginia? None whatever. The latter had the climate, soil, production, position, and the prestige of the early commerce. He said that Massachusetts and Vermont both added to New York, would not make it as large as Virginia. He said in 1790, the white population of Virginia was 256,000 larger than that of New York; that from that time to 1840, Virginia did not double her population, while New York increased hers eight times—bringing it from 240,000 to 2,480,000.

That Virginia started in Congress with 10 Representatives, and New York with 6; now Virginia has 15, and New York 34.

In that time, Virginia has made about 375 miles of railroad, and 180 miles of canal; and New York 1200 miles of railroad, and about 900 of canal.

In 1846, New York exported of domestic produce.....38,000,000
And Virginia..... 3,500,000
New York exported of foreign produce.....\$14,000,000
Virginia..... 1,550
The productive public property of New York is.....\$15,000,000
Of Virginia..... 6,000,000
School Fund of New York is..... 6,500,000
Virginia..... 1,500,000

In 1849, New York paid the General Government for postage, \$700,000, and Virginia paid \$109,000, and New York paid the Government about \$456,000 more than it cost to transport the mail, and Virginia \$56,000 less than the cost. He said New York had expended 50 millions to reach

Erie on various lines—and she and Massachusetts together about 80 millions, and with Pennsylvania 100 millions. He said New York had expended more money to give its inhabitants water to drink, by turning the Croton Run, than the whole public debt of the state—that Massachusetts had expended more money on the one line of the Boston and Albany railroad, than the whole public debt of Virginia, viz: 14 millions.

He said that the part of Virginia, on the south of James river, was nearly twice as large as Massachusetts, yet Massachusetts had 1000 miles of railroad, and we are trying to make one running to the heart of the greatest agricultural district in the state.

When Mr. T. came to speak of the causes of our decline, it was then that he made the impression upon his audience. He spoke of the "eternal cry," as he called it, about Presidents, Federal Politics, Tariff and Bank—that we attended to the business of every other government but our own; and the small politicians, whose delight it was to alarm us about taxes—taxes—while they took care to forget the main tax, that swallowed up the rest, viz: the freight tax—he was rich! But I can't tell you half—the ridicule, the sarcasm, the anecdotes, all told, and left us in Amelia with different notion altogether of a subject we have so long neglected.—We have determined to do better, and we commenced by increasing our subscription about \$2,000, which we mean to continue to add to. Mr. Tunstall immediately left for another appointment on the road. God grant him success—for, as the wagoners say, he is a "whole team."

Indiana.

New Railroad Line.—The Rushville Republican of the 16th ult., contains the following important intelligence, in reference to a new route from Louisville to the State line on the Bellefontaine road.—The editor says:

Our citizens were taken somewhat by surprise last week by the appearance of a corps of engineers engaged in locating a railroad from Columbus to Union, on the line of the Bellefontaine railroad.—It is an extension of the Jeffersonville and Columbus railroad, and it will constitute, when completed, one of the most important lines of railway in the State. The work appears to be under the control of Louisville, and as the engineers say the company has plenty of money to push the work right through, the liberality and enterprise of Louisville contrast very favorably with that displayed by Cincinnati in her policy toward this section of country. We understand that the company estimate that there are on an average, at least one thousand passengers passing up the Ohio river daily, and that at least three hundred of them desire to go east, and that number would travel over their railroad. The line of road as surveyed passes through the western and northern portions of our town.

Lawrenceburg Railroad.—The board of directors of the Lawrenceburg and Upper Mississippi railroad company met at Greensburg on the first of last week, and re-elected George. H. Dunn, president. The Indiana Register says:

Lettings were made at this meeting of the grubbing and clearing on 15 miles, and the grading and masonry of 7 miles of road. Favorable bids were offered and accepted for the residue of the work to Shelbyville; but the board postponed closing the contracts for a week or two, to afford the citizens on that end of the line an opportunity to make up the amount of stock which is required to justify the letting. Satisfactory assurances were given, that the small amount lacking will be immediately obtained, and the work undertaken this fall.

These contracts will complete the line from the river to Milford, 49 miles in the direction to Columbus and Edinburg; and to Shelbyville, 63 miles in the direction to Indianapolis, with the exception of a few light sections east of Greensburg, for which favorable bids were not made, but which can be readily completed next season before the heavier jobs now under way. All the work let on this occasion is to be completed—the grubbing and clearing this season, and the grading by the 1st of December, 1851.

New York.

Erie Railroad Receipts for October.

Passengers and mail.....\$88,861 59
Freight.....71,718 32

Total.....\$160,579 91
October, 1849.....100,720 51

Increase.....\$59,859 40

The above receipts show an accession of ten thousand dollars in September. The traffic of this road for the year thus far has been as follows:—

1849.	1850.
January.....\$39,340 98	January...\$112,955 22
February....43,505 29	February..102,212 91
March.....50,073 07	March.....130,578 68
April.....62,123 24	April.....141,984 89
May.....66,066 67	May.....148,226 55
June.....60,320 02	June.....120,324 42
July.....57,546 63	July.....104,053 22
August.....70,024 66	August.....129,206 12
September...77,688 45	September.150,017 57

Total....\$526,688 94 Total...\$1,139,559 58
October....100,720 51 October...160,579 91

Total....\$627,409 45 Total...\$1,300,139 49
Increase, 110 p. cent.....\$672,721 04

Should the receipts of November and December show only the same increase as the above ten months, the aggregate receipts of the year will be seventeen hundred thousand dollars, an excess of one hundred thousand over the estimates of the managers.

Virginia.

A meeting of the citizens of Richmond was held on the 19th ult. for the purpose of taking into consideration the subject of aiding the Virginia and Tennessee railroad in the effort now making to raise sufficient means to carry the road from Salem to Wytheville. The meeting was called to order by D. H. London, Esq., on whose motion General Benard Peyton was appointed Chairman, and R. H. Gallagher Secretary.

The meeting was addressed by Col. Garnett, Chief Engineer of the road, Jas. R. Anderson, Esq., and Col. B. R. Floyd, of Wytheville. After which Wm. H. Macfarland, Esq., offered the following resolution, which, after being discussed by Messrs. Macfarland, Lyons, Gen. Harvie, Denoon, and Judge Mason, was amended and adopted by the meeting:

Resolved, That the interest of Richmond in the completion of the Virginia and Tennessee railroad is such that her citizens ought to aid in its construction, and that a subscription thereto of \$100,000 should be made whenever an additional subscription of a like amount has been made by the people of Southwest, and an assurance be given by the company that it will not consent to any discrimination against the city in the transportation below Lynchburg, and that it will facilitate a connection between its road and that of the Richmond and Danville company.

The meeting was also addressed by a number of other gentlemen. Its principal object was to approve and ratify the pledges given by the delegates from Richmond to the Wytheville convention, promising a subscription of \$100,000 from that city in the event that sufficient means could be obtained from other sources, to carry the road to Wytheville.

Richmond proposes to connect with the Virginia and Tennessee railroad by means of the Richmond and Danville, and the South Side railroads, the latter running from Petersburg to Lynchburg in a very direct line, forming a junction with the Richmond and Danville at Burke's. These two

lines will open direct communication between Richmond and the Virginia and Tennessee railroad, which is now properly regarded as the great public work of Virginia.

The Troy and Greenfield railroad, from Greenfield to Shelburne Falls, and from the State-line to Hoosack Mountains, is under contract. Active operations on both these portions will be commenced in a few days. This road is one of great importance to Western Massachusetts and Southern Vermont, and is bound to go through in a very short time.

CHESTER C. H., S. C., 20TH OCT., 1850.

Sir:—I send you enclosed ten dollars, to pay for my subscription to the Railroad Journal. I wish the paper discontinued for the following reasons: first, because the Journal is made the vehicle for disseminating doctrines which strike at the prosperity of the "let alone" States; and secondly, because you seem to think that the discontent which is now universally prevalent all over the south, is not founded on any good reason, but arises solely from the isolated and secluded life of the planter.

We have iron works in South Carolina, rolling mills, nail factories, etc., all of which, when prudence and economy is used, do very well. One, which was managed by men who knew nothing about the business, failed under the tariff of 1842, and having passed into new hands, is doing very well under the tariff of 1846.

A majority of you northern people, and perhaps all of you, seem to think that the southern people are good for nothing but pack horses for you to ride.

Are you not the only people in the world who find fault with a government, not because it imposes taxes too high, but too low. Increase the taxes is the cry with you from January to January. We suspect that your sagacity has discovered that these taxes fall on us, and not on yourselves. You tell us to go to manufacturing; we might as well, and with the same propriety, tell you to go to cotton planting.

Let me ask you seriously, sir, what do the southern people ask of their government? To be let alone in their pursuits, and to be permitted to enjoy their property in peace. Avarice will not permit you to do the former, and fanaticism cannot tolerate the latter.

Let us suppose that the south was immersed instantaneously in one vast sea, what would be the effect on the north? What would become of your carrying trade? your vast shipping interests?—What would the cotton manufacturers do for the raw material?

Will you tell me why you make war upon us? In what particular have we trespassed on you?—Do you think we are cowards? Did you ever know a nation of slave-holders cowards?

You must think we are cowards, or you would never have tolerated such men as Seward, Winthrop, et id omni genus.

In twelve months from this time you will have learned that your madness has dried up the fountains of your prosperity.

We have told you to let us alone and do us justice, this you have failed purposely to do, I for one shall pay you tribute no more.

Respectfully yours,

SAM'L M'ALILEY.

H. V. POOR, Esq., New York.

If we have been guilty of injustice to the south, or to any section of the country, in anything that

our Journal has contained, we are very sorry, and have offended unintentionally. We wish the writer of the above had pointed out where or when we said anything calculated to injure either the interests or feelings of any section. If it should prove that we have been censurable, we are ready to make amends. Such "proofs" cited from our paper would have saved us the necessity of any reply, as we want no better vindication of our conduct than what we have already written. To make charges is very easy, and to prove them is quite a different affair.

It is curious that the article to which the gentleman alludes was suggested to our mind by a conversation with Mr. DeBow, the Editor of the Southern and Western Review, a gentleman well known to the country through his very able journal, and than whom, no one is more ardently attached to the south and its institutions, and who devotes a greater part of his excellent work to the promotion of its interests. The general drift of the article we know met his approbation. The article proceeded upon the self-evident proposition that numbers claimed to exert an influence by virtue of numbers. That numbers had a certain prerogative to enact laws to suit the majority, where the right of the minority might not be invaded, although they might be more favorable to one section than another; such as the location of public works, navy yards, etc., and that such legislation must be expected, and was no sufficient ground for complaint, so long as the weaker party had it in its power to restore the equilibrium, by pursuing the same policy that gave the preponderance to the other party. Now we cannot see any heretical or wrong here. We did not apologize for any wrong that majorities might do. Now the north grows in numbers by developing her mineral wealth as well as her agricultural resources, by making the best use she could of her water power and commercial advantages. In all these elements of wealth the south is as well off as the north, and ever since our connection with the Journal, our great effort has been to call the attention of that section to the importance of turning her attention to a variety of pursuits, not only for the purpose of adding to her wealth, but for the purpose of preserving her political importance. We have always been happy to record every step in her progress, the building of every new cotton mill, the establishment of iron manufactories, every new branch of industry of any kind; in fact, to extend every encouragement and aid within the compass of our means to promote her best good. In this our paper has acted in concert with the best journals in that section, and with the opinions of her most enlightened citizens—who, as far as we have been able to ascertain, have universally approved of our course, with the above exception. Instead of advocating a policy which strikes at the prosperity of the "let alone" States, we advocate only what they themselves admit is vital to their prosperity. Look at Virginia. Read the speech of Mr. Tinstall, in the present number of our paper. Read the report of almost every railroad company at the south, and you will see that the great argument in favor of the construction of these works, is the influence they will exert in building up the States through which they run, in turning all their means of wealth to account, in inviting her population, in creating manufacturing establishments, in building up commercial cities, which may receive and retain the wealth of their people, instead of allowing it to flow north, as it does at the present time. Read the message of the

Governor of Virginia, who is presumed to speak for the State, and see what is the policy there.—How does this great commonwealth propose to cut herself off from bondage to the north? Not by non-intercourse, but by making herself independent by her own industry. She proposes to make Norfolk the great commercial depot of the State in place of Baltimore, Philadelphia, or New York. She proposes to make her own iron, salt, and clothing; in fact everything she wants to use, instead of importing them; and, as the first step towards this new state of things, she is opening roads, so that her people can get at her wealth and transport it to a market. A similar policy, and similar views, are witnessed in Alabama, Georgia, and in fact are becoming prevalent through the whole south. In advocating what the south herself advocates is making war upon her, we do not know which is the pacific path.

With regard to the charges that we consider the southern people as pack horses, cowards, etc., etc., we do not reply to such. Assertions like these are only made by those people who make such charges. They are like all these charges of bad faith, where the wrong intention exists only in the mind making them. We do not believe that as a body there is much difference between the people of the different sections of the Union. The north feels as friendly to the south as does the south to the north, and neither entertain any such sentiments as are attributed to this section of the Union. This feeling of mutual kindness and mutual dependency, we are satisfied will keep the fountains of prosperity of all sections full and overflowing; notwithstanding all the predictions of our croaking friend.

AMERICAN RAILROAD JOURNAL.

Saturday, November 3, 1850.

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Influence of Railroads upon Civilization.

From the earliest date the progress of the race has been measured by the extent to which it has enjoyed the means of travel and intercourse. The isolated man is always a savage. Give him the means and opportunity of mingling among his fellow men, and he emerges at once from barbarism into a civilised state. Every race, and every variety of our race, has its peculiar ideas and characteristics, which become the common stock of each individual who possesses the means of acquainting himself with the various classes which make up the aggregate of the human family. Intercourse stimulates the mind to renewed activity. Association forces man to make use of his inventive faculties, for the purpose of providing for his wants, which were formerly supplied by the bounties of nature; and combination gives the requisite force to carry out his plans of progress and improvement. Association, too, requires the construction of a new code of laws for the regulation of its members; and this calls into exercise his highest intellectual and moral qualities; as the question arises at every step, how far his own actions may interfere with the right of his neighbor; for society is only compatible by a mutual abridgement, to a certain extent, of our own natural rights. Social intercourse, too, by furnishing the objects of its action, is the only condition which can develop to its fullest extent the moral nature of man; the only one that can call into exercise those courtesies and kind offices which constitute the charm, and the chief value of life.

These are truths which are universally recognised. The most celebrated nations of antiquity were those who were the most distinguished for the extent and excellence of their roads, or for their commercial enterprise. The magnificent public ways of the Romans excite our admiration no less than their system of laws, and their military prowess. The remarkable tolerance of opinion upon almost all matters, allowed by that State towards its subjects, was chiefly the result of the means of intercourse enjoyed. Progress in ideas, in the arts, and in civil liberty, keeps exact pace with our progress in locomotion. Commercial pursuits beget and foster a love of liberty, and by the property which they amass, enable its possessors to defend their freedom. The commercial nations of the past alone, have left anything valuable in ideas or the arts of life. So in modern times, we owe the present condition of society, to the commercial towns of Europe, which kept alive the spirit of liberty, when all the remains of ancient civilisation and art had been swept away, and the darkness of the night settled upon those nations which were once the light of the world. But from the resistance which these towns opposed to the spirit of rapine and fanaticism, it is difficult to see how modern society could ever have emerged from the barbarism of the middle ages.

Another potent influence in the regeneration of Europe were the crusades. These, though prompted by the wildest fanaticism, and though complete failures as far as their objects were concerned, are now regarded as one of the great causes which gave a new impulse to the public mind of Europe, by associating together its different nations, making the ideas and experience of all the common stock of each, and by the means thus afforded of transferring to the West the manners, customs, learning, refinement and science of the East. Motion, in fact, is the necessary condition of all growth, as much in the intellectual as the material world. In the lat-

ter it is the result of motion applied to matter. In the former of motion bringing matter in contact with mind.

It is through the medium of these acknowledged truths that we are accustomed to regard the progress of the past. If social intercourse and means of communication have been the great agents of past growth, how stands it with the present generation? With what pace are we moving forward compared with the slow and toilsome progress of our ancestors? From the creation of the world to the present generation, but little progress had been made in the speed of travelling; the agents being the same—animals of one kind or another. The Arab of 3,000 years ago moved as rapidly as the swiftest courier in the campaigns of Napoleon.—The improvements of the past consisted chiefly in providing means by which men could move in masses. But no higher power was brought into action. Muscular power was the greatest available force known to man; and one generation differed from the preceding only in the degree in which this could be advantageously used.

Modern science has discovered and applied to use new forces. These cannot be compared with muscular power, because they are different in kind, and unlimited in extent. They are natural laws pervading the universe. These enable us to move with a rapidity exceeding the flight of the swiftest bird. A man may now traverse an empire in a day. Within the compass of twenty-four hours the fruits of the tropics and high latitudes are brought to the same market. All this is accomplished at a cost, as far below the expense of transportation and travel by the old system, as the former is superior to the latter in rapidity and ease of transit. By means of these new agents a man is destined to be neighbor to every other man on the face of the globe, and in results all varieties of climate are blended into one, in the uniform distribution to all of the products of each.

If our progress is to keep pace with our means of progress, if the effect is to be equal to the cause, we are now commencing a new era in the history of our race. A new revelation has been vouchsafed to man. He is no longer a sport of natural laws. The lightning, instead of being simply an object of terror, is now to him a faculty of omnipresence. The property of elasticity of the gases supplies his motive power. Providence has, to a certain extent, allowed us the use of natural laws in the economy of life; and the historian of the future will make the commencement of the 19th century as the grand line of demarcation between the old and the new, between the condition of society during that period in which the highest available force used was muscular power, and that condition which is to be the result of those now brought into action.

Ohio and Pennsylvania Railroad.

This company has recently paid a high complement to some of the Massachusetts locomotive works, by ordering from them a number of first class engines, with all the latest improvements, and adapted for the highest rates of speed. For Pennsylvanians to order their locomotives from the north is something out of the common course, tho' it does not prove that equally good ones may not be manufactured in that State. It certainly shows that they make good work in Massachusetts.

We are happy to state that the above road is making most rapid progress under the direction of its President and Engineer, whose able and judi-

cious management has secured to the company a high credit, which has enabled it to negotiate its securities at very favorable rates, thus providing ample means for the progress of the work.

PENNSYLVANIA COPPER AND LEAD.

It is reported that an extensive copper and lead formation has been discovered in Pennsylvania, near the Schuylkill river, and only about 20 miles of Philadelphia; and the extent of the metal is from present appearances, such as to warrant the expectation of a very large business arising out of it. Some of the veins have been successfully worked during the past year. The copper ore is said to bear a striking resemblance to that of the Cornwall and Cuba mines. The average yield of 2000 tons has been 20 per cent. of pure copper. The lead and silver ore, which is also abundant, has been assayed and carries about 75 per cent. of lead, and will yield of silver about \$35 to the ton. The Perkiomen mine, which is near the newly discovered veins, has been worked to the depth of about 300 feet, and more than a quarter of a mile in length. Sixty four thousand dollars have already been received for ore, and about 400 tons more have been mined, but not yet sent to market. This, with the new veins, gives evidence of a field of mineral wealth which promises to add to the fame of Pennsylvania as the greatest mineral region in the world.—*Newark Mercury*.

Maryland.

Baltimore and Susquehanna Railroad.—The receipts of this road for the year ending September 30th, were, for tonnage transported over the road—down, 143,424: up, 36,224 tons—total, 199,644 tons. The receipts for the years ending September 30th, in 1849 and 1850, were as follows:

	1849.	1850.
-Passengers.....	\$80,115 78	\$89,823 91
Freight.....	187,777 49	187,772 82
	\$268,893 27	\$277,596 72

Virginia.

Point Pleasant Railroad Meeting.—The citizens of Mason county, Va., and Gallia county, Ohio, held a mass convention at Point Pleasant on the 2d ult., for the purpose of taking into consideration the extension of the Virginia Central railroad, from Covington, Virginia, to the Ohio river, by way of Charleston and the valley of the Great Kanawha.

The meeting was most numerously attended and a subscription of \$50,000 on the part of the citizens of Mason county was authorized, almost by acclamation, on condition that Point Pleasant should be the terminus of the road on the Ohio.

The Virginia legislature, at its last session, authorized the Board of Public Works to employ a competent engineer to survey and report to the board, the nearest and most practicable route from Covington to the Ohio river. In pursuance of this authority the board have employed a distinguished engineer who is at present making a survey of the Green and New rivers. The distance from Charleston to the Point, by way of the Valley is 53 miles, with good grades; and to Guyandotte 48 miles; but seeking a good route to the latter point, it is said the distance will be materially increased.

At the last session of the Ohio legislature, a company was incorporated for the construction of a railroad from Gallipolis, four miles below Point Pleasant, through Jackson to Chillicothe, a distance of 61 miles. This route has been surveyed and found to be entirely practicable; and will be completed as soon as the road to Point Pleasant—thus opening a direct communication between Cincinnati, Sandusky, and every Atlantic city of the Union.

The citizens of Point Pleasant gave a public din-

ner in the Court House square, to the delegates convened, and gave earnest, by their liberal and spirited efforts, at length to pursue their true policy in reference to this great improvement.—*Marshall Beacon*.

Alabama.

Southern Railroad.—A meeting was held at Union Town, Perry county, on the 15th inst., to receive the report of the delegates to the Livingston Convention, when stock was taken to the amount of \$35,000. A gentleman of Union Town informs us that since the date of the meeting, the subscriptions have reached \$50,000 and that the planters of that vicinity will certainly increase the amount to \$100,000.—*Selma Reporter*.

RAILROAD SOLD.

The Hagerstown People's Own says that the part of the Franklin railroad, extending from Chambersburg to the Maryland line, was sold on Friday last to Mr. J. N. Hutchinson for the sum of \$17,500. Mr. H. is the agent of a company in New York, for whom the road has been purchased.

Commerce of the Mississippi.—The diversion of trade from New Orleans, in consequence of the progress of internal improvements in the neighboring states, particularly by the recent extension of the railroad system in Georgia and South Carolina, and its prospective extension into the heart of North Alabama and Tennessee, is beginning to attract attention. The Mayor of New Orleans, in his late message, devotes considerable space to the subject. It is apprehended that the completion of the Charleston and Memphis railroad, the Mobile and Ohio road, and other kindred improvements will, in the course of a few years, materially augment this diversion.

Michigan Southern R. R. Co. \$400,000 SEVEN PER CENT. MORTGAGE LOAN.

SEALED PROPOSALS for four hundred thousand dollars of the first and only mortgage bonds of the Michigan Southern Railroad Company, bearing seven per cent. interest, will be received until the 15th day of November next.

These bonds are issued under the provisions of a special act of the Legislature of Michigan, authorizing the Company to dispose of or sell their obligations either within or without that State, at such rates or prices as may be agreed upon, and if sold below par, to be as binding as if sold at par.

They are secured by a mortgage executed to Shepherd Knapp, Esq., of the city of New York in trust for the bondholders.

This mortgage covers the entire line of the company's road in Michigan, whether already built or hereafter to be constructed, and it provides that bonds to an amount not exceeding one million of dollars in all may be issued; of which amount not more than \$400,000 can be issued until after the road shall have been completed to Sturges' Prairie, a distance of 117 miles from Lake Erie, to which point it will be completed by the first day of January next.

The security offered for the bonds is therefore a mortgage lien, and substantially the only lien, upon a road which, when completed to the State line of Indiana, will have nearly 140 miles of main line, besides a branch of 10 miles, and which will have cost, including the original outlay by the State, and the relaying the present track, about \$2,500,000; of which \$1,500,000 will be represented by stock.

The portion of the road already in operation, about 70 miles, yields an income ample to protect the entire debt proposed to be created, and the length of completed line and consequent increase of revenue, is daily increasing, affording a security which will place the payment of the debt beyond all contingencies.

For August, 1850, the earnings were \$16,417 27. For September, \$20,480. These receipts were derived from the road in its present unfinished condition. Fifty miles of completed road will be added to it within three months, and will be extended to the St. Joseph's river, at the Indiana State line, early next Spring, thus doubling the length of the main line now in operation.

This road is a part of a continuous line of railroads from the city of New York to the Mississippi river, by way of the Erie railroad and the Lake Shore road, and is an important link in the chain.

Nearly the whole of this great line from New York to the Mississippi river is either completed or in the course of construction.

As the means for the construction of the road ready for the iron are provided for by stock subscribed and being paid in, by regular instalments, and the proceeds of the bonds are mainly required for the purchase of iron heavy H rail and equipments, it is believed that no railroad bonds before the public offer greater inducement for safe investment than those of this company.

The mortgage empowers the Trustees, in case of failure, to pay the principal or interest of the bonds, to take possession of the road and receive its earnings, or to sell it, on due notice, and apply the proceeds to the extinguishment of the debt.

The bonds are in sums of \$1,000 each, payable at the Mechanics' Bank, in the city of New York, Nov. 1st, 1860, with interest at seven per cent. per annum, payable semi-annually in New York, on the 1st Nov. and 1st May. Interest warrants or coupons are attached to the bonds.

Four hundred thousand dollars of the bonds are now offered for sale.

Sealed proposals for any amount not less than \$1,000 will be received until the 15th of November next.

Proposals may be addressed to WINSLOW, LANIER & CO., No. 52 Wall street, or to E. C. LITCHFIELD, Treasurer, No. 65 Wall street, endorsed "PROPOSALS FOR MICHIGAN SOUTHERN RAILROAD BONDS."

\$200,000 (half the amount now offered) will be disposed of absolutely and without reserve to the highest bidder. The company reserve the right to withdraw the remainder if the offers are not satisfactory.


All necessary information in relation to the bonds, together with maps, may be obtained by calling on WINSLOW, LANIER & CO. or E. C. LITCHFIELD, at either of which places copies of the bonds and mortgages can be had.

Copies of the bonds and mortgage may also be seen on application to Shepherd Knapp, Esq., President of the Mechanics' Bank, or to James Van Nostrand, Esq., President of the Merchants' Exchange Bank.


Parties whose bids are accepted will be required to pay 25 per cent. upon the amount awarded to them immediately upon being notified of the acceptance of their bids, and the remainder in equal amounts on the 1st and 15th of December next, but any party will be at liberty to pay in full at once. Interest will commence from the day of payment.

New York, October 3d, 1850.

GEORGE BLISS,
CHARLES BUTLER,
JOHN STRIKER,
JOHN B. JERVIS,
EDWIN C. LITCHFIELD,
Committee of Directors.



EMERSON'S
PATENT
CORRESPONDING
VENTILATORS,



For Ships, Steamers, etc.,
Manufactured by
CHILSON, ALLEN, WALKER & CO.,
351 Broadway, New York.

To Civil Engineers.

WANTED—A Practical Engineer, to be concerned in an Enterprise (a valuable Canal Coal Mine) that will prove of great advantage to him, as well as those to be associated with him. A preference will be given to one possessing some means, to aid in the completion of the works now in progress, and to take an interest in the stock of the company, already incorporated. Communications addressed to B.G.L. at this office, with real name and address, will meet with immediate attention.

October 3, 1850

4140

NOTICE

For Proposals for Railroad Iron, for the Alabama and Tennessee River Railroad,

TO BE MANUFACTURED FROM ALABAMA ORE.

THE Alabama and Tennessee River Railroad Co. invite proposals, until the 1st of January, 1851, for Iron Rails, to be made of Alabama Iron, for the Northern Division and part of the Southern Division of their road, embracing a distance of about 105 miles. The rails are to be of the H pattern, in lengths of 18 feet, and weighing 63 lbs. per lineal yard. They are to be delivered on the Coosa river, at a landing to be hereafter designated, between Kimulgee ferry and Fort Williams, commencing their delivery on the 1st of November, 1851, and continuing it at the rate of from 80 to 100 tons per week, until the whole quantity required (10,500 tons) shall have been delivered. They are to be inspected by Lewis Troost, Chief Engineer.

It is proper to state to iron masters and capitalists at a distance, that the country traversed by the Northern and part of the Southern divisions of the road abounds in excellent iron ore and bituminous coal, and possesses every advantage for the successful manufacture of iron, health, cheap labor and provisions.

Further information may be obtained by addressing the President of the Company at Selma, Ala.

By order of the Board of Directors,

J. W. LAPSLEY, President.

STATE OF NEW YORK.

SECRETARY'S OFFICE, ALBANY, AUGUST 15, 1850.—To the Sheriff of the City and County of New York:—Sir, Notice is hereby given that at the General Election to be held in this State on the Tuesday succeeding the first Monday of November next, the following officers are to be elected, to wit:—A Governor in the place of Hamilton Fish; a Lieutenant Governor in place of George W. Patterson; a Canal Commissioner in place of Jacob Hinds; an Inspector of State Prisons in place of David D. Spencer; a Clerk of the Court of Appeals in place of Charles S. Benton; a Representative in the 32 Congress of the United States, for the 3d, 4th, 5th and 6th Districts, in place of J. Phillips Peckenix, Walter Underhill, George Briggs and James Brooks. County Officers to be elected for said county: sixteen Members of Assembly; a District Attorney in place of John McKeon. All of whose terms of office will expire on the last day of December next. And also a City Judge, in pursuance of charter 206, laws of 1850. [The electors throughout the State are also to vote for or against the repeal of the act entitled "An act establishing Free Schools throughout the State," passed March 26, 1849, and an act entitled "An act to amend the act entitled an act establishing Free Schools throughout the State, passed April 11, 1849.]

Yours respectfully

CHRISTOPHER MORGAN,
Secretary of State.

Sheriff's Office, Aug. 20, 1850.

I hereby certify that that the above is a correct copy of the notice of the General Election to be held on Tuesday succeeding the first Monday of November next, received this day from the Hon. Christopher Morgan, Secretary of State.

THOMAS CARNLEY,

Sheriff of the City and County of N. York.

N. B. All the public newspapers within this county will please publish this notice once in each week until the election, and send in their bills for advertising the same as soon as the election is over, so that they may be laid before the Board of Supervisors and passed for payment.

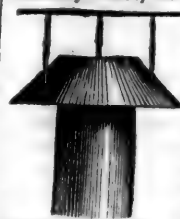
NOTICE.

A MEETING of the Stockholders of the Tonawanda Railroad Company, will be held at the Railroad Hotel, in the village of Attica, in the county of Wyoming, on the 18th day of November next, at 12 o'clock, at noon, for the purpose of passing upon the ratification of an agreement for the consolidation of the Tonawanda Railroad Company and the Attica and Buffalo Railroad Company, into a single corporation, made by the directors of the said two corporations, and to be submitted to said meeting. Dated October 3, 1850.

F. WHITTLESEY, Sec'y.

Emerson's Patent Ventilator,

ADAPTED to Cars, Engine houses, Public Halls, Factories, Churches, School Houses, Dwellings, Chimney Flues, etc.



This Ventilator is stationary, and cannot get out of order. It is constructed in such conformity to certain ascertained laws of pneumatics, as to insure a constant draft outward, whatever may be the changing direction of the wind. The Massachusetts Mechanic Association have awarded a gold medal to the Inventor, and the Manufacturers have already disposed of over 3,000 of the article. Manufactured and sold by
CHILSON, ALLEN, WALKER & Co.,
351 Broadway, New York.

Railroad Iron.

THE Undersigned are prepared to contract for the delivery of superior make Welsh Railroad Iron of the favorite brand "Aberdare."

JOSEPH BRAMWELL & CO.,
91 Wall street.

American Cast Steel.

THE ADIRONDAC STEEL MANUFACTURING CO. is now producing, from American iron, at their works at Jersey City, N.J., Cast Steel of extraordinary quality, and is prepared to supply orders for the same at prices below that of the imported article of like quality. Consumers will find it to their interest to give this a trial. Orders for all sizes of hammered cast steel, directed as above, will meet with prompt attention.

May 28, 1849.

R. R. Instruments for Sale.

A Theodolite & Spirit level by Troughton & Simms. Also Architectural and Engineering Works, together with Drawing Instruments, Plotting Scales, Paper, etc., may be had a bargain, the owner having no further use for them. Apply by letter or personally to R. S. B. 23 Mercer st. 1m*42

To Railroad Companies, Machinists, Car Manufacturers, etc., etc.

CHARLES T. GILBERT,
NO. 80 BROAD ST., NEW YORK,

IS prepared to contract for furnishing at manufacturer's prices—

Railroad iron,
Locomotive Engines,
Passenger and Freight Cars,
Car Wheels and Axles,
Chairs and Spikes.

Orders are invited; and all inquiries in relation to any of the above articles will receive immediate attention

American Railway Guide, AND POCKET COMPANION FOR THE UNITED STATES;

CONTAINING Correct Tables, showing the time for starting of trains from all stations, distances, fares, etc., on all the Railway lines in the U. States; also many of the principal Steamboat and Stage routes—accompanied by a complete RAILWAY MAP. Price, single copies 12½ cts., or \$1 per annum. Published on the first of every month, corrected from returns furnished by the Railway Superintendents throughout the Union.

This book has been compiled somewhat on the plan of Bradshaw's Guide, with such improvements in size, form and arrangement as have seemed desirable; and the publisher confidently hopes it will not be found liable to the objections of incompleteness and incorrectness, which have been made, and justly too, against various other similar works heretofore issued.

The subscriber having had the management of the NEW YORK PATHFINDER almost from its commencement, has enjoyed superior facilities in obtaining information relating to the thoroughfares of travel, and is therefore well qualified to prosecute with success the arduous undertaking of furnishing a complete and correct national guide book.

STRINGER & TOWNSEND, General Agents, 222 Broadway: and sold also by Booksellers and Periodical Dealers generally throughout the country; also on all the Railways and Steamboats.

CURRAN DINSMORE, Publisher.

N. Y. Pathfinder Office,
136 Fulton St., New York City.

FOR SALE.

THREE LOCOMOTIVES, Manufactured by M. W. Baldwin, of 10 tons weight, all in complete repair, and now running on the Columbia and Philadelphia Railroad.

For particulars apply to A. L. Roumfort, Supt. of said road, either at Philadelphia, or Parkersburg, Chester county.

A. L. ROUMFORT,
Supt. Motive Power Col. & Philad. R.R.

Bowling Tire Bars.

40 Best Flange Bars	5½x2 inches,	11 feet long.
40 "	5½x2 "	7 feet 8 in. long.
40 " Flat "	6x2 "	11 feet long.
40 "	6x2 "	7 feet 8 in. long.

Now in store and for sale by

RAYMOND & FULLERTON,
45 Cliff street.

Great Work on Bridge Building, etc., etc.

JUST published in medium folio, One Dollar, 75 cts. to subscribers.

PART II of a "THEORETICAL AND PRACTICAL TREATISE ON THE CONSTRUCTION OF BRIDGES IN STONE, IRON AND WOOD," including the Equilibrium of Arches, the mathematical principles of the Oblique Arch, Suspension Arch, etc., Construction of Foundations in Water, Centering, Oblique Arches, etc., the application of Iron to Railroad Structures, Practical Tunnelling, Suspension Bridges, etc.; illustrated by numerous accurately executed Plans, Elevations, Sections and Details of Stone, Iron and Wood Bridges, Viaducts, Tunnels, Culverts, Machines, etc., constructed by the most eminent Architects and Engineers in Europe and the United States, and numerous Original Designs for Bridges, Viaducts, Culverts, etc. The whole calculated to meet the exigencies of Engineers, and assist Draughtsmen, Bridge Builders, Mechanics and Students. By George Duggan, Architect and Civil Engineer.

The present part contains beautifully executed plans, elevations, sections, and details of the Cast Iron Oblique Arch, 100 feet span, constructed on the system of M. Polonceau, over the Canal St. Denis, Gt. Northern R.R. of France, also plans, elevations, sections and details of a Timber and Iron Truss, 74 feet span, from St. Mary's Viaduct, Cheltenham and Great Western R.R., England, and a Wrought Iron Girder Bridge, 120 feet span, constructed for the London and Blackwall R.R., with the conclusion of the introductory article on the relative merits of the various forms of construction adopted, and materials employed, as regards economy, strength and durability.

Published by George Duggan, 300 Broadway, New York, to whom all communications should be addressed and subscriptions forwarded.

Parties remitting Mr. Duggan \$5. and the remainder \$4 when they have been supplied with the first six parts of the "Theoretical and Practical Treatise on Bridge Building, etc.," shall receive it monthly as published. To those making Mr. Duggan a present remittance of \$9, the work will be forwarded post free to any part of the United States.

United States Railroad Guide and Steamboat Journal.

CONTAINING OFFICIAL TIME ADVERTISEMENTS, Tables of Stations, Distances, Fares, Time, etc., with much miscellaneous matter for the travelling public. Price 12 cents a copy. Yearly subscription \$1. Published at 43 Ann street, New York.

TO RAILROAD COMPANIES, CAR MANUFACTURERS, etc.

THE Undersigned hereby gives public notice, that the Commissioner of Patents, pursuant to his decision in relation thereto, on the 8th day of October, 1850, issued to him a Patent for the sole right to manufacture, and exclusive use of the INDIA RUBBER CAR SPRING, on account of priority of invention of said Spring.

F. M. RAY
New York, Oct. 23, 1850.

RAILROAD CAR MANUFACTORY

TRACY & FALES,
GROVE WORKS, HARTFORD, CONN.

Passage, Freight and all descriptions of
RAILROAD CARS,

AS WELL AS

LOCOMOTIVE TENDERS,

Made to order promptly.

The above is the Largest Car Factory in the Union. In quality of Material, and in Workmanship, Beauty and Good Taste, as well as Strength and Durability, we are determined our work shall be unsurpassed.

JOHN R. TRACY. THOS. J. FALES.

Great American Engineering

AND MECHANICAL WORK, just published in medium folio One Dollar, 75 cts. to Subscribers. Part VIII of "Specimens of the Stone, Iron & Wood Bridges, Viaducts, Tunnels, Culverts, &c., &c., of the United States Railroads." By George Duggan, Architect and Civil Engineer.

The present part contains beautifully executed plans, elevations, sections and isometrical views of the fine Timber Bridge, two arches, 150 feet span, across the Patapsco River, on the line of the Baltimore and Ohio R.R. Also Plans, Elevations and Sections of the Viaduct under the Erie Canal at Lodi, and Culverts of 4 feet chord on the line of the Utica and Syracuse R.R., with the Specifications, Estimates, form of Contract, etc., for the Hartford and N. Haven R.R. Extension.

Published by **GEORGE DUGGAN,**
300 Broadway, New York.

To whom all communications should be addressed, and subscriptions forwarded.

Providence Tool Co.,

MANUFACTURERS OF

Plane Irons, Tooth Irons, Soft Moulding and Rabbit Irons, Cornice Irons, Plow Bits, and Planing Machine Knives:

NUTS, WASHERS AND BOLTS.

—ALSO—

PLATE HINGES AND PICK AXES.

They are prepared to execute orders for all descriptions of Cold Punching and Job Work.

WM. FIELD, Agent. **RUFUS WATERMAN, Treas.**
PROVIDENCE, R. I.

**Ibbotson, Brothers & Co's
CELEBRATED CAST STEEL**

AND

Best Cast Steel Royal Improved Files, well known as better adapted for Engineers' and Machinists' purposes than any now in use in the United States.

Every description of Square, Octagon, Flat and Round Cast Steel, Sheet, Shovel and Railway Spring Steel, etc., and Steel to order for any purposes—manufactured at their works in Sheffield—and universally known by the old stamp "Globe."

HENRY I. IBBOTSON, Agent,
218 Pearl st., New York.

Railroad Iron.

OF ANY PATTERN AND WEIGHT,

Of a Favorite Brand,

And deliverable in Bond, or Duty paid, at any Port of the U. S., contracted for on favorable terms, by

CHARLES ELIUS,
20 Beaver St., New York.

Pig and other Iron also contracted for. Sole Agent for "Baxter's Machine and Burning Oil"—particularly adapted for "Railroads" and other Machinery—Preferred to Sperrin by the many now using it, and 25 per cent. cheaper.

**Faggotted Car and Engine
Axles**

FORGED by **RANSTEAD, DEARBORN & Co.,**
Boston, Mass.

These Axles enjoy the highest reputation for excellence, and are all warranted.

**GRAHAM'S COMPOSITION,
to Remove and Prevent
Incrustation (or Scale) in
STEAM BOILERS.**

THIS valuable composition having been fully and extensively tested, is now offered to the public, as a sure remedy and preventive for incrustations in steam boilers of all descriptions. By its use, all scale is entirely removed from the boilers of Ocean and River Steamers, Locomotive and Stationary Engines, in from 3 to 20 running days, according to the size of the boiler and thickness of the scale. In New Boilers, all incrustation is prevented at a trifling expense.

The preservation of the boiler, great economy of fuel and labor, safety, and increased speed, are among the advantages to be derived from the use of this composition.

Orders should state the quality of water used, viz: "Salt," "Fresh," or "Brackish."

For sale, with directions for use, by
W. H. NEWMAN,
75 Pearl street,
New York.

TESTIMONIALS.

New York, August 17, 1850.

We have used Graham's Composition in the boilers of the Steamship Southerner, during several voyages between this place and Charleston. The boilers were old and very foul with scale, a very large quantity of which was removed by the use of the composition, and no new scale was formed.

From our own experience and observation in the use of the article, we are fully satisfied that it will effectually remove the incrustation made by sea water, and also that it will effectually prevent its formation.

We are also satisfied that the use of it will be attended with a great saving of fuel, and that it has no injurious effect upon iron.

DAVID N. MAXON, Engineer,
BERRY, Master,
Steamship Southerner.

Steamship Philadelphia, }
New York, August 27, 1850.

I have used "Graham's Composition for Steam Boilers," in the boilers of Steamship Philadelphia, on the voyage to and from Chagres, and am entirely satisfied that it will remove, dissolve and prevent all scale or incrustation in salt water boilers.

For the preservation of the boiler and economy of fuel and labor, I hereby recommend the employment of this composition in the Boilers of Ocean Steamers.

WM. BISBY,
Chief Engineer.

Novelty Iron Works, }
New York, July 5, 1850.

We have examined the specimen of Graham's Composition for preventing incrustation of steam boilers, and we believe it may be used with perfect safety in reasonable quantities for the purpose intended, as there does not appear to be any agent in the composition calculated to injure the iron.

STILLMAN, ALLEN & CO.

Piermont, May 20, 1850.

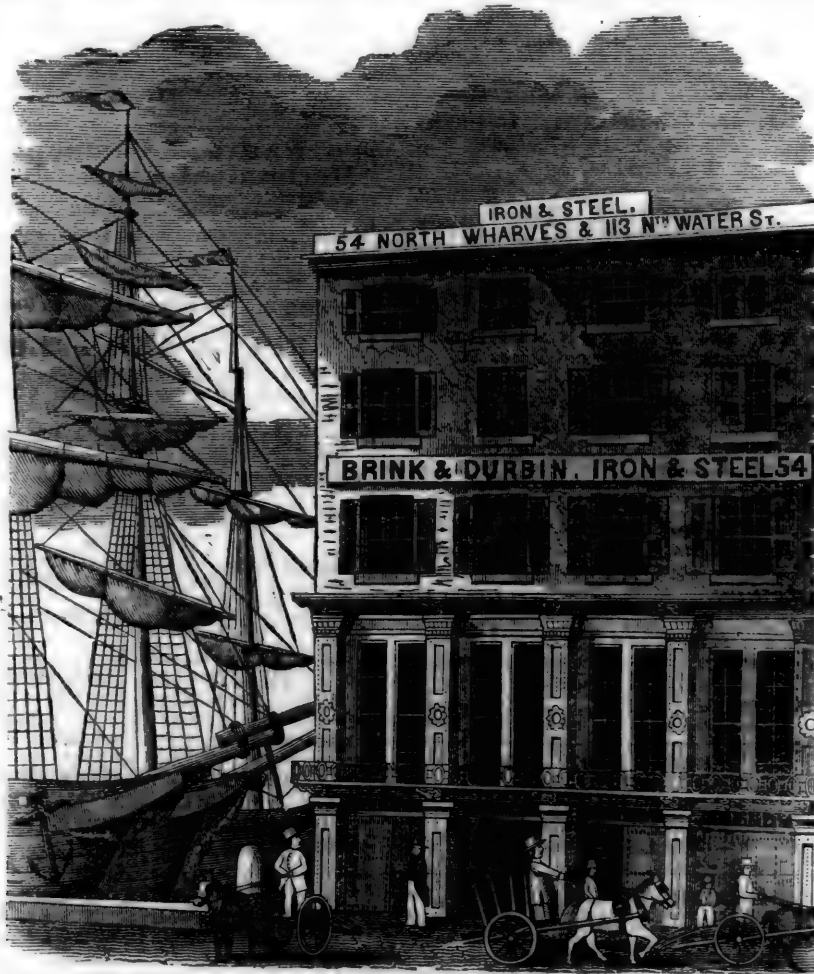
I have used "Graham's Composition," and find it to produce the intended effect; and I hereby, without hesitation, recommend it for Stationary, Marine and Locomotive Engine Boilers.

JOHN BRANDT,
Superintendent Motive Power
New York & Erie R.R.

New York, July 25, 1850.

In answer to many inquiries as to the practical effect of "Graham's Composition," I will state that I have used it in the boiler of the Steamboat Sunwick, which had become considerably incrustated with hard scale from both salt and fresh water. We used 10 lbs. per day, for three days, without blowing off the water, until the fifth day, when all was drawn off. To our astonishment, we found the whole interior of the boiler as clear of scale and smooth as when it came from the hands of the maker. The following week, we tried the same quantity in a small steam tow boat. The boiler had old scale of long accumulation and very thick. We ran the boat three days without blowing off, and on the fourth day washed out the boiler and found it, like the "Sunwick's," perfectly clean and smooth as when new. I am therefore enabled to state that the use of the composition in these two instances under my own immediate observation and direction, has been attended with complete success.

JAMES MORROW,
Engineer Astoria Ferry.

**To Merchants, Railroad Companies, Machinists and Boiler Makers.**

THE subscribers beg leave to call attention to their very large stock of Iron and Steel—of American, English, Swede and Norway make—of all the different kinds in use. Also, Railroad Iron, Ship, Boat and Railroad Spikes. They are also Agents for the Best Pennsylvania Locomotive Boiler and Tank Iron, each sheet of which will be stamped and warranted, at lowest mill prices. Our prices for all kinds of iron will be found very low, either for cash or approved credit.

BRINK & DURBIN, Philadelphia.

ENGINEERS.

Atkinson, T. C.,
Alexandria and Orange Railroad, Alexandria, Va.

Bancks, C. W.,
Civil Engineer, Vicksburg, Miss.

Buckland, George,
Troy and Greenbush Railroad.

Clement, Wm. H.,
Little Miami Railroad, Cincinnati, Ohio.

Cozzens, W. H.,
Engineer and Surveyor, St. Louis, Mo.

Alfred W. Craven,
Chief Engineer Croton Aqueduct, New York.

Davidson, M. O.,
Eckhart Mines, Alleghany Co., Maryland.

Fisk, Charles B.,
Cumberland and Ohio Canal, Washington, D. C.

Felton, S. M.,
Fitchburg Railroad, Boston, Mass.

Floyd-Jones, Charles,
South Oyster Bay, L. I.

Gzowski, Mr.,
St. Lawrence & Atlantic Railroad, Montreal, Canada.

Gilbert, Wm. B.,
Rutland and Burlington Railroad, Rutland, Vt.

Grant, James H.,
Nashville and Chattanooga R. R., Nashville, Tenn.

S. W. Hill,
Mining Engineer and Surveyor, Eagle River,
Lake Superior.

Holcomb, F. P.,
Southwestern Railroad, Macon, Ga.

Johnson, Edwin F.,
New York and Boston Railroad, Middletown Ct.

Latrobe, B. H.,
Baltimore and Ohio Railroad, Baltimore, Md.

Miller, J. F.,
Worcester and Nashua Railroad, Worcester, Mass.

Morris, Elwood,
Schuylkill Navigation, Schuylkill Haven, Pa.

Morton, A. C.,
Atlantic and St. Lawrence Railroad, Portland, Me.

McRae, John,
South Carolina Railroad, Charleston, S. C.

Nott, Samuel,
Lawrence and Manchester Railroad, Boston.

Prichard, M. B.,
East Tennessee and Georgia R. R., Cleveland, Tenn.

Roebbling, John A.,
Trenton, N. J.

W. Milnor Roberts,
Bellefontaine and Indiana Railroad, Marion, Ohio.

Roberts, Solomon W.,
Ohio and Pennsylvania Railroad, Pittsburgh, Pa.

Sanford, C. O.,
South Side Railroad, Virginia.

Schlatter, Charles L.,
Northern Railroad (Ogdensburg), Malone, N. Y.

Sours, Peter,
Rahway, New Jersey.

Stark, George.,
Bost., Con. and Mont. R. R., Meredith Bridge, N. H.

Steele, J. Dutton,
Pottstown, Pa.

Trautwine, John C.,
Panama Railroad—Address through office of Panama
Railroad Co., 78 Broadway, N. Y.

Trimble, Isaac R.,
Philad., Wil. & Baltimore Railroad, Wilmington, Del.

Tinkham, A. W.,
United States Fort, Bucksport, Me.

Thomson, J. Edgar.,
Pennsylvania (Central) Railroad, Philadelphia.

Troost, Lewis,
Alabama and Tennessee Railroad, Selma, Ala.

Whipple, S.,
Civil Engineer and Bridge Builder, Utica, N. Y.

Williams, E. P.,
Auburn and Schenectady Railroad, Auburn, N. Y.

Williams, Charles H.,
Milwaukee, Wisconsin.

HOTELS.

Exchange Hotel,
Adjoining Eastern Railroad Depot,
BUFFALO, N. Y.
BY.....**FISK & SPERRY,**
Late of Delevan House, Albany.

J. D. Abraham, Architect,
NO. 300 MAIN STREET,
BUFFALO, N. Y.

Fountain Hotel,
LIGHT STREET, BALTIMORE,
P. THURSTON.....Proprietor.

DUNLAP'S HOTEL,
On the European Plan,
NO. 135 FULTON STREET,
Between Broadway and Nassau St.,
NEW YORK.

MANSION,
Corner of Maine and Exchange Streets,
P. DORSHIMER. BUFFALO.

GUY'S
United States Hotel,
(Opposite Pratt street Railroad Depot.)
BALTIMORE.
JOHN GUY. WILLIAM GUY.

American Hotel,
Pratt street, opposite the Railroad Depot,
BALTIMORE.
HENRY M. SMITH.....Proprietor.
Late of the Exchange & St. Charles Hotels, Pittsburg.

Washington Hotel,
BY JOHN GILMAN,
\$1 Per Day.
No. 206 Pratt street, (near the Depot.)
BALTIMORE.

Barnum's City Hotel,
MONUMENT SQUARE, BALTIMORE.
This Extensive Establishment, erected expressly
for a Hotel, with every regard to comfort and conven-
ience, is situated in the centre and most fashionable
part of the city, and but a few minutes' walk from the
Railroad Depots and Steamboat Landings.
The House has lately undergone a thorough repair,
embracing many valuable improvements, and will ac-
commodate 250 Guests. **BARNUM & CO.**

JONES' HOTEL,
NO. 152 CHESTNUT STREET,
PHILADELPHIA.
Bridges & Ward, Proprietors.

BUSINESS CARDS.

Lithography.
JOHN P. HALL & CO.,
161 Main st., Buffalo, (Commercial Advertiser Build.)
Are prepared to execute all kinds of Lithography
in good style and at reasonable rates. Particular at-
tention will be paid to Engraving Railroad Maps, En-
gineer's Plans and drafts, etc., and orders in this line
are respectfully solicited.

J. T. Hodge
Will attend to the examination of mining tracts near
Lake Superior, and prepare Reports and Maps.
Address, during the Summer,
[Ontanagon Postoffice, Lake Superior.

Cumberland Steam Coal,

FROM THE
FROSTBURG MINES, MD.

H. A. TUCKER,
Agent of Frostburg Coal Co.
No. 50 Wall Street, New York.

Eaton, Gilbert & Co.,
Railroad Car, Coach and Omnibus Builders,
TROY, N. Y.

Charles T. Jackson, M. D.,
STATE ASSAYER, late Geologist to Maine, Rhode
Island, New Hampshire, and the United States,
offers his services to his friends and the public in mak-
ing any Chemical, Mineralogical or Geological re-
searches that may be required for the improvement of
Agriculture and the Manufacturing Arts. Particular
attention will be paid to the exploration of mines and
to assaying of ores of the metals.
State Assayer's office, 31 Somerset st.
Boston Sept. 3, 1850.

To Railroad Companies and Mechanical Establishments.

A Person of considerable experience and practical
knowledge in Mechanical, Civil and Marine En-
gineering, is anxious to meet with an engagement
with either a Private Individual or Public Company,
who may have works either to design or execute in
the above branches of the Engineering Profession.
Address Z. Y., 47 Atlantic st., South Brooklyn, L.I.

STEEL AND FILES.

R. S. Stenton,
20 CLIFF STREET, NEW YORK,

AGENT FOR
J. & RILEY CARR,
BAILEY-LANE WORKS, SHEFFIELD,
Manufacturers of Cast, Shear, German, Blister, and
Spring Steel,
Of all descriptions, Warranted Good.

FILES.

Manufacturers of Machinists' Warranted Best Cast
Steel Files, expressly for working upon Iron and Steel,
made very heavy for recutting.

A full Stock of Steel and Files at all times on
hand. 6m4

Walter R. Johnson,
CIVIL AND MINING ENGINEER AND AT-
torney for Patents. Office and Laboratory, F St.,
opposite the Patent office, Washington, D. C.

Dudley B. Fuller & Co.,
IRON COMMISSION MERCHANTS,
No. 139 GREENWICH STREET,
NEW YORK.

Manning & Lee,
GENERAL COMMISSION MERCHANTS,
NO. 51 EXCHANGE PLACE,
BALTIMORE.

Agents for Avalon Railroad Iron and Nail Works,
Maryland Mining Company's Cumberland Coal 'CED
—'Potomac' and other good brands of Pig Iron.

Cop Waste.

CLEAN COP WASTE, suitable for cleaning Rail-
road, Steamboat and Stationary Engines, con-
stantly on hand and for sale by
KENNEDY & GELSTON,
57 Pine St., New York.

October 27, 1849,

3m

PLUSHES

FOR

Railway Cars & Omnibuses.**F. S. & S. A. MARTINE,**

112 WILLIAM ST., NEAR JOHN.

ARE now receiving a large and complete assortment of Plain and Figured PLUSHES, of their own importation, which will be sold at the lowest market price, viz: Crimson, Maroon, Scarlet, Green, Blue, Purple, etc.

ALSO—CURLED HAIR, the best manufactured in market.

Samuel Kimber & Co.,
COMMISSION MERCHANTS
WILLOW ST. WHARVES, PHILADELPHIA.

AGENTS for the sale of Charcoal and Anthracite Pig Iron, Hammered Railroad Car and Locomotive Axles, Force Pumps of the most approved construction for Railroad Water Stations and Hydraulic Rams, etc., etc.
July, 27, 1849.

James Herron, Civil Engineer,OF THE UNITED STATES NAVY YARD,
PENSACOLA, FLORIDA.

PATENTEE OF THE

HERRON RAILWAY TRACK.

Models of this Track, on the most improved plans, may be seen at the Engineer's office of the New York and Erie Railroad.

To Railroad Companies.**—WROUGHT IRON WHEELS—**
SAFETY AND ECONOMY.

NORRIS' LOCOMOTIVE WORKS,
SCHENECTADY, NEW YORK,
Are Manufacturing Wrought Iron Driving, Truck, Tender, and Car Wheels—made from the best American Iron. Address **E. S. NORRIS,**
May 16, 1849.

Manufacture of Patent Wire ROPE AND CABLES,

For Inclined Planes, Suspension Bridges, Standing Rigging, Mines, Cranes, Derrick, Tilters, &c., by
JOHN A. ROEBLING, Civil Engineer,
TRENTON, N. J.

Doremus & Harris,ANALYTICAL & CONSULTING CHEMISTS,
179 BROADWAY, NEW YORK.**SCHOOL OF CHEMISTRY.****To Engineers and Surveyors.**

E. BROWN AND SON Mathematical inst. makers No. 27 Fulton Slip, New York, make and keep for sale, Theodolites, Levelling inst., Levelling rods, Surveyors Compasses, and Chains, Cases of Mathematical drawing insts. various qualities, together with a general assortment of Ivory Scales, and small insts. generally used by Engineers.

FORGING.**Ranstead, Dearborn & Co.,**MANUFACTURERS OF
LOCOMOTIVE CRANKS AND CAR AXLES,

ALSO

WROUGHT IRON SHAFTING,
And All Kinds of Hammered Shapes.
Office 25 Foster's Wharf, Boston.

Henry I. Ibbotson,

IMPORTER of Sheffield and Birmingham Goods.
Also, Agent for the Manufacture of Telegraph Wire.
218 PEARL ST., NEW YORK.

Cumberland, (Md.) Coals for Steaming, etc.

ORDERS RECEIVED FOR AND FILLED
by **J. COWLES, 27 Wall St., N. Y.**

Samuel D. Willmott,
MERCHANT, AND MANUFACTURER OF
CAST STEEL WARRANTED SAWS,
—AND FILES—

IMPORTER OF THE
GENUINE WICKESLY GRINDSTONES
NO. 8 LIBERTY STREET,
NEW YORK.

Railroad Instruments.

THEODOLITES, TRANSIT COMPASSES,
and Levels, with Fraunhoffer's Munich Glasses,
Surveyor's Compasses, Chains, Drawing Instruments,
Barometers, etc., all of the best quality and
workmanship, for sale at unusually low prices, by
E. & G. W. BLUNT,
No. 179 Water St., cor. Burling Slip.
New York, May 19, 1849.

IRON.**Car Wheel Iron.**

100 Tons "Columbia" No. 2 Cold Blast Charcoal
Iron.
300 Tons "Sallebury" No. 1, do. do.
For sale by **CHARLES T. GILBERT,**
No. 80 Broad st.
New York, Sept. 21, 1850.

Railroad Spikes.

THE subscribers are prepared to make and execute
contracts for Railroad Spikes of a superior quality,
manufactured by the New Jersey Iron Company,
at Boonton. **DUDLEY B. FULLER & CO.**
139 Greenwich st. corner of Cedar.

Railroad Iron.

FOR SALE—500 Tons of superior flat bar Railroad
Iron, two and a half by three-fourths—which has
been in use on the Cumberland Valley Railroad for
about three years. For terms apply to **Henry J. Bid-
dle, Esq., Philadelphia,** or to **FREDK. WATTS,**
President of the Cum. Val. R.R., Carlisle, Pa.
Carlisle, Sept. 17, 1850.

Railroad Iron.

1650 Tons, weighing about 61 lbs. per yard, 40
tons, weighing about 52 lbs. per yard, and
825 tons, weighing about 53½ lbs. per yard, of the lat-
est and most approved patterns of T rail, for sale by
BOORMAN, JOHNSTON & CO.,
119 Greenwich street.

New York, Aug. 26, 1850.

N.B.—B. J. & Co are also prepared to take con-
tracts for English rails, delivered in any of the Atlan-
tic ports of the United States.

Railroad Iron.

THE Undersigned, Agents for Manufacturers, are
prepared to contract to deliver Rails of superior
quality, and of any size or pattern, to any ports of dis-
charge in the United States.

COLLINS, VOSE & CO.,
74 South St.

New York, June 1, 1850.

Railroad Iron.**1,500** Tons weighing 53 lbs. per lineal yard.

500 " " 57 " "

500 " " 56 " "

500 " " 60 & 61 lbs. "

Also 2½x½ flat rails. All the above being of approv-
ed patterns. For sale by

DAVIS, BROOKS, & CO.,
68 Broad street.

N.B.—Rails imported on commission, or at a fixed
price.

Iron.

Pig Iron, Anthracite and Charcoal; Boiler and Flue
Iron, Spring and Blistered Steel, Nail Rods, Best Re-
fined Bar Iron, Railroad Iron, Car Axles, Nails, Stove
Castings, Cast Iron Pipes of all sizes, Railway Chairs
of approved patterns for sale by
COLEMAN, KELTON & CAMPBELL,
109 N. Water St., Philadelphia.

Railroad Iron.

THE UNDERSIGNED, HAVING made arrange-
ments abroad, are prepared to contract for the de-
livery of Foreign rails, of approved brands upon the
most favorable terms.

They will also make contracts for American rails,
made at their Trenton works, from Andover Iron, in
whole or in part, as may be agreed upon.

They are prepared to furnish Telegraph, Spring and
Market Wire; Braziers and Wire Rods; Rivets and
Merchant Bars to order, all made exclusively from An-
dover Iron. The attention of parties who require iron
of the very best quality for special purposes, is respect-
fully invited.

COOPER & HEWITT,
17 Burling Slip, New York.

February 15, 1850.

Glendon Refined Iron.Round Iron, Band Iron, Hoop Iron,
Square " Flat " Scroll "

Axles, Locomotive Tyres,
Manufactured at the Glendon Mills, East Boston, for
sale by **GEORGE GARDNER & CO.,**
5 Liberty Square, Boston, Mass.
Sept. 15, 1849. 3m37

**PATENT HAMMERED RAILROAD, SHIP &
BOAT SPIKES.**—The Albany Iron Works
have always on hand, of their own manufacture, a
large assortment of Railroad, Ship and Boat Spikes
from 2 to 12 inches in length, and of any form of head
From the excellence of the material always used in
their manufacture, and their very general use for rail
roads and other purposes in this country, the manu-
facturers have no hesitation in warranting them fully
equal to the best spikes in market, both as to quality
and appearance. All orders addressed to the subscrib-
ers at the works will be promptly executed.

JOHN F. WINSLOW, Agent.

Albany Iron and Nail Works, Troy, N. Y.
The above Spikes may be had at factory prices, of
**Erastus Corning & Co Albany; Merritt & Co., New
York; E. Pratt & Brother, Eastmore, Md.**

**LAP—WELDED
WROUGHT IRON TUBES**

FOR

TUBULAR BOILERS,
FROM ONE AND A QUARTER TO SEVEN
INCHES IN DIAMETER.

THE ONLY Tubes of the same quality and man-
ufacture as those so extensively used in England,
Scotland, France and Germany, for Locomotive, Ma-
rine and other Steam Engine Boilers.

THOMAS PROSSER & SON, Patentees,
29 Platt street, New York.**Railroad Iron.**

THE UNDERSIGNED ARE PREPARED TO
contract for the delivery of English Railroad Iron
of favorite brands, during the Spring. They also re-
ceive orders for the importation of Pig, Bar, Sheet, etc.
Iron. **THOMAS B. SANDS & CO.,**
73 New street,
New York.

February 3, 1849.

Iron Store.

THE Subscribers, having the selling agency of the
following named Rolling Mills, viz: Norristown,
Rough and Ready, Kensington, Triadelphia, Potts-
grove and Thorndale, can supply Railroad Companies,
Merchants and others, at the wholesale mill prices for
bars of all sizes, sheets cut to order as large as 58 in-
diameter; Railroad Iron, domestic and foreign; Loco-
motive tire welded to given size; Chairs and Spikes;
Iron for shafting, locomotive and general machinery
purposes; Cast, Shear, Blister and Spring Steel; Boil-
er rivets; Copper; Pig iron, etc., etc.

MORRIS, JONES & CO.,

Iron Merchants,

Schuylkill 7th and Market Sts., Philadelphia.
August 16, 1849. 1y33**Railroad Iron.**

THE MOUNT SAVAGE IRON WORKS, AL-
legany county, Maryland, having recently pass-
ed into the hands of new proprietors, are now prepar-
ed, with increased facilities, to execute orders for any
of the various patterns of Railroad Iron. Commu-
nications addressed to either of the subscribers will have
prompt attention. **J. F. WINSLOW, President**
Troy, N. Y.

ERASTUS CORNING, Albany;
WARREN DELANO, Jr., N. Y.
JOHN M. FORBES, Boston.
ENOCH PRATT, Baltimore, Md

November 6, 1848.

Railroad Iron.

THE SUBSCRIBERS ARE PREPARED TO
take orders for Railroad Iron to be made at their
Phoenix Iron Works, situated on the Schuylkill Riv-
er, near this city, and at their Safe Harbor Iron Works,
situated in Lancaster County, on the Susquehanna
river; which two establishments are now turning out
upwards of 1800 tons of finished rails per month.

Companies desirous of contracting will be promptly
supplied with rails of any required pattern, and of the
very best quality.

REEVES, BUCK & CO.
45 North Water St. Philadelphia

March 15, 1849.

Tredegar Iron Works.

ROLLING MILL FOUNDRY AND MACHINE SHOPS. The undersigned continues to manufacture at his Works in this city (from best charcoal metal) Bar Iron of every description, embracing—Rounds and Squares, from 1½ to 5 inches diameter. Flats, from ½ to 7 inches, all thicknesses. Bands and Scrolls, all sizes. Boiler plate and Plough Iron. Railroad and Locomotive Axles and Tires. Locomotive Frames, Spikes and Plates. Hoops, Ovals, Half Ovals, Half Rounds, Angle, T, L, and indeed every description of Iron usually manufactured, all of which he warrants to be equal to any made in this country. He also manufactures at his Foundry and Machine Shops all descriptions of Railroad Work, say, Locomotives, Railroad Wheels and Axles complete and ready for the road, Railroad Chairs, etc. Also, Marine and Stationary Engines all sizes, Sugar mills and Engines, Horse mills, and every kind of Machinery usually required for the operations of the country. He has paid particular attention to getting up machinery, etc., for Gold Mine operations, and those in want of such work might find it to their advantage to give him a call. **J. R. ANDERSON.**
Richmond, Va., Sept. 10, 1850.

CUT NAILS OF BEST QUALITY, BAR IRON (including Flat Rails) manufactured and for sale by **FISHER, MORGAN & CO.,**
75 N. Water St., Philadelphia.

Iron Wire.

REFINED IRON WIRE OF ALL KINDS, Card, Reed, Cotton-flyer, Annealed, Broom, Buckle, and Spring Wire. Also all kinds of Round, Flat or Oval Wire, best adapted to various machine purposes, annealed and tempered, straightened and cut any length, manufactured and sold by **ICHABOD WASHBURN.**
Worcester, Mass., May 25, 1849.

Wheel, Forge and Foundry Iron.

LOCUST GROVE Wheel Iron of great strength and superior chilling property.
Balt. Charcoal Forge Iron, from Patuxent, Curtis Creek and Gunpowder furnaces.
Elkridge Foundry Iron, of superior strength and softness. Anthracite and Charcoal Iron from Pennsylvania and Virginia. Gas and Water Pipes, Lamp Posts from Elkridge furnace.

LEMMON & GLENN,
6m9 62 Buchanan's Wharf, Baltimore.

S. S. Keyser & Co., IRON WAREHOUSE,

Corner of South and Pratt Streets, BALTIMORE, MD.
Selling Agents for the Rough and Ready Bar Iron and Elk Boiler and Flue Iron Rolling Mills, Sarah and Taylor Furnaces, and Wrightsville Hollow Ware Foundry, and Dealers in Bar and Sheet Iron, and Cast, Sheer, German, Blister, Spring and Electrolyzed Steel, etc., etc.

Smith & Tyson.

GENERAL COMMISSION MERCHANTS,
No. 25 South Charles St., Baltimore, Md.

AGENTS for the Celebrated Columbia Pig Iron, suitable for Car Wheels and Chilled Rolls.
Columbia refined Charcoal Blooms; Refined Charcoal Juniata Billet Iron for Wire; Refined Iron for Bridging, of great strength; Cut Nails, Spikes, and Brads; Railroad Spikes and Wrought Chairs. 22tf

Stickney & Beatty,

DEALERS IN IRON AND IRON MANUFACTURERS.

AGENTS for the Balt. City Rolling Mill, from which establishment they are prepared to furnish Elliott's round, square, and flat bar iron, puddled and charcoal boiler plates and billet iron—also agents for the sale of the Laurel and Maryland (Balt.) charcoal forge pig iron, Balt. hard iron for chilling wheels, anti-rust nails, Catoctin foundry iron, boiler blooms from the Caledonian works, Wm. Jessop & Son's cast steel, Coleman's blister steel and nail rods, hoop, band, sheet, oval and common English iron.
Nos. 18 and 20 South Charles St., Baltimore.

Railroad Iron.

CONTRACTS made by the subscribers, agents for the manufacturers, for the delivery of Railway Iron, at any port in the United States, at fixed prices, and of quality tried and approved for many years, on the oldest railways in this country.
RAYMOND & FULLERTON, 45 Cliff St.

IRONDALE PIG METAL, MANUFACTURED and for sale by the Bloomsburg Railroad Iron Co.
LINDLEY FISHER, Treasurer.
75 N. Water St., Philadelphia.

Railroad Iron.

2000 Tons, weighing 58 pounds per lineal yard, of the most approved pattern of T rails, in store and to arrive, for sale by **COLLINS, VOSE & CO.,**
74 South St.
New York, June 1, 1850.

Railroad Iron.

3,000 TONS C. L. MAKE 63½ lbs. per yard, now landing and to arrive.
Also contracts made for future delivery of above superior make English Iron.
300 Tons Banks Best Iron, Round, Square and Flat.
200 " English Bar " " " "
10 " 9-16 Square Iron for Railroad Spikes.
For sale in lots to suit purchasers by **DAVID W. WETMORE.**
New York, March 26, 1850. 3m

WILLIAM JESSOP & SONS' CELEBRATED CAST-STEEL.

The subscribers have on hand, and are constantly receiving from their manufactory, **PARK WORKS, SHEFFIELD,** Double Refined Cast Steel—square, flat and octagon. Best warranted Cast Steel—square, flat and octagon. Best double and single Shear Steel—warranted. Machinery Steel—round. Best and 2d gy. Sheet Steel—for saws and other purposes. German Steel—flat and square, "W. I. & S." "Eagle" and "Goat" stamps. Genuine "Sykes" L Blister Steel. Best English Blister Steel, etc., etc., etc.
All of which are offered for sale on the most favorable terms by **WM. JESSOP & SONS,**
91 John street, New York.
Also by their Agents—
Curtis & Hand, 47 Commerce street, Philadelphia.
Alex'r Fullerton & Co., 119 Milk street, Boston.
Stickney & Beatty, South Charles street, Baltimore.
May 6, 1848.

JOHNSON, CAMMELL & Co's Celebrated Cast Steel,

AND ENGINEERING AND MACHINE FILES, which for quality and adaptation to mechanical uses, have been proved superior to any in the United States. Every description of square, octagon, flat and round cast steel, sheet, shovel and railway spring steel, best double and single shear steel, German steel, flat and square, goat stamps, etc. Saw and file steel, and steel to order for any purposes, manufactured at their Cyclops Steel Works Sheffield.
JOHNSON, CAMMELL & CO.,
100 William St., New York.
November 23 1849.

Railroad Iron.

THE Undersigned, Agents for Manufacturers, are prepared to contract for the delivery of English, Welsh and Scotch Rails, of any pattern and weight, also for every description of English, Welsh, Scotch, and Swedish Iron, Railway Chairs and Spikes, Rivets, Bolts, Nuts, Washers, Chain Cables, Anchors, Tin Plates, German Spelter, Iron Castings, and every description of Machinery.

WILLIAM BIRD & CO.,
Iron and Tin Plate Merchants,
44 Wall st., New York.
And at 5 Martin's Lane, City, London,
and 140 Buchanan st., Glasgow.

July 27th, 1850.

To the Proprietors of Rolling Mills and Iron Works.

THE Undersigned—Proprietors of Townsend's Furnace and Machine Shop, Albany—are extensively engaged in the manufacture of Machinery and fixtures for Iron, and Copper Rolling Mills, and Iron Works. Having paid particular attention to the manufacture of *Rolls* (Rollers), both *chilled and dry-sand*, they feel confident that they can execute orders for such castings in a satisfactory manner. And to give assurance of this, they beg leave to refer to the following named persons, proprietors and managers of some of the most extensive rolling mills in the country, viz: Jno. F. Winslow, J. Tuckerman, H. Burden, W. Burr, J. & J. Rogers, Saltus & Co., J. B. Bailey, L. G. B. Cannon, Hawkins & Atwater, etc., etc.
F. & T. TOWNSEND.
Albany, August 18, 1849,

Railroad Iron.

B. O. Railway Tires, Railway Wheels,
Scotch Pig Iron, Tin Plates and Banca Tin,
Muntz's Patent Metal Sheathing,
Baltimore Copper.

Contracts for Rails made on behalf of the manufacturers, for delivery at any ports in the United States, at fixed prices.
Bowling Tires and Tire Bars and Scotch Pigs imported to order.
Muntz's Ship-sheathing, and a general stock of Tin Plates and Banca Tin in store, and for sale by **RAYMOND & FULLERTON, 45 Cliff St.**

Bowling Iron. Stamped B.O.

Railway Tire Bars Rivet Iron
Locomotive and other Axles Locomotive Frame do
Boiler Plates Bars,
and every other description of this superior iron.
The subscribers, agents for the sale of Bowling Iron, are prepared to execute orders for importation, especially for railway and machinery uses, with despatch from the manufacturers.
RAYMOND & FULLERTON, 45 Cliff St.

Lovegrove's Patent Cast Iron Water and Gas Pipes.

THE Subscriber, the Inventor and Patentee of the Centrifugal mode of giving form to metallic substances while in a molten state, is preparing to make Cast Iron Water and Gas Pipes, of any dimensions, at prices much lower than they can be made in the old manner, and the pipes warranted to stand a pressure of three hundred pounds to the square inch, and to be soft enough to drill. Steam Engines and all kinds of machinery. Cast Iron Doors and Frames, and Mill Castings of every description, made to order.
THOMAS LOVEGROVE,
Machinist and Founder,
West Falls Avenue, below Pratt St., Baltimore.

Ray's Patent India Rubber Car Springs.

Savannah, Ga., May 22, 1850.
FOWLER M. RAY, Esq.,
Dear Sir: I have no hesitation in saying, after having used on our road your springs and Fuller's, that I consider yours decidedly the best in every particular, and in this opinion I am sustained by all our officers. Fuller's spring has a tendency to split, and also to chafe or abrade by the constant friction on the cast iron plates or disc: and in my opinion is not near so elastic as yours.

Your springs, which have been in use on our road for 12 or 15 months past, and in constant use under both passenger and freight cars, are to all appearances as elastic, sound and good, as when first put in use.
We are now building eighty-five new cars, of which for fifty-sets the springs have been ordered of you.

GEORGE A. ADAMS,
Master Carpenter,
Central Railroad and Banking Co. of Georgia.

Connecticut River Railroad Office, }
Northampton, May 4, 1850. }

E. CRANE, Esq.,
Dear Sir: It is now about two years since I first tried the experiment of using a set of Ray's India-rubber Springs upon one of our merchandise cars, and although the car has been in constant service since that time, I do not on examination find the slightest difference either in the thickness or elasticity of the material.

The same result has followed wherever we have applied them, either for wheel or draw springs on Engines, Tenders or Cars. At present we use no other; either in replacing old springs or building new cars—and I am perfectly satisfied that for economy, durability, safety, and ease of motion, that Ray's India-rubber is the best article for Springs which has been presented to the public.

Yours respectfully, **J. HUNT,**
Supt. Connecticut River Railroad.

EDWARD CRANE, Esq.,
Dear Sir: Having applied to cars of the Boston and Worcester Railroad Corporation, Ray's Vulcanized Rubber Springs (where they have been in use for some two years last past), I have had occasion to observe their operation, and am free to say in answer to your inquiries, that they retain their elasticity perfectly during all changes of atmospheric temperature: and are in my opinion a most valuable acquisition to Railroad Cars—are not liable to derangement, as is the case with steel springs; while at the same time it costs less to apply them. Respectfully yours,

D. N. PICKERING,
Supt. Motive Power, Bost. & Wor. Railroad.
Boston, April, 15th, 1850.

Monument Foundry.

A. & W. DENMEAD & SON,
Corner of North and Monument Sts.,—Baltimore,
HAVING THEIR
IRON FOUNDRY AND MACHINE SHOP
In complete operation, are prepared to execute
faithfully and promptly, orders for
Locomotive or Stationary Steam Engines,
Woolen, Cotton, Flour, Rice, Sugar Grist, or Saw
Mills.
Slide, Hand or Chuck Lathes,
Machinery for cutting all kinds of Gearing.
Hydraulic, Tobacco and other Presses,
Car and Locomotive patent Ring Wheels, war-
ranted,
Bridge and Mill Castings of every description,
Gas and Water Pipes of all sizes, warranted,
Railroad Wheels with best fagotted axle, fur-
nished and fitted up for use, complete
Being provided with Heavy Lathes for Bor-
ing and Turning Screws, Cylinders, etc., we can
furnish them of any pitch, length or pattern.
Old Machinery Renewed or Repaired—and
Estimates for Work in any part of the United States
furnished at short notice.
June 8, 1849.

**RAILROAD CAR
AND COACH TRIMMINGS.**
Doremus & Nixon,
IMPORTERS AND FURNISHERS

HAVE FOR SALE
Plain Garnet Plush. Fig. Garnet Plush (Butterfly pat.
"Crimson " "Crimson " (Elegant.
"Scarlet " " " " (Gen. Taylor.
BROCATELLES.
Crimson Silk Brocatelles. Gold and Maroon do.
Gold and Blue " " Brown "
Silk and Wool " " of every color.
MOQUETTES,
Of elegant designs and colors.
GERMAN CLOTH FOR CAR LININGS.
The most beautiful goods ever shown in this coun-
try, and the subscribers are the sole agents for the sale
of them.
Oil cloths Enamelled with Gold. } These goods can be
" " Silver. } furnished in any
Do. Silver ground velvet printed. } dimensions req'd.
CURLED HAIR
Of every description and quality.
JNO. W. A. STRICKLAND, Agent.
New York, 1850. 1716

**FOWLER M. RAY'S
Patent India-rubber Railroad
CAR SPRING.**

New York and Erie Railroad Shops.
Piermont, March 26, 1850:

This will certify that from practical experience in
the use of Fowler M. Ray's India rubber Car Springs,
I believe them to be far superior to any others now in
use.

I have never known them to be affected by any
change of temperature, as other Rubber Springs have
been affected on this road.

I am at the present time repairing a Passenger Car
that Mr. Ray and myself mounted with his springs
about two years and eight months since.

The springs are at the present time as perfect, to all
appearances, as when first applied to the car.

Respectfully yours,
HORACE B. GARDNER,
Foreman of the Car Shops.

Supt. Office N.Y. & H. R.R., }
New York, March 8, 1850.

This is to certify that we have used the Rubber
Springs manufactured by Mr. F. M. Ray for the past
twenty months, "both for Passenger and Freight Car
Springs and Bumpers, and of different sizes," and
have in every case given entire satisfaction, and I con-
sider them the best spring now in use.

M. SLOAT, Supt.

Boston, March 5, 1850.

In answer to your enquiry about India-rubber
Springs, I have to say that we have used them to a
considerable extent on both freight and passenger cars,
and also on several of our tenders; and I am very
well satisfied that they answer all the purposes for
which they are intended. I believe the India-rubber
will soon supersede all other springs for cars and ten-
ders.
Yours truly, **S. M. FELTON,**
Supt. Fitchburg Railroad.

Office New Jersey Railroad Co., }
Jersey City, March 8, 1850. }

FOWLER M. RAY, Esq.,
Dear Sir: In answer to your enquiries respecting
the operation of the Vulcanised Rubber Springs, pur-
chased by our company from you some two years
since, I reply that they are superior to any spring in
use, (that I have either seen or heard of).

The improved form of your spring, consisting of a
solid piece of vulcanised rubber with bands on the out-
side, is far superior to your first form, consisting of
disks of rubber with metallic plates interposed.

The last named form was tried, if you recollect, at a
much earlier period; and then was replaced by your
last form.

I have no hesitation in saying that your springs
have given entire satisfaction, and most cheerfully re-
commend them to railroad companies throughout the
country for the following reasons:

- 1st. The cost is 30 per cent. less.
- 2d. Saving of weight on each car of 8 wheels from
700 to 900 lbs.
- 3d. Less care and attention is required, as they are
not liable to get out of repair.
- 4th. A great saving is secured in the wear and tear
of the cars and rails from their great elasticity.
- 5th. The freedom from noise.
- 6th. There is greater safety in case of accident, as
they cannot be broken.
- 7th. The comfort of passengers is enhanced suffi-
ciently to pay the expense, waiving all the other rea-
sons that I have given.

Should this fail to satisfy any person enquiring, you
are at liberty to refer to me, No. 150 Washington St.,
Jersey City. Yours respectfully,

T. L. SMITH, Supt.

New York, March 11, 1850.

I have used the Patent India-rubber Spring pur-
chased of Mr. Ray, upon the cars of the New York
and New Haven Railroad, and have found them effi-
cient and economical; and when applied to the axles
and draw springs, believe them to be quite equal to
any in use. I have found a combination of these
springs with a steel spring under the transom beam a
very satisfactory arrangement, and am now using this
plan in all new cars.

Yours respectfully,
ROBERT SCHUYLER.

February 25, 1850.

From practical observation of the use of the India-
rubber Car Springs, manufactured and sold by your
company, we are entirely satisfied in their application,
and do not hesitate to recommend them as elastic, du-
rable, requiring no repairs for years, and retaining
their consistency during all extremes of weather. We
have applied them for the past two years, and consid-
er them superior for all railroad purposes.

Yours truly,

OSGOOD BRADLEY, Car Builder, Worcester.
T. & C. WASON, do. Springfield.
DEAN, PACKARD & MILLS, do. do.
DAVENPORT & BRIDGES, do. Cambridgeport.

Office of the New Jersey Railroad Co., }
Jersey City, March 7, 1850. }

This is to certify that we have had Mr. F. M. Ray's
India-rubber Springs in constant use under our cars,
and as Bumper Springs for upwards of two years, and
they have in every way given perfect satisfaction.

The present form of spring we deem far superior to
the form of Disk, having used both forms, although
we have none of those made in Disks at present in use.

We take pleasure in recommending these springs to
all railroad companies.

J. P. JACKSON, Vice Pres.
New Jersey Railroad and Trans. Co.

Roxbury, February 28, 1850.

In compliance with your request, I take great plea-
sure in stating the result of my experience in the use
of "Ray's Patented Vulcanised India-rubber Car and
Engine Springs." We have used them nearly two
years, and never had one fail in any way. The cold
weather does not affect them, as it has other rubber
springs we have used.

With sixteen years' experience as superintendent of
machinery on the Boston and Providence railroad, I
take pleasure in saying that your springs are the best
we ever used, or I ever saw used elsewhere. We have
20 cars rigged with them, of which I can say that the
springs are as good now as when first applied. I put
24 lbs. of the rubber under the forward end of one of
our heaviest engines, taking off 250 lbs. of steel springs
—it has been in use 18 months, and is in as good con-
dition now as when first put under the engine.

Very respectfully yours,

GEO. S. GRIGGS,
Supt. of Machinery, Boston and Prov. R.R.

Fall River, February 2, 1850.

In answer to yours of the 20th ult. I would say that
this company has for some 10 or 12 months past been
using "Ray's India-rubber Springs." We have ap-
plied them to both passenger and freight cars with
uniform success. They have invariably preserved
their elasticity and consistency through all the ex-
tremes of weather; and we are now applying them
whenever the steel spring fails. I am well satisfied
that they are particularly adapted for railroad purposes.

Very respectfully yours,

GEO. HAVEN,
Supt. Fall River Railroad.

Jersey City, March 9, 1850.

This is to certify that the present form of Mr. F.
M. Ray's India-rubber Car Spring I consider far su-
perior to the form of Disk, having used both forms.

I take pleasure in recommending these springs to all
railroad companies. **DAVID H. BAKER,**
Foreman of Car Shop of N.J. R.R. & Trans. Co.

Harlem R.R. Depot, }
New York, March 7, 1850. }

This is to certify that we have used Mr. F. M. Ray's
India-rubber Springs for over eighteen months, and
find them to be easy and durable, and recommend them
to railroad companies as being superior to anything we
have tried.

J. M. SMART,
Foreman at 42d St. Depot.

Old Colony Railroad Office,
Boston, March 6, 1850.

EDWARD CRANE, Esq.,

President New England Car Co.,

Dear Sir: In compliance with your request I would
state that the Old Colony Railroad Company have had
in use upon their road, India-rubber Springs furnish-
ed by your company, for more than eighteen months
past, during which time they have been extensively
used under Passenger and Freight Cars, Locomotive
Tenders, and for Drawer and Buffing Springs, with
the most perfect success. The elasticity and consis-
tency of the Rubber has never been unfavorably affect-
ed by either extremes of heat or cold—and from the
experience which we have had in the use of Rubber
Springs, I think them well adapted for railroad pur-
poses—and therefore we have for some months past
used Rubber almost exclusively, in all places where
springs are required.

Respectfully yours, etc.,

JAS. H. MOORE,
Supt. O. C. Road.

Troy, February 27, 1850.

We have been using your India-rubber Car Springs
for nearly two years—and we take pleasure in saying
that in our opinion the rubber has to a certain extent
already, and may eventually entirely supersede all
other Springs for Railroad Car purposes. We now
use it entirely for Draw Springs and Bumpers, con-
sidering it better and lighter than steel.

During our two years' experience in the use of it,
we have not known any to lose their elasticity, or fall
in any way; and we cheerfully recommend the rub-
ber for railroad car springs. Very respectfully,

EATON, GILBERT & CO.

Passenger Car Linings.

THE Advertiser continues to make to order the
Enamelled Car Linings which have been so high-
ly approved the last three years, and are now exclu-
sively used by all the Northern Railroads. No pains
are spared to get out new styles, and adapt them to
the tastes of every consumer.

Orders addressed to **CHARLES STODDER, No.**
75 Kilby street, Boston, will have prompt attention.
March 23, 1850. 2m

India-rubber for Railroad Cos.

**RUBBER SPRINGS—Bearing and Buffer—Ful-
ler's Patent—Hose from 1 to 12 inches diameter.**
Suction Hose. Steam Packing—from 1-16 to 2 in.
thick. Rubber and Gutta Percha Bands. These ar-
ticles are all warranted to give satisfaction, made un-
der Tyer & Helm's patent, issued January, 1849.—
No lead used in the composition. Will stand much
higher heat than that called "Goodyear's," and is in
all respects better than any in use. Proprietors of rail-
roads do not be overcharged by pretenders.

HORACE H. DAY,

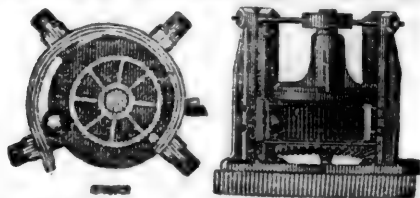
Warehouse 23 Courtlandt street,
New York, May 21, 1849.

Spikes, Spikes, Spikes.

ANY person wishing a simple and effective Spik-
e Machine, or a number of them, may be supplied
by addressing **J. W. FLACK,**
Troy, N. Y.
March 6, 1850.

MACHINERY.

Henry Burden's Patent Revolving Shingling Machine.



THE Subscriber having recently purchased the right of this machine for the United States, now offers to make transfers of the right to run said machine, or sell to those who may be desirous to purchase the right for one or more of the States.

This machine is now in successful operation in ten or twelve iron works in and about the vicinity of Pittsburgh, also at Phoenixville and Reading, Pa., Covington Iron Works, Md., Troy Rolling Mills, and Troy Iron and Nail Factory, Troy, N. Y., where it has given universal satisfaction.

Its advantages over the ordinary Forge Hammer are numerous: considerable saving in first cost; saving in power; the entire saving of shingler's, or hammerman's wages, as no attendance whatever is necessary, it being entirely self-acting; saving in time from the quantity of work done, as one machine is capable of working the iron from sixty puddling furnaces; saving of waste, as nothing but the scoria is thrown off, and that most effectually; saving of staffs, as none are used or required. The time required to furnish a bloom being only about six seconds, the scoria has no time to set, consequently is got rid of much easier than when allowed to congeal as under the hammer. The iron being discharged from the machine so hot, rolls better and is much easier on the rollers and machinery. The bars roll sounder, and are much better finished. The subscriber feels confident that persons who will examine for themselves the machinery in operation, will find it possesses more advantages than have been enumerated. For further particulars address the subscriber at Troy, N. Y.

P. A. BURDEN.

Railroad Spikes and Wrought Iron Fastenings.

THE TROY IRON AND NAIL FACTORY, exclusive owner of all Henry Burden's Patented Machinery for making Spikes, have facilities for manufacturing large quantities upon short notice, and of a quality unsurpassed.

Wrought Iron Chairs, Clamps, Keys and Bolts for Railroad fastenings, also made to order. A full assortment of Ship and Boat Spikes always on hand.

All orders addressed to the Agent at the Factory will receive immediate attention.

P. A. BURDEN, Agent.

Troy Iron and Nail Factory, Troy, N. Y.

CHILLED RAILROAD WHEELS.—THE UNDERSIGNED are now prepared to manufacture their Improved Corrugated Car Wheels, or Wheels with any form of spokes or discs, by a new process which prevents all strain on the metal, such as is produced in all other chilled wheels, by the manner of casting and cooling. By this new method of manufacture, the hubs of all kinds of wheels may be made whole—that is, without dividing them into sections—thus rendering the expense of banding unnecessary; and the wheels subjected to this process will be much stronger than those of the same size and weight, when made in the ordinary way.

A. WHITNEY & SON,
Willow St., below 13th,
Philadelphia, Pa.

Brown's Old Established SCALE WARE HOUSE,
NO. 234 WATER ST., NEW YORK.

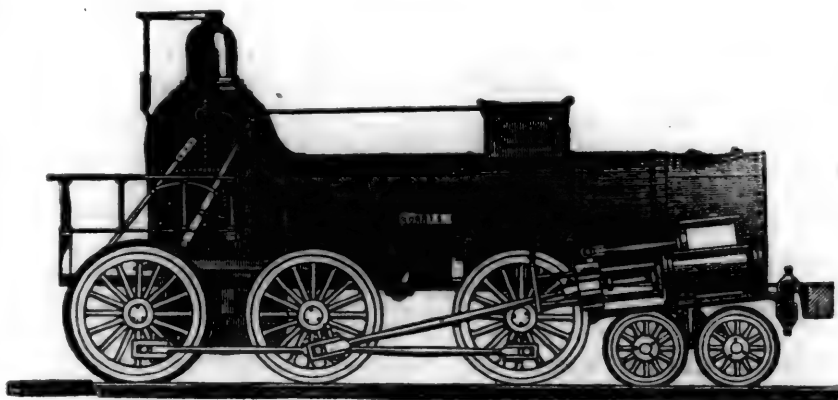
THE Subscriber, Practical Manufacturer of Scales of every description, respectfully asks the attention of Railroad Companies to his Improved Wrought Iron Railroad Track and Depot Scales which for strength, durability, accuracy, convenience in weighing, and beauty of workmanship, are not surpassed by any others in this country.

He is aware that this is rather a bold assertion for him to make, yet he can say with confidence that they have but to be tried to give them precedence over all others.

J. L. BROWN.

Bank Scales made to order, and all Scales of his make Warranted in every particular.

References given if required.

NORRIS' LOCOMOTIVE WORKS.
BUSHHILL, SCHUYLKILL SIXTH-ST., PHILADELPHIA,

THE UNDERSIGNED Manufacture to order Locomotive Steam Engines of any plan or size. Their shops being enlarged, and their arrangements considerably extended to facilitate the speedy execution of work in this branch, they can offer to Railway Companies unusual advantages for prompt delivery of Machinery of superior workmanship and finish.

Connected with the Locomotive business, they are also prepared to furnish, at short notice, Chilled Wheels for Cars of superior quality.

Wrought Iron Tyres made of any required size—the exact diameter of the Wheel Centre, being given, the Tyres are made to fit on same without the necessity of turning out inside.

Iron and Brass castings, Axles, etc., fitted up complete with Trucks or otherwise.

NORRIS, BROTHERS

PATENT MACHINE MADE HORSE-SHOES.



The Troy Iron and Nail Factory have always on hand a general assortment of Horse Shoes, made from Refined American Iron.

Four sizes being made, it will be well for those ordering to remember that the size of the shoe increases as the numbers—No. 1 being the smallest.

P. A. BURDEN, Agent.

Troy Iron and Nail Factory, Troy, N. Y.

Etna Safety Fuse.

THIS superior article for igniting the charge in wet or dry blasting, made with DUPONT'S best powder, is kept for sale at the office and depot of

REYNOLDS & BROTHER,

SOLE MANUFACTURERS,

No. 85 Liberty St.

NEW YORK.

And in the principal cities and towns in the U. States.

The Premium of the AMERICAN INSTITUTE was awarded to the Etna Safety Fuse at the late Fair held in this city.

November 3, 1849.

ly

COLUMBUS, OHIO,

Railroad Car Manufactory.
RIDGWAYS & KIMBALL,

HAVE established at this central point, the manufacture of Passenger, Freight, Gravel and Hand Cars for Railroads, and assure all Western Railroad Companies that it will be their constant aim to procure the best materials and workmen, and to turn out the best kind of work at fair prices. Specimens may be seen on the Columbus and Xenia Railroad. The patronage of Railroad Companies is respectfully solicited.

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To Inventors and Patentees.

OWEN G. WARREN, ARCHITECT, Has had many years' experience as Agent for obtaining Patents, both in this country and Europe, and will transact such business promptly and reasonably. Persons at a distance can have their business done by correspondence—without the necessity of visiting this city or Washington. Office No. 94 Merchants Exchange, Wall st., corner of Hanover st., up stairs.

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AMERICAN RAILROAD JOURNAL.

STEAM NAVIGATION, COMMERCE, MINING, MANUFACTURES.

HENRY V. POOR, Editor.

ESTABLISHED 1831.

PUBLISHED WEEKLY, AT No. 136 NASSAU ST., NEW YORK, AT FIVE DOLLARS PER ANNUM IN ADVANCE.
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ASSISTANT EDITORS,
J. T. HODGE, *For Mining and Metallurgy.*
GEN. CHAS. T. JAMES, *For Manufactures and the
Mechanic Arts.*

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American Railroad Journal.

PUBLISHED BY J. H. SCHULTZ & Co., 136 NASSAU ST.

Saturday, November 9, 1850.

Are we Building too Many Railroads?

The construction of railroads is, probably, the most engrossing subject now occupying the attention of our people. Every portion of our country is aroused to their importance. In the West, the feeling in their favor amounts almost to a mania, and every farmer there is contriving how he shall secure one within convenient distance. Their influence, as instruments of wealth, are now thoroughly appreciated, and the social advantages which they confer, are scarcely less valued. Every person wants to live in the world, where he can hear and see what is going on; and mingle with his fellow man, as his interest or pleasure may dictate. People will have railroads, if they can raise the means to build them, even if they will not repay their cost in the shape of dividends. This is a settled fact, and their construction will go on till

every section of the country is penetrated with them, and till every farmer inhabiting a tolerably fertile and densely inhabited section, shall enjoy this mode of transit.

However productive railroads may prove, a long time must elapse before the most properous can, out of their earnings, return to their stockholders their first cost. Their construction, therefore, involves the permanent investment of a large amt of money. Now in works of public improvement, and in all such as involve permanent outlay, there is always danger of our investing faster than we accumulate. In such an event, embarrassment is sure to follow, which may defeat what we are seeking to accomplish, and render unproductive what may have been expended. If, as a community, we go ahead faster than our means will justify, we inevitably subject ourselves to loss, in proportion to the extent of our imprudence. Let us see how the rules here laid down apply to the railroad enterprises of the country.

The best way to determine whether we are making a healthy progress, is to see whether our railroad projects are going to pay. There is but little danger from over construction, so long as they will yield six or seven per cent. per annum, with a reasonable expectation of continuing this rate of dividend. So long as they do this, they will be sought for investment, and will never be thrown upon the market at a price below their value. Such stocks will always enable the holders to realise very nearly their cost, and keep them without crippling themselves. Money, paper money we mean, is nothing more than a credit which is always available by those who have the means of procuring it. A good seven per cent. stock will always command its equivalent. The Massachusetts railroads would have created no inconvenient scarcity of money there, if all their stocks could have maintained themselves above par, and held out reasonable encouragement of paying regularly six per cent. dividend. This would have given them currency in every part of the country. But when these stocks went down to one half and one quarter their cost, producing a general distrust of railroad property, they could not be made available for anything like their real value if they could be used at all. Money became scarce, because those who had expended it in railroads, had no means of replacing it by the securities they held.

Now we believe that as a general rule the roads to be built will pay much better than those already constructed; for the reason, that experience enables us to build much cheaper, and secondly, because every additional mile opened adds to the value of those already built. Another reason is, that a great majority of the roads in progress, are in those parts of the country better adapted to cheap construction than the Eastern States, where has been the theatre of operations. In addition to this, is the small cost of right of way, etc., which in all densely settled sections make up a large portion of the final cost. In the Western States, the roads of which call for more foreign aid than any others, railroads can be built at one half or one quarter the cost of roads in the East. The expense of grading, bridging, right of way, superstructure depot grounds, etc., are very slight. On the other hand, the prospective business of these roads is very great. We all know the inexhaustible fertility of the soil, and the ease with which every article of food can be raised. The quantity for export is enormous, and the whole of this is thrown upon railroads where they exist, from the character of the ordinary public ways. So, too, all consumed in that section, which is not produced there, has to be imported from a distance. We have every reason to believe that the average income of the Western roads will be equal to the Eastern, while their cost will be vastly less, and that consequently while the latter are at a large discount, the former will command a premium. So long as the stocks of these roads can be maintained at a premium, or rather can pay a good dividend, we have nothing to fear from their progress, for the reason above given.

Another reason why the rapid construction of railroads in the West will not tend to embarrass the business operations of the country is in the wealth they create, independent of the income from their dividends. Everything saved in transportation is so much added to the wealth of a country. It is very easy to see how a railroad may save in this way, to a community, its whole cost in two or three years. When this is done its cost is no longer felt. It has redeemed itself. All the leading railroads there will soon pay for themselves in this way, and when this is accomplished whatever they earn becomes additional capital for the promotion of new works.

Another cause of the present abundance of money

is the vast amount of foreign capital seeking investment in this country, on account of the low rate of interest, and the threatened political commotion, in Europe. The confidence in the railroad securities of this country is every day becoming stronger, and a large amount of our best known stocks are constantly going abroad. The vacuum thus created here, is filled up by those coming into our market. These will follow in the train of those whose place they have taken, as soon as they are as well known. So long as the interest or dividends upon these securities continue to be promptly paid, they will continue to be sought for on foreign account. It is in a great measure owing to this foreign demand, that the immense amount of these securities which have come into our market, have thus far created no pressure. The continued good character of these securities, as well as the further progress of our roads, depend very much upon those who are the medium between the seller and buyer. Stocks and bonds are bought chiefly on the representations of our brokers and commercial houses in this city. We can scarcely name a road South or West that is not compelled to come to New York for money. If they cannot get it here, they must stop. If, therefore, the business of railroading is overdone, it will be more the fault of those negotiating these securities, than those offering them.—The former can keep this whole movement in a healthy condition, and a safe and careful policy which shall give currency only to such securities as are undoubted, is alike the dictate of duty and self interest. Capital is proverbially blind. It always follows in the wake of public sentiment.—When this is adverse to any securities, not a cent can be had. When it is favorable, men err as far, by being too lavish in their advances, as they did before by refusing them altogether. Many of the Western States, when not entitled to credit, could obtain money in any sums, on vastly better terms than at the present moment, when the security is undoubted.

On the whole, the future was never brighter than at the present time. Money is abundant, and likely to continue so. Investments in railroad property are almost entirely confined to their bonds.—These, in almost every case, are good. There is no danger of distrust from repudiation or failure to meet the interest promptly. There is no danger apparently of anything occurring to impair the confidence of foreign capitalists. The work of preparing railroads for the iron and equipment is but a slight burden in most cases, not enough to exhaust to any injurious extent, the capital of those immediately interested in their construction. Stocks in most of our roads, as well as bonds, bid fair to pay well. We do not therefore yet see any elements in operation likely to bring on a commercial crisis. Such forebodings, which many profess to feel, we cannot see any good ground for. Railroads, like all other kinds of property, are subject to what seems to be an universal law in every pursuit, of advance and reflex, to seasons of prosperity and adversity; but we can see no reason against their general healthy growth and rapid progress.

The Hudson River Railroad.

A SKETCH OF ITS HISTORY, AND PROSPECTIVE INFLUENCE ON THE RAILWAY MOVEMENT.

Continued from page 691.

Immediate steps were taken to proceed with surveys, and in two weeks a party of engineers and their assistants were in the field, and a few days later two other parties were at work. The location of the line involved a large amount of labor. On one side lay the water, and on the other the bold and

rugged banks of the river. The zig-zag line of the river shore rendered it necessary to carry the railroad across the bays, and through the projecting lands, in order to obtain a suitable line for the work. To do this in such a manner as to secure a good line at the least expense, involved extensive measurements and computations on very irregular ground, in order to determine what amount of cutting on the points would be sufficient to fill the bays between them. The difficulty of this duty was peculiar, from the uncertainty of the bottoms that required to be filled. These were sounded, to ascertain the depth of soft mud; but as the mud varied considerably in consistency, the sinking that would take place, under the load that must be laid upon it, was necessarily more or less a matter of conjecture, and very much embarrassed proceedings, from the uncertainty caused by this circumstance. The directors manifested great anxiety to get the work under contract, which was no doubt highly desirable and important; but it was no less important to consider that a great and difficult work was to be done, and the means to accomplish it were comparatively small, requiring the utmost vigilance, in order that so much might be accomplished, with the means provided, as to inspire a confidence that would be sufficient to provide such further means as the exigencies of the project would require.

As soon as maps of location for the respective divisions could be prepared, the directors proceeded to procure the right of way. The sums demanded for this were, for the most part, highly exorbitant. The amount paid may be considered, on the average, to be at least four times the real value of the land taken. It is believed very few, if any, of the owners would be willing to have the railroad removed, and their land restored to its original condition. Could more time have been taken, this expense would no doubt have been much reduced; but the anxiety to proceed with the work overruled.

The line of work from 32d street in New York to Breakneck Hill, a distance of 53 miles, divided into 39 sections, was offered for contract on the 20th July, 1847. A few days after, proposals were accepted by the board of directors for the whole of the sections, and contracts were executed for the greatest part in a short time after. Some of the persons whose proposals had been accepted, delayed to execute their contracts, and others never appeared. It was, however, mostly got under contract before the 1st of September.

The character of the work did not, in general, permit it to be commenced as promptly as could be done on inland roads. Embankments were to be constructed which were to be carried across the river bays, and along the margin of the river, where most of the filling was required; and it was necessary, in all earth work, to construct a river wall, to protect the earth from being carried away by the surf from the river. This rendered it necessary to bring the stone for this purpose by boats, requiring an outfit not usually necessary, and the process was not familiar to many of the contractors, and hence arose indecision and delay. The greater part of this protection wall occurs where an artificial foundation is made by filling in a mass of loose stone, which is brought up to low water level, and then levelled off and the wall commenced. The wall is about seven feet thick at the base, and three feet at the top. As soon as the foundation was prepared, the work was commenced at low tide, and prosecuted until the rise of the tide obstructed further work, and then left for the next tide. Until the wall was brought to high water level, the work was very much embarrassed by the interruptions in waiting for the proper state of the tides. It might be supposed the river navigation would afford great facilities for bringing stone to the work, and this was no doubt useful, when they had to be obtained from a distance of several miles, or from the opposite side of the river; but there was a serious drawback to this facility, from the position and circumstances under which the vessel had to discharge.—There could be no wharf, and the state of the wind and tide often prevented the vessels from coming to the spot, or laying where they could unload; a circumstance materially embarrassing to the progress of the work.

The collection of materials, the erection of temporary buildings, and providing tools and machin-

ery, occupied the attention of contractors so much, that only a small amount of work was done during the fall of 1847. The total amount, up to the 1st of November, was \$36,425, and on the 1st of December, \$77,609.

In June, 1847, two parties were organized under the direction of John T. Clarke, Locating Engineer, to survey the line from Fishkill Landing to Albany, a distance of 53 miles. Two routes were surveyed; one inland, on the line run by Mr. Morgan, and the other on the margin of the river. The survey was made with great care, and the question submitted to the directors in a report made by the writer on the 12th of January, 1848. The report, after fully, and it is believed, frankly discussing the two routes as to cost and capacity of business, recommended the river route as the best calculated to answer the great objects of the enterprise. Great local excitement was produced, and the report was attacked with much severity by those who entertained different views as to the policy recommended. After a delay of several weeks, for examination, the board of directors adopted the river route, as recommended by the report. At a future day it will be interesting to look over the discussions that arose on this question. To adopt the river route, was claimed in the style somewhat of the Spanish Don, to be a desecration of the river, marring its beauty, and subverting the purpose of the Creator.

In December, 1847, the board of directors passed a resolution, requiring the road to be completed to Fishkill Landing, and put into operation in the fall of 1848. A minority of the board was opposed to this resolution, on the ground that it would lead to heavy extra expenses, and from the physical difficulties to be overcome, with the contingencies of such a work, they regarded it doubtful if it could be accomplished if undertaken. At this time, five miles of the line between Breakneck and Fishkill Landing, embracing much heavy work, was not under contract, and the right of way only partially secured. A few weeks after the passage of this resolution, a substitute, as a compromise, was adopted, which extended the time to the spring of 1849, and the point to be reached Poughkeepsie. It was a month after this, before the route from Fishkill Landing to Poughkeepsie was settled, and, of course, the right of way, except some conditional grants, was wholly unsettled. It was not until the 15th of March, the line from Breakneck Hill to Poughkeepsie was ready for proposals, and between this time and the 1st of April the contracts were concluded for the most of it. The right of way for the greater part of this section was not secured, and some heavy sections were delayed from this cause, so that the work could not be commenced until July, and a less important section was thrown up on this account, and had to be re-let. The contract involving the greatest difficulty of execution on this portion of the line, was unfortunately given to incompetent men, and it was found necessary to vacate and re-let it. This was section 45, embracing a tunnel of 842 feet in length, and about 50,000 cubic yards of rock cutting at the entrance of the tunnel. Work to the amount of \$6,000 had been done, when it was undertaken by H. D. Ward & Co., about the 1st of August, 1848. There was then work to the amount of about \$150,000 to be done. The tunnel and rock cutting, however, was the part that presented the particular difficulty of this section. The open cutting came up to the tunnel at the respective depths of 50 and 70 feet, rendering it necessary to hoist the greater part of the rock excavated from the tunnel through shafts perforated from the surface. The work was prosecuted with great energy by Messrs. Ward & Co., and in about 17 months from the time they commenced it, a train of passenger cars passed through.

The rock cutting in the Highlands was particularly hard, more so than the writer has known elsewhere. A large portion of it was such that the daily amount of a man's labor at drilling would range from one to two feet only.

Much embarrassment resulted to the progress, from the sinking of the embankments and walls of the river bays. It often happened that after the wall and embankment had been brought to near the proper level, the whole would go down, totally destroying the wall, except so far as it aided by its mass to form a foundation for the future structure. This

operated greatly to discourage the contractors, and defeat the expectations of the engineer.

The following items will give an idea of the magnitude of the work:—

Length of line—New York to Poughkeepsie.....	75 miles.
Length of line exposed to the action of the river.....	44½ "
Length of river wall.....	37 "
" bridging.....	5,682 feet.
" tunnelling.....	3,376 "
Excavation of earth.....	3,863,480 cub. ft.
" rock—open cutting.....	1,085,601 "
" tunnel cutting.....	45,466 "
Loose stone in foundation of walls &c.....	380,785 "
River walls.....	293,096 "
Masonry—mostly hydraulic—about.....	40,000 "
248 culverts, for water courses, mostly of hydraulic masonry.	

15 bridges of arched masonry, for roads over and under railroad.

25 bridges of masonry, with wooden superstructure, for roads over and under railroad.

The cuttings of both earth and rock was transported to form the long embankments across the bays, which greatly increased the labor of excavation. The cuttings, or excavations, were nearly consumed to form the embankments, and very little spoil bank was made. In general, very little borrowing of materials has been made, avoiding the necessity of mutilating the country for this purpose, and the expense of double cutting.

The anxiety for an early completion of the work, that was manifested at the commencement was continued unabated during its construction. There are substantial reasons for this policy, that should have influence so far as circumstances permit.—From the time expenditure commences, the interest must be a tax, until the work is completed, and its earnings put a stop to this source of expenditure; and the business question that arises, namely, to gain a certain time in the construction, what amount of cost, over that required by the usual course of proceeding, will be compensated by the earnings during that time? This would be the course a prudent individual would pursue, and a company to be successful, must be guided by the same course. A distant view of the line could be easily obtained from steamboats on the river: but this was too distant to afford any just appreciation of the work, which could only be had by those who traversed the line on foot, aided by a row boat along shore, to pass those parts inaccessible to the pedestrian. The labor of this kind of inspection, required men who could endure a long walk over a rugged way, a circumstance that precluded much personal examination by the board of directors, who were therefore unable to form as full and accurate a judgment of the exigencies of the work, as a more frequent personal inspection would have given.—The late president of the board, A. C. Flagg, Esq., made frequent visits on the line of work, and thereby made himself familiar with its condition, difficulties, and progress.—*Hunt's Mer. Mag.*

To be continued.

Tehuantepec Route

In our last we gave the proceedings of a meeting of a committee of citizens of New Orleans, who have been selected to take the preliminary steps to obtain from the grantees of the Mexican government, for the benefit of the city of New Orleans, the right to construct the above road; these privileges consisted—

1. Of the exclusive right of establishing a communication by steam across the Isthmus of Tehuantepec by the canals, railroads, or improvement of natural water courses. The right is granted for sixty years.

2. Of a grant in fee simple of ten leagues of land on each side of the line of communication, making about five millions of acres.

3. Of exemption from any contributions or taxes on travellers or merchandise in transitu, for a term of fifty years; and exemption from transport duty, freights, lighters, tonnage, or any other class of dues.

4. Of the right to foreigners to acquire real property and exercise any trade or calling, even mining, within fifty leagues on either side of the line of transit.

5. Of an exemption from all duty on agricultural implements, and implements for the arts, for twenty years; and on all articles of subsistence, clothing, furniture, and other things useful for the construction and embellishment of houses, for six years from the establishment of the colony.

6. Of making all works necessary for shelter and use, fortresses and warehouses, in two ports, one at each end of the line, to be selected by the grantees.

The grant of the above privileges was originally made to Jose Garay, by whom it was subsequently conveyed to Mr Hargous of this city. This committee have obtained a conditional release from Mr. Hargous, of which the following is an outline:—

1. Mr. Hargous secures to the citizens of New Orleans a preference in carrying out the enterprise, and give then two years within which to organise a company for that purpose.

2. To prevent the possibility of any different disposal of the grant in the interval, Mr. Hargous makes conveyance of it to trustees, who are authorized to convey it to the contemplated company, if formed within the limit of the last two years. At the end of that time the trustees were to convey it back to Mr. Hargous, if there should be a failure of organization.

3. Mr. Hargous chooses for trustees persons who are citizens of New Orleans, and who should be approved by the committee.

4. Mr. Hargous is to receive for his privileges, lands, &c., one-third of the stock of the contemplated company, not however, to exceed three millions of dollars. For this purpose it is assumed that it would cost about six millions of dollars to carry out the work. The capital of the proposed was therefore fixed at \$6,000,000—one-third for Mr. Hargous and two-thirds for subscribers.

But it was also provided that if the work could be done for less than \$6,000,000, Mr. Hargous was to have shares to the amount of only one-half of the real cost, so as to be entitled to one third of the whole number of shares and no more. If the estimated cost of \$6,000,000 were exceeded, then any further sum required was to be raised by loan, and Mr. Hargous's shares were to bear one third of the burden of the loan, so as on all occasions and in any event to keep unimpaired the original proportion agreed on, viz., one third for Mr. Hargous and two-thirds for subscribers.

5. Mr. Hargous was to be reimbursed for his advance of half a million, but instead of cash he was to receive only one-fourth of it when the company should be actually organized, and the remainder in one, two and three years from that date.

Pursuant to these agreements a deed of trust of the privileges possessed by Mr. Hargous has been executed to the following gentlemen, viz:

Peter Conrey, Jr., Leonard Mathews, J. P. Benjamin S. J. Peters, J. M. Lapeyre and Bernard Fallon, and the control of the enterprise of a Tehuantepec railway is now vested in the city of New Orleans, for a term which will expire on the 2d day of May, A. D. 1852.

In relation to the depth of the water at the mouth of the Coatzacoalcas the report says, that careful surveys show the mouth of the river has "fourteen and a half feet depth at low water, for a width of fifty feet, and that the water gradually shoals on each side of this pass to 13 and 12½ feet, which latter depth is maintained through a pass 350 feet wide. This bar, moreover, is of rock, and only 80 feet thick, admitting easily of being deepened, if necessary. But its present depth is entirely sufficient for a large class of steamships, and all doubt is now removed on the gulf shore."

Major Barnard, to whom was entrusted the examination of the harbor on the Pacific coast, reported to the committee that he considered himself warranted in assuring them that the entire enter-

prise was feasible, provided a harbor could be found on the Pacific coast. He had also suggested his impression that the roadstead on the Pacific coast would suffice for all commercial purposes, even if no harbor could be found. The committee having now the satisfaction to report that this impression has been confirmed since Major Barnard left for New York, where he has made arrangements for the survey, as shown by the following extract of a letter to the committee, dated on the 29th September, 1850:—

"I was well aware, and represented the fact to you, that a large part of our intercourse with Mexico during the war was carried on in this very way, in face of the violent northers which prevail in the Gulf. Also, that steamers enter no harbor at Chagres, but lay off as unprotected as they would be at Tehuantepec, and that even at Panama, they lay out in an open gulf. I could not feel much doubt about the matter, therefore; yet, not being a seaman, I could not speak with the confidence which professional knowledge would have given me. Since that time I have consulted several naval officers well qualified to give an opinion on the subject—among others Capt. Porter, of the Georgia, Lieut. Maury, of Washington, and Lieut. Radford, who has coasted along the shores of the Gulf of Tehuantepec. They all, without any hesitation or qualification, express their belief in the practicability of the matter. Capt. Porter thinks that it is a better place than Chagres for steamers to touch, as the strong winds (and in this they all agree) are off the land."

Growth of New York.

We copy from the *Tribune* the following:

Table showing the whole number of New Buildings erected in each Ward of the City of New York, during a period of 11 years, from 1840 to 1850, inclusive. Prepared from the Official Documents:

Wards.	Aggregate 11 years.
I.....	536
II.....	361
III.....	353
IV.....	211
V.....	272
VI.....	400
VII.....	439
VIII.....	409
IX.....	1335
X.....	394
XI.....	1185
XII.....	1314
XIII.....	317
XIV.....	352
XV.....	1004
XVI.....	3955
XVII.....	1277
XVIII.....	1295

Total.....15,409

Manufactures of Cincinnati.

The Cincinnati Prices Current, says that city has only five cotton Factories, which run 19,400 spindles, and produce annually 3,186,000 yards of brown sheetings and 1,914,000 lbs. cotton yarns, valued at \$458,000. The capital invested in the buildings and machinery is estimated at \$220,000. They consume 4,350 bales of cotton annually, and employ 505 hands. Mr. Smyth, the editor, computes the whole number of spindles running in the West at 102,220, and their annual consumption of cotton at 27,350 bales. Hence, Cincinnati manufactures about one-sixth of the entire amount of cotton manufactured in the west.

Its rolling mills, foundries and machine shops, are on a much more extensive scale. There are several rolling mills, including those in the vicinity of the city, with an invested capital of \$765,000, consuming annually 15,900 tons of pig iron, 1,050 tons of scrap iron, 5,800 tons of blooms, and 1,100,000 bushels of coal, and producing \$1,580,000. The number of hands employed in these establishments is 945. There are also 14 stove foundries, with an invested capital of \$557,000, con-

suming 10,175 tons of pig and scrap iron, 188,900 bushels of coals and coke, and making about 100,000 stoves, valued at \$892,000. These employ 888 hands. There are 28 machine shops and foundries, with an aggregate capital of \$1,498,000, and consuming annually 15,331 tons of iron, and 640,500 bushels of coals and coke. The product of these establishments is valued at \$2,459,000, and they employ 1,799 hands. The entire aggregate of the iron manufactures presents an invested capital of \$2,815,000, a consumption of 48,196 tons of iron, and of 1,929,400 bushels of coals and coke, and a production of \$4,931,000, the whole number of hands employed being 3,624. The next most important branch of manufactures is lard oil, in which there are engaged no less than 40 establishments, producing annually 33,000 bbls. oil, and 7,000,000 lbs. stearine, valued at \$1,119,000.

New Hampshire.

Concord Railroad.—It is stated that the Governor and council of New Hampshire have confirmed the lease of the Manchester and Lawrence road to the Concord. The terms of this bargain have not been published, but the Belknap Gazette, of Meredith Bridge, N. H., says that the Concord is to pay to the stockholders of the Manchester and Lawrence two per cent per annum *less than it pays* to its own proprietors. The announcement of the lease has favorably affected the Manchester and Lawrence, but has rather injured the Concord stock in this market—*vide* recent sales of both.

Maine.

York and Cumberland Railroad.—It will be seen by advertisement, that the first instalment of this road's subscription for the work on the westerly end has been called in, and we understand the work is being pressed with a resolution to connect Alfred with the Boston and Maine road at Great Falls, early next summer.

We hope the central portion of the line will find equally zealous friends to put that section also in like early progress.—*Adv.*

A PROBLEM FOR GEOLOGISTS.

Last week, John Mussey, Esq., had occasion to blast a large solid bolder of granite on his farm in Cape Elizabeth, for the purpose of removing it.—The bolder was without seam, or crack, or any appearance of one. On prying open one of the rifts, made by the blast, there was found the body of a half grown frog, with his tongue thrust out of his mouth, as if forced out by the pressure. There was a cavity in the solid stone, just of the size, form, and capacity, to receive the frog's body, and from which it was taken.—*Portland Argus.*

THE PANAMA ROUTE.

In another column we give the passengers, 50 in number, of the brig Kate Anderson, which sailed this afternoon from Cummings' wharf, for Chagres. She takes out the machinery and fitted carpenters' work for two steamboats that are to run on Chagres river, having been built at this place under the superintendence of A. G. Jewett, Esq. Among her passengers are the captains, engineers and crews of the two boats which are all prepared to be set up on their arrival. Four engines of 50 horse power each, are taken out to propel the boats, and everything provided to facilitate, in connection with the Panama railroad, the passage of the Isthmus. The passengers for the most part are to be the crews of the steamboats above named, though some are carpenters and other mechanics, who go out to assist in setting up the boats, etc.—*Bangor Mercury, 2d November.*

Virginia.

Manassas Gap Railroad.—We learn from the Alexandria Gazette, that the surveys on the route of the contemplated Manassas Gap railroad, are progressing with spirit and success, under the superintendence of the engineer, Mr. Goldsborough.

The next meeting of the president and directors

will be held on Thursday next, and it is probable that an order may then be passed for letting out for contract the first twenty miles. The surveys show the route of the road to be a very favorable one for construction, and the estimated expense per mile very low.

Maine.

Kennebec and Portland Railroad.—This company having been placed in funds by the favorable action of the towns along its line, is now resuming the vigorous prosecution of the work. Large gangs of men are engaged upon the different points, and the operation of laying the iron from Topsham to Richmond has been commenced. The portion of the line opened is doing a good business, and with abundant means there is now no obstacle in the way of an early completion of the road to Augusta.

Glendon Iron.

The American Institute of the city of New York has awarded a Gold Medal to the Glendon Works, of East Boston, Mass., "for Locomotive and Car Tires, and beautiful specimens of Iron."

Pennsylvania.

The remainder of the western division of the Pennsylvania railroad was let on last Friday. The contracts stipulate for the completion of the work by the spring of 1852. Thus, the whole of this great improvement is now under contract, excepting the mountain division, and as the Portage railroad will be used temporarily as a part of the line, the completion of the portions now in the hands of contractors will establish a continuous railway communication between Philadelphia and Pittsburgh.

New York.

We learn that the directors of the Buffalo and Cohocton Valley railroad company have resolved to construct the road from Painted Post to Batavia, and to put it under contract with the least possible delay. A large proportion of the capital stock has already been subscribed, and the directors, with other wealthy individuals, have entered into written obligations to procure subscriptions for the remainder of the stock.

English Railways.

It appears from a return just issued that the amount of income tax paid by railway companies for the year ending the 5th of April, 1849, was for England and Wales, £168,886, and for Scotland, £16,035—total, £184,921. This would represent a net income £6,164,033 for the year. The passenger tax paid by railway companies for the year ending the 31st December, 1849, amounted to £218,889 18s. 10d. in England, and to £19,009 15s. in Scotland; together, to £237,909 13s. 10d. Adding the income tax and the passenger duty together, they make £422,830 as the amount paid by railway companies in Great Britain to the government in one year. It is probable, from the increased traffic on the railways in the present year, that the government taxes on railway property will amount to about £500,000 for the year 1850.—*Min. Jour.*

New York.

Col. Seymour, Engineer of the western division of the Erie road, informs us that the station house now being erected by the company at this place is 300 by 85 feet, with a wing 80 by 30 feet, for passenger and offices; that the engine house, machine shop and freight house are to be commenced immediately, and the work of enlarging the wharf recently purchased by the company for the purpose of securing a convenient and favorable connection with the lake will be commenced as soon as navigation closes, so that by the 1st of May next, we hope to see ample facilities for the transhipment of freight and passengers directly from the cars to the steamboats.—*Dunkirk Jour.*

Railroad Car Manufactory in Ohio.

A Magnificent Car.—On Thursday we inspected a new passenger car that had just been put on the Columbus and Xenia road, from the car factory of Ridgway & Kimball, of this city. It is a most magnificent affair, far surpassing any of those formerly built by them, and fully equal to the very best on our eastern roads. The painting and ornamental work is exceedingly beautiful, and in excellent taste. The seats are on a new plan and very easy. The travelling public, with one voice, give the Columbus and Xenia road, and the cars and conveniences thereon, the name of *the best* in the western country. Indeed we doubt if it has an equal in the Union.—*State Jour.*

Ohio.

Ohio and Mississippi Railroad.

We learn from Judge Ellis, the indefatigable President of this road, that the amount of present subscriptions are—

Cincinnati city.....	\$600,000
Individuals.....	400,000
Subscriptions made and expected on the election of a board of directors by stockholders, Dearborn county.....	100,000
Ripley county.....	75,000
Jennings county.....	75,000

\$1,250,000

This is more than enough to obtain the right of way, to grade the road, and create bridges, stations, etc., as far as Rockford, or some other point of intersection with the Jeffersonville and Columbus railroad. The iron can be had on the usual credits if further subscriptions are not made.

The work will, in all probability, be commenced this fall, and pressed to completion soon as practicable. With proper energy the line can be wholly put under contract before next summer, and the work all completed in 1852. In the meantime other portions of the main line can be put under contract.

This movement should, even if there were no other reasons for doing so, induce our citizens to give further aid to the Jeffersonville and Columbus railroad, so that within two years we may be enabled to connect this city with Cincinnati by trains, making the whole distance in from four and a half to five hours.

Cleveland and Erie Railroad.—The directors held a meeting here yesterday, and determined to put this end of the road into the hands of the contractors immediately. Arrangements have been made for the purchase of the iron required for the distance from Cleveland to the Pennsylvania line; the grading of the road, and preparing it for the superstructure, will be vigorously prosecuted at this end the present fall and coming winter. It is intended to have the portion of the road between here and Painesville, thirty miles, completed and open for use by the 1st of August next.—*Cleveland Herald.*

Cleveland, Norwalk and Toledo Railroad.—We learn by the Toledo Blade that the directors of this road are pushing on the great enterprise with spirit and resolution. The Blade says, "since their failure to obtain the votes of stock by the counties of Huron and Sandusky, they are redoubling their efforts, and expect to increase the individual subscriptions in Huron county, from \$100,000 to \$175,000, and in the same proportion along the line.—In the mean time, they are obtaining the right of way, in which they meet with great success, and an instalment of five per cent has been ordered to be paid to the treasurer on or before the 2d day of December next.

West of Fremont, the individual subscription is

next to nothing, and the citizens of Toledo are called upon to vote a subscription of city stock to the amount of \$50,000; the vote to be taken on the 30th inst.

The engineers were put upon the line at Fremont last Monday, and are now making their way towards us, and preparing the line for letting. The directors are now bending their whole energies towards putting this section under contract this fall, and nothing but a failure on our part will prevent it."

Columbus, Piqua and Indiana Railroad.—We learn from some of the directors of this company that such arrangement has been made in relation to the bonds of this and Champaign counties as settles the question in favor of the road; and that a portion of it will be let to contract this fall. A meeting of the board is to take place here one week from to-morrow at which the route will be definitely settled and arrangements made for a letting.—*Piqua, O., Register.*

This road is a continuation of the Ohio Central road, west from Columbus, Ohio, to the Indiana line.

Georgia.

Wilkes Railroad.—The Washington (Ga.) Gazette says:—The stockholders of this company met on Saturday last for the purpose of electing a president and board of directors. Stock to the amount of \$128,900 was represented, and the following gentlemen chosen by a unanimous vote: A. L. Alexander, President; Samuel Barnett, Sec. and Treas.; James D. Willis, John Jordan, L. M. Hill, I. T. Irvin, Jr., Lewis S. Brown, A. A. Cleveland, Green P. Cozart, L. J. Gartrell, Wm. M. Reese, M. P. Callaway, John H. Pope.

We learn that the contract for the entire line has been let to a large company, who are expected to commence work about the close of the year.

Coal Trade for 1850.

The railroad has sent this week the unprecedented quantity of 50,201 tons of coal to market. The receipts of the company for tolls and transportation on coal, merchandise and passengers, for the week cannot fall short of one hundred thousand dollars.

The demand for coal continues brisk for all kinds on board at Richmond, and retail at Broad street, and prices remain firm both at Philadelphia and in this region. The weekly demand, from what we can learn, is greater by 10 or 15,000 tons than the ability to carry to market.

The quantity of coal sent to market this year from the Shamokin region to Oct. 17, was 14,377 tons, about the same quantity that was sent last year.—*Pottsville Journal.*

Lehigh Canal Trade.—The following is the quantity of coal which passed the weigh-lock at Mauch Chunk, during the week ending Oct. 26th, 1850:

From	tons.	cwt.
Mauch Chunk	19,869	12
Beaver M. mine	433	06
Spring Mt. coal	185	13
Coleraine coal	133	00
Rock Port		
Buck Mt. Co	4,568	18
White Haven		
Wilkesbarre Co	368	11

Total.....25,650 00

North Carolina.

North Carolina Railroad Company.—We copy he annexed from the Greensboro' Patriot of last Saturday's date:

The directors of the North Carolina railroad company met in this place on Thursday evening last—all present except Mr. Graham and Mr. Perkins.

John W. Norwood, of Hillsboro, was elected a director in the place of William A. Graham resigned.

Joel H. Lindsay tendered his resignation of the office of Secretary and Treasurer; but on the solicitation of the board, consented to continue in the office.

We learn that the affairs of the company were pretty thoroughly talked over, but we are not informed that any action was taken, or now considered necessary, touching the interests of the same.

The board will meet next in Raleigh, on the call of the President.

Richmond.

A visit to Richmond, on the Delaware, at the present time, is calculated to astonish such of our citizens as seldom pass beyond the limits of the city proper. The coal trade is in full activity, and hundreds of vessels crowd the wharves. It is estimated that from 45,000 to 50,000 tons of coal pass over the Reading railroad weekly, all of which is shipped as fast as it arrives, at Richmond. One day last week, an individual counted 425 schooners, brigs and canal boats in the immediate neighborhood of the depot. A vessel carrying 150 tons can be loaded in the course of a few days. The arrangements of the Reading railroad company in this respect are admirable, and every facility is afforded. New houses are starting up in every direction in the neighborhood. They rent, too, with the utmost readiness. No less than thirty-eight omnibuses pass from the Exchange to Richmond and back again, several times every day. The scene is, indeed, one of extraordinary activity and bustle, and an immense amount of business is transacted there. Richmond has started into existence in the course of a few years, and its progress is truly wonderful. Such of our citizens as doubt, should step into an omnibus, visit, and judge for themselves.—*Phila. Inquirer.*

South Carolina.

Laurens Railroad.—We find in the Laurensville Herald, the proceedings of a late meeting of the stockholders of this road. Reports from the Chief Engineer, President and Treasurer were presented, containing a full statement of the prospects and condition of the enterprise.

The Engineer, Col. W. S. Brown, calculates the expense of the road, when finished and in working order, at \$179,572, the whole distance being 30 miles 300 feet. "The location," he says, "is a good one, with very little of deep excavation or high embankment—crossing no large streams, and very few of any kind—very straight, and with no objectionable curvature, it presents as few difficulties probably as any like distance of railroad in the State."

The following officers were elected: President, James H. Irby; directors, John Smith, Alsey Fuller, John D. Williams, John F. Kern, F. Nance, H. C. Young, John Garlington, J. A. Egleberger, Robert Pitts, James Nesbit, Dr. Jno. W. Simpson, and C. P. Sullivan.

Alabama.

Mobile and Ohio Railroad.

This company, through its Chief Engineer, Capt Childe, and two of its directors, F. B. Clarke and John Bloodgood, Esqs., who have recently visited New York for this purpose, have concluded a contract with the house of Raymond and Fullerton, of this city, for rails sufficient for the first section of the road, 33 miles from Mobile. These are to be delivered in the winter, and are to be laid early in the spring. They are of the T pattern, of the best quality, weighing 65 lbs. to the yard, and are bought on very favorable terms, for cash, the company purchasing a heavy rail adapted to the immense traffic that must pass over the road from every latitude in the United States.

We are happy to record the rapid progress of

this great work, so important to Mobile and the whole southern country. It is in able hands, runs through a section of great wealth and productiveness, and with the aid of the lands recently granted by Congress, in addition to private means, we see no reason to doubt its completion to the Ohio river at an early day, there to connect with the Illinois line extending to Lake Michigan.

Vermont.

A meeting of the citizens of Montpelier, Vt., was held on the 26th ult., Hon. Daniel Baldwin in the chair, at which was discussed the practicability of constructing a continuous railroad, leading from the terminus of the Boston, Concord and Montreal at Wells river, in Newbury—via Montpelier—and thence in the valleys of the North Branch and Lamoille river, to connect with the Vermont and Canada road at Georgia or St. Albans. The feasibility of that part of the proposed road lying between Newbury and Montpelier was demonstrated by reference to maps and surveys recently made by an able engineer; a committee was appointed to take charge of the project.

Alabama.

Alabama and Tennessee Railroad.—The following gentlemen have been chosen directors of the above road for the current year: J. W. Lapsley, T. B. Goldsby, J. F. Connelly, P. J. Weaver, W. Plattenburg, of Dallas; E. King, of Shelby; W. Reynolds, W. Curry, of Talladega; H. H. Allen, of Benton; P. Phillips, of Mobile.

Ohio.

Railroad from Dayton to Greenville.—The principal citizens of Dayton had a public meeting a short time since, with the object of devising a mode to raise the funds to complete at once the railroad from Dayton to Greenville. There appears to be no doubt that the money will be raised, and the road completed forthwith.

Indiana.

The grading, grubbing and masonry of the Richmond and Miami railroad, from this place to the State line was let on Monday last. The work was taken by citizens of this place, and on much more favorable terms for the company than was anticipated. That portion of the road from Eaton to the State line was let on Thursday week, so that the whole line from Cincinnati to this city is now under contract.—*Richmond Jeffersonian.*

The directors of the Terre Haute and Richmond railroad company, east of Indianapolis, met the stockholders and citizens in mass meeting on the 26th of October, in Greenfield.

The object of the meeting was briefly stated by Thomas Tyner, president of the company, to be the propriety of an immediate action, and letting of a portion of the work.

James P. Foley, Esq., was chosen secretary of the meeting.

The meeting was then addressed by P. Johnston, S. Meredith, Gen. J. Milroy and others.

On motion of D. S. Gooding, Esq., it was Resolved, To sustain and push forward immediately the work, with all possible energy. And it was further resolved, as the opinion of the meeting, that the road, when completed, will pay a large per cent., and command the great business from the Atlantic to St. Louis, and will not be rivaled by any route in the great west.

A sufficient amount of stock was then taken, and it was ordered by the board that the grubbing and grading, commencing at the depot at Knightsown, thence to Greenfield, be let to contractors at Green-

field on Saturday the 23d day of November, 1850.
—*Indiana Statesman.*

Virginia.

Meeting of Manufacturers and Miners.—At a meeting recently held in Richmond, composed of those interested in manufacturing and mining in Virginia,

On motion of Holden Rhodes, Esq., Joseph R. Anderson, Esq., was appointed chairman, and W. B. Hamilton, secretary.

On motion, the following resolutions were unanimously adopted:

1st. That a convention of all persons interested in mines and manufactures in Virginia be called to meet in this city on Thursday, 5th of December next, to consider the present condition of these interests, and the best means of promoting them.

2d. That Holden Rhodes, Wm. B. Hamilton, Wm. S. Triplett, E. B. Bentley, R. B. Haxall, A. S. Wooldridge, J. R. Anderson, A. F. D. Gifford, and H. Kent, be appointed a committee of correspondence, to invite the attendance of the manufacturers and miners, and of others, within the State, or elsewhere, having similar interests, or favorable to the encouragement of them.

Georgia.

Georgia Railroad.—The comparative statement of the earnings of this road for the month of September, 1849 and 1850 stands thus:

	Passengers.	Freight and mail.	Amounts.
1850....	\$22,087 15	\$36,563 19	\$58,650 34
1849....	15,398 64	31,025 15	46,433 79
Increase	\$6,688 51	\$5,528 04	\$12,216 55

Canada.

Lake St. Peter.—We are informed that the engineers employed to examine the channels in Lake St. Peter have returned to this city, and prepared their report, which will be immediately published. They unanimously agree in recommending the adoption of the old channel, and that measures be taken to procure a uniform depth of 16 feet water.

Both channels, it appears, are covered at bottom to a considerable depth, with a muddy deposit, brought down by the St. Lawrence and its tributaries. It is of a light, flocculent nature, with a slight admixture of sand, which has a tendency to form a thin crust on the upper surface. But for this, a stream of moderate force, say three inches to the second, would carry the mud away as it came down. By the occasional use of the dredge or the harrow, the required depth, when once gained, can be easily preserved.

The engineers advise that one channel be selected, to be of the uniform depth of 16 feet, and at least 450 feet wide; and that the other channel be closed up, so that the whole force of the stream may be available for the channel chosen for use, in order keep it clear. In recommending the choice of the old channel, they are partly influenced by the fact that the required width exists there already, whereas the new channel is only 150 feet wide, and partly by the consideration that the expense of preparing the latter for use, according to the proposed plan, would be nearly double that of preparing the former—in fact, would require an outlay of about £60,000 more than would be needed for the old channel.

The report will be published forthwith, for the information of all concerned. An important step has now been taken towards a satisfactory settlement of the question which has so long been in dispute, and the removal of the impediments to the navigation from Quebec to Montreal.—*Pilot.*

Michigan.

Central Railroad.—The cars ran through from New Buffalo to Michigan city on Monday evening—large numbers of the citizens of the latter place taking passage on their return. Thus it is that another village is strung upon this iron chain, that shall ere long, link Chicago with the mart of the Atlantic.—*Chicago Democrat.*

Uses of Railroads in Equalizing the Prices of Agricultural Productions.

It is in a country like the United States, of extended area, that the advantages of railroads are most strikingly illustrated. We have almost every variety of climate, and by means of railroads, the appropriate productions of each are diffused and scattered over the whole country, so that all enjoy whatever is excellent in the climate of each. The sphere of our comforts are enlarged just in proportion to the rapidity and ease of transit.

Another striking advantage of railroads is the office they fill in correcting the inequalities of production, which, in an extended country, always limit and qualify the rule of general abundance. No parts of our country are uniformly blest to the same extent. In every year, some sections are more fortunate than others. The soil that is prolific this year, refuses its customary return the next. Excess of drought or wet, are always prevailing in some part of our wide domain; and these, though they may cause great distress wherever they are felt, are scarcely appreciated or understood by the aggregate mass.

In England the loss of any one crop threatens with famine the whole population. In this country the crops of a State or section as large as the whole of that island, may prove a failure without affecting the price of food for the country. The aggregate production is ample for all, and the failure of one section is supplied by the abundance in others. Railroads, and other means of transportation, serve the office of a great balance wheel, which keeps the general supply uniform, though it may be derived this year from Ohio, the next from Indiana, and the third from Illinois. Without the means of transportation, each section would be dependent upon its own crops, and their failure would be equivalent to famine. In "a great country," and with the facilities for transportation which we enjoy, we have the elements of growth, strength and comfort not possessed by any other on the globe.—We are always certain of a good supply of food at reasonable cost, without depending upon foreign countries. Here we are ahead of all other people, and our fortunate condition in this respect will do more than all other causes to save us from commercial embarrassments, from financial crises, and political discontents. We have a broader material basis of prosperity than any other nation, and we have a right to expect in our growth corresponding results.

Tennessee.

Chattanooga Railroad.—We took a jaunt on horse back along the line of the railroad for a few miles from the city on Tuesday last, and found the workmen in large numbers engaged in laying down the track. This looks like an earnest of getting things in motion, and the thorough manner in which the work is done is a warrant that the road will be one of the best built in the United States. No section of the confederacy is so well supplied with cedar timber as this through which a portion of the road passes; and we learn that the entire distance will be laid with that material from here to the Tennessee river. Beyond that point, the road will be laid in the first instance with other timber, to be replaced ultimately with cedar. The section adjoining this city is worth a visit, to see what an immense amount of labor has been performed within a few months past; the "deep cut" at Brown's Creek being especially worthy of attention.—*Nashville Banner.*

Atlantic and St. Lawrence Railroad in New Hampshire.

We learn from the Portland Advertiser that the important question of the location of the road from the Androscoggin to the Connecticut has been determined the present week at a hearing before the State Commissioners at Shelbourne. The question was, whether the route should be by way of Lancaster, or by Berlin Falls to Northumberland.

The judgment of the Commissioners was in favor of the Berlin route, with certain mutual and satisfactory stipulations respecting a branch from Lancaster to Northumberland.

We understand from the same source that work on the line from Gorham to the Connecticut river is to be commenced at once.

In relation to the characteristics of the route selected the Argus says:—The route selected by the board of directors, and established by the board of commissioners, is that by way of the valley of the Dead river to the Berlin summit, and thence down the rich and fertile valley of the northern Ammonoosuck to the Connecticut river. This summit is about one hundred miles from Portland, is some 1,115 feet above high water in Portland harbor, and about 200 feet above the waters of the Connecticut, distant twenty miles from it. It divides waters of the Dead river, which empty into the Androscoggin, from the waters of the Ammonoosuck, which empty into the Connecticut. The valleys of these two streams form in fact one continuous valley, the highest part of the thread of that valley being the Berlin summit, perceptible to the eye only by the fact, that the waters there on each side of it, take opposite directions. And what is still more remarkable, although there are rapids in different places on the Ammonoosuck, there are no falls, properly speaking, on either of the two streams, which thread the valley. It is through this remarkable valley, that Mr. Carrigan, in a report to the Legislature of New Hampshire, stated there would be no difficulty in turning the whole waters of the Androscoggin into the Connecticut at a comparatively trifling expense—the distance between the main rivers there being only twenty-five miles, and the waters of the Androscoggin being about 175 feet higher, than those of the Connecticut.

There is but one objection to this most remarkable route, and that is, that it reaches the banks of the Connecticut some seven miles above the town of Lancaster. Now, the business which concentrates in Lancaster, is valuable to the road.—Hence, there has always been a disposition to go by way of Lancaster, if admissible.

To obviate this objection, and accommodate the business of this important point, the above company have agreed to construct and maintain a branch road to this town, towards the expense of which it has subscribed the sum of \$32,000. An arrangement has thus been effected satisfactory to all parties, and greatly for the interest of the company, which will soon by means of the road control the trade of the upper Connecticut Valley.

Pennsylvania.

York and Harrisburg Railroad.—The contractors upon this road are prosecuting the work with extraordinary industry, and it is rapidly approaching its completion. Considerably more than half the rails are laid—a locomotive to supply the rails and cross-ties is now running from York to Martin Crull's, (15 miles)—and Mr. Gonder, the contractor in chief, assures us that he is still confident of his ability to have the road open for travel by the 1st of December.

Michigan Southern and Northern Indiana Railroad.

We learn that the directors of these two lines of roads have been for the last two weeks busily employed upon the routes in both States, and have taken measures for pushing forward the works with as much expedition as possible. Several of the gentlemen connected with the road have also visited our city for the purpose of forming an association under the general law in this state, and under which this small portion of the route through the State will be completed. Their efforts, we are glad to learn, have been promptly seconded by our citizens, and it is expected the organization will be at once perfected. It is the intention to finish the ten or twelve miles through this State simultaneously with the Eastern portion of the line.

It will be remembered that these roads form a continuous line of railroad from Chicago to Lake Erie through the northern tier in Indiana.

On the Michigan line they have determined to substitute next year the heavy T rail for the flat bar upon the sixty-eight miles of the railroad now in operation to Hillsdale, and have advertised for 100,000 sleepers for the work. From Hillsdale to Coldwater, twenty-two miles, the rails are being laid, and the road will be opened in three weeks. The next twenty-four miles to Sturges, the grading is nearly completed. The rails have arrived in Michigan, and will be laid down, and this division opened early in January next, making forty-six miles of new road the present year. This brings it within eighteen miles of the Indiana line; and for this the iron is purchased and the rights of way principally secured.

In Indiana, the directors have ordered the whole road from the Michigan State-line to Laporte, fifty-four miles, to be advertised for letting by the 1st of December next, and have resolved to finish it for us in 1851. The thirteen miles from Laporte to Michigan City are not quite ready for contracting. From Michigan City to the Illinois line, along the lake is about thirty-eight miles. The grading of the 1st twenty-one miles of this, from Michigan City west, will be completed in five weeks. This is within seventeen miles of the line of Illinois, and the company have directed their Chief Engineer to have the residue graded, the rails laid down, and this whole thirty-eight miles opened for use before the middle of September next. For the balance of the road, thirteen to fifteen miles in Illinois, surveys were made in 1849, and the line was found a favorable one.—*Chicago Dem.*

NEW WHITE ZINC PAINT.

We had occasion, some few weeks since, to notice the discovery of a means of making a first-class white paint from zinc, free from the very many objections of most other pigment of a white color. It certainly does appear a grievous fact that a paint should have been so long in use as that made from white lead, which is known to all to possess such extreme powers of ill. Firstly, the preparer is poisoned; secondly, the artisan is paralyzed; and, thirdly, the public health is injured by its use. If it can strike down the strong, and slay the natural career of the otherwise healthy, what amount of harm may not be placed to its charge when we find it spread over vast surfaces, and impregnating the air of the most crowded thoroughfares? We have hitherto gone to our door and invited death, in the name of cleanliness, to take up his abode at our very hearths; it is to be hoped we shall be wiser for the future, as there is no longer any excuse for so fatal an error. The French government have acted upon this suggestion for some months past; and everywhere within the influence of official reach, the noxious white lead has been banished; and the zinc similarly prepared, under Messrs. Hubbuck and Son's patent, is being used in its stead.—*Min. Jour.*

New Orleans--The Tehuantepec Route.

In another part of our paper we have given an abstract of the report of a committee of the citizens of New Orleans upon the subject of the construction of the above road. That the project possesses intrinsic merits we have no doubt. This is by far the shortest, and being equal, probably, to the other proposed routes in all other respects, will, we think, prove the successful rival. From New Orleans it is but about two days sail to the mouth of the Coatzacoalcas, thus limiting to this extent the water route between the northern Atlantic cities and the west coast of the continent by way of the Isthmus.

While New Orleans enjoys this advantage of position, she must take one step more to reap the full benefit of it; she must open a communication with the railroads of the country, so as to render herself easily accessible to every portion of the United States. To the importance of such a connection she has seemed entirely insensible up to the present time. Unless she takes this step, Mobile may make herself the port of embarkation, through the two great roads with which she is connecting herself with the railroad system of the country. Railroads attract travel and trade on their lines with the same certainty as do the telegraphic wires the electric fluid. The old channels and modes of transit cannot succeed in the contest with the new.—And no matter what may be the natural advantages of any place, it must make use of the artificial ones which are the result of modern invention and discovery, or it will certainly go down. Such are the results which have been fully proved by experience; and they have drawn almost every town in the country, with the exception of New Orleans, into the building of railroads.

This city has now turned its attention to the project of connecting herself by railroad with Jackson, the capital of Mississippi. This in connection with the Southern railroads, will open a communication with the Mobile and Ohio, and eventually with all the roads in the country. These roads would make New Orleans an accessible point for all sections of the country, and would secure to the Tehuantepec route through that city, the business and travel which its position entitles it to command.

Indiana.

The following is an extract of the income and operations on the Erie and Wabash Canal for the year ending Oct. 1, 1850:

Receipts.

From toll and water rents.....	\$150,524 27
Lands, Logansport Office.....	53,764 32
Lands, Vincennes district.....	50,228 47
Interest, exchange.....	13,444 24
Bondholders' subscription.....	254,010 00

Total receipts.....\$521,971 30

Expenditures.

General expenses.....	\$19,803 04
Ordinary repairs of canal.....	30,840 02
Extraordinary repairs.....	24,614 81
Superintendence.....	6,215 22
Land Offices.....	1,773 47
Collection expenses.....	5,181 86
Damages and water power.....	6,630 50
Expenses of surveys.....	12,965 11
Interest to Bondholders.....	40,799 84
Construction.....	370,199 26

Total expenditures.....\$519,013 07

The exhibit shows a revenue of one-fourth of a million of dollars, independent of the bondholders' subscription, and which is faithfully applied to the prosecution of the work. The trustees are devoting themselves faithfully and efficiently to the work, and expect its completion in the fall of 1853.

Alabama.

Alabama and Tennessee Railroad.—It will be gratifying to the friends of this enterprise to learn that the directors at their recent meeting, (the whole body being present) took very decided steps for the early commencement and vigorous prosecution of the work. They located about two thirds of the road, that is, from Selma to Montevallo; and from Kelley's Springs, in Talladega county, to Gadsden, the terminus at the Coosa river—pursuing the most eastern route, by way of Oxford and Jacksonville in Benton county. This location, however, was made on condition that citizens of the counties of Benton and Randolph will subscribe one hundred thousand dollars additional stock; and that grounds for depots, station houses, &c., will be provided free of expense to the company—conditions which assurances from citizens of Benton induce the belief will be readily complied with.

The board resolved to proceed with the work, with the object of completing the road to Montevallo by the first of January, 1852—besides doing considerable work on the other side of the Coosa—and are taking steps to carry into effect this resolution.—They design despatching an agent to the north—and may be, to England soon, to purchase iron for the first 56 miles of the road, which will reach about to Montevallo; and if arrangements can be made in time, they also propose to purchase additional iron sufficient to complete the road to the Coosa river.

We understand the engineer, L. Troost, Esq., made a very lucid and satisfactory report, showing the unrivalled advantages of the road for cheap and favorable grades, etc. His report also includes an account of the survey from Gadsden to Guntersville, as made by him, and exhibits in some respects a much more favorable route than any other previous survey. A continuation of the road from Gadsden to Guntersville, is regarded as a very important point of the great scheme. There is a separate charter for that portion of the route, and we learn that active measures are being pursued to make arrangements for an early organization under that charter.

We would give a fuller account and take a more extended view of this interesting subject, but are compelled for want of space to compress our article within a short compass.—*Selma Reporter.*

Wisconsin.

We see it stated that Mr. E. F. Johnson, a distinguished engineer, passed through Buffalo a few days ago, on his way to Wisconsin, to take charge of the Fon du Lac railroad, just about to be commenced. It is to run from Fon du Lac, on Lake Winnebago, to some point on the Chicago and Galena railroad, not yet determined upon.

The gross receipts on the Ogdensburg railroad, for the month of October, being its first months business, as we learn by an official source, are as follows:—

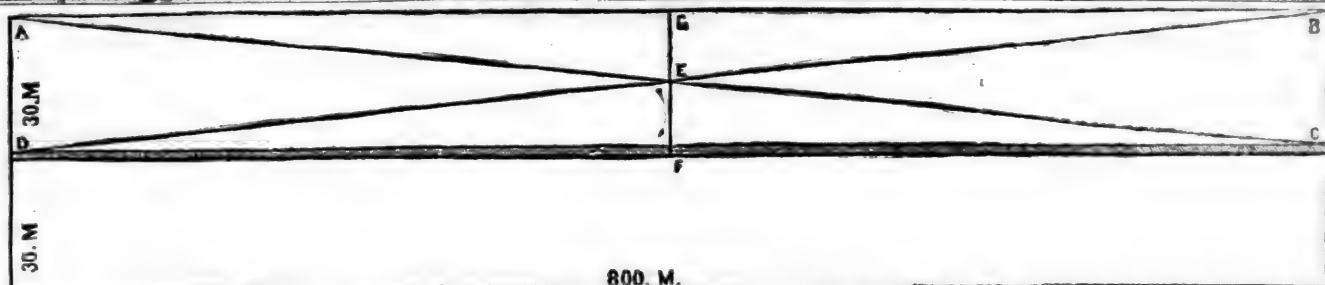
Freight.....	\$13,837 59
Passengers.....	8,269 07

Total.....\$22,106 66

A very good commencement.

RAILROAD SOLD.

The Hagerstown People's Own says that the part of the Franklin railroad, extending from Chambersburg to the Maryland line, was sold on Friday last to Mr. J. N. Hutchingston for the sum of \$17,500. Mr. H. is the agent of a company in New York, for whom the road has been purchased.



Mr. Whitney proposes that government shall set apart a strip of land, sixty miles wide, extending from Lake Michigan, or the Mississippi river, at his option, to the Pacific, a distance of 2,030 miles, for the construction of this work. The first 800 miles of this strip is good land; and Mr. Whitney says that one half of the land so set apart will build this distance. The next 800 is over poor land which will furnish very little means for this work. To construct this portion of the line, he falls back upon the remaining half of the 60 miles of good land. The proceeds of these, he contends, will be sufficient to carry the road to the available lands on the Pacific slope, which will be sufficiently valuable to construct the road to the Pacific coast.

Now all this looks very plausible, assuming, as we now do, the correctness of all his positions.—Mr. Whitney stoutly affirms that he has demonstrated the feasibility of his scheme, and paints in the most gorgeous colors the vast benefits and blessings that are to flow from its realization. It is at once to give us the supremacy of the world, and reduce all nations to a commercial vassalage to the United States, and lay their treasures at our feet.

Such are the certain results of its success. But if it should fail, how stands the account then?—Mr. Whitney, we will suppose, has built 400 miles of road with the proceeds of the lands set apart. The road, if he abandons it, becomes the property of the United States, and the 30 mile strip, which is retained, has become immensely valuable from the influence of the road, and worth, we do not know how many times more than the value of the whole 60 miles without it. In case of success, it elevates us to the very pinnacle of greatness. In case of failure, government makes a very pretty operation—in either event, it is a great deal better off for the attempt.

All this is so plausible, that a great many people say, let Mr. Whitney make a trial of his plan. If he fails, well; if he succeeds, better; no harm can come of it at any rate. It is this partial statement of his plan that has completely blinded the eyes of its supporters, and which has found it all its favor.

Mr. Whitney says he can build 800 miles of road with 30 miles of land granted. Now we all know that the land set apart is most valuable, which lies on the shores of the lake or the Mississippi, and that the expense of construction will be the least at the same points. No one will dispute these general propositions. The only difference in opinion will be in the degree of value and cost. The principle every one will admit. For the purpose of placing this more distinctly before the mind, we have prepared the following diagram.

The line A, A, represents the Mississippi, the point of starting. The line D, C, the route of the road for 800 miles through the fertile lands. The triangle A, B, D, the decreasing value of the land as you leave the river. The triangle D, B, C, the progressive increase in the cost of construction. The cost of the

300 miles, at Mr. Whitney's estimate, is \$24,000,000. Now the trapezium A, E, F, D, is just three times as large as the triangle E, F, C. If A, C, D, therefore, represent the value of the lands, and the ratio of their decreasing value, three fourths of the value is realised when one half of the 800 miles is built. But the triangle A, G, E, is equal to only one fourth of the triangle A, B, C. So that three fourths of the means for the 800 miles are realised when only one quarter of the cost of the work is expended. The proposition will then stand thus: \$18,000,000 the value of the land—\$6,000,000 the cost of the 400 miles of road—\$18,000,000 cost of the remaining portion of the road—\$6,000,000 the value of the remaining land; in other words, when Mr. Whitney has gone 400 miles he has accumulated \$12,000,000 for the further prosecution of the work.

Now Mr. Whitney goes into this matter from purely patriotic motives. He therefore will come under no obligations to complete the work. The bill carefully provides that he may choose the point of abandoning it. Now by referring again to the diagram, it will be seen that when he has proceeded 400 miles he reaches a point where the cost of the work and the value of the land are exactly equal; that beyond that the cost becomes greater and the value of the land less. At this point he has in his pocket the snug little sum of \$12,000,000. He has now arrived at the top of the hill. He will naturally pause to take breath, and survey the prospect before him. If he goes ahead, he sees that he must undergo a steady process of depletion, till he has parted with every cent he had accumulated. He is under no obligation to proceed. Will not his courage begin to fail him here? Will not his patriotism flag? Will not his experience point out difficulties in the further progress of the work which cannot be surmounted? What is the alternative before him? Twelve millions of dollars on the one hand, and honor on the other. Which alternative would be adopted, we leave for our readers to decide.

Now we need raise no question as to Mr. Whitney's intentions; we take it for granted that they are entirely pure. But he is authorised by his bill to assign his grant, if he gets it. He may be incapacitated to carry it on. His assignees are no parties to the honorable part of the original agreement. This was simply a matter of understanding on the part of Mr. Whitney. Should not Congress take some measures to secure the application of the \$12,000,000, or such surplus as must be accumulated, in the progress of the work, to its further prosecution? We think it should. And we believe that no bill will become a law without some such provision. Even if Mr. Whitney should live to superintend the construction of the work, there is no reason why the obvious common-sense rules of mutual guaranties should not be given in this case, any more than in that of the collector of the port of New York. If Mr. Whitney has no other motive

but the construction of the road, he should not hesitate to give security for the money entrusted to him any more than any public officer who is the depository of public funds, especially as he may sell out the day his bill passes. On no principle whatever should this universal rule in business affairs be dispensed with.

We think that we have sufficiently demonstrated that Mr. Whitney's scheme, instead of building the road, would be fatal to its construction, and would only result in putting money in his pocket. How much, we leave it for every one to determine for himself; that it would come up to our estimate, allowing his premises to be correct, is certain.—That it would be much larger than this estimate is very probable. But it is answered that even if Mr. Whitney abandons his project, and makes all the money that we have estimated, that the government is the better off for what is done. It is sufficient reply to say that it would be much better off by giving him land sufficient to make \$6,000,000, instead of the \$12,000,000, and retaining for its own use the balance. If government is going to work to build roads to make money out of its lands, let it make the best bargain it can; and if a strip fifteen miles will build the road 400 miles, why give the thirty?

So much for this patriotic project if it fails. If this clause in the bill, which allows Mr. Whitney to back out when he may choose, and at the same time place into his pocket \$12,000,000, is an oversight, it is an important one, and should be corrected. To this Mr. Whitney will not object, if his object is what he professes it to be. If he will not consent to the correction, his refusal discloses his motive. We will take it for granted that it is an oversight, but will say, that should the bill pass in its present shape, there never was yet an act of legislation from the organization of the first government, down to the present time, that conferred such a grant upon one individual. All the acts of favoritism recorded of Russian or English prodigality, are completely obscured by the dazzle of this great gift; and we cannot tell which to wonder at most, the profound assurance and boldness with which Mr. Whitney comes forward to ask this grant of 78,000,000 acres of land, the territory of an empire, or the ignorance, stupidity and subserviency displayed by those whom he has made to echo his views in Congress.

We have too often discussed the merits of Mr. Whitney's scheme, allowing every precaution adopted in the grant, to pursue the matter further now. It is as objectionable on its merits as it is for the reasons above given. The whole revenues of the public lands would not build it in fifty years. Mr. Whitney has fortified his positions by no authorities whatever. No engineer is called upon to vouch for the correctness of his estimates. No men of experience in railway matters are appealed to for confirmation of his statements. His data are all drawn from his imagination. There is nothing

real or tangible about it which entitles it to serious consideration. No business man would feel himself justified in *entertaining* any scheme with so little evidence in its favor. But it is useless here to enter into a discussion of its merits. The objection that we have pointed out is fatal to the project. Government is not going to be duped into the giving of ten or twelve millions to Mr. Whitney or any other individual. This is a project which should have been pushed through Congress before the people had got their eyes open. It can never meet with favor there, and it will soon become one of those useless things that make up the past.

Michigan Southern R. R. Co. \$400,000 SEVEN PER CENT. MORTGAGE LOAN.

SEALED PROPOSALS for four hundred thousand dollars of the first and only mortgage bonds of the Michigan Southern Railroad Company, bearing seven per cent. interest, will be received until the 15th day of November next.

These bonds are issued under the provisions of a special act of the Legislature of Michigan, authorizing the Company to dispose of or sell their obligations either within or without that State, at such rates or prices as may be agreed upon, and if sold below par, to be as binding as if sold at par.

They are secured by a mortgage executed to Shepherd Knapp, Esq., of the city of New York in trust for the bondholders.

This mortgage covers the entire line of the company's road in Michigan, whether already built or hereafter to be constructed, and it provides that bonds to an amount not exceeding one million of dollars in all may be issued; of which amount not more than \$400,000 can be issued until after the road shall have been completed to Sturges' Prairie, a distance of 117 miles from Lake Erie, to which point it will be completed by the first day of January next.

The security offered for the bonds is therefore a mortgage lien, and substantially the only lien, upon a road which, when completed to the State line of Indiana, will have nearly 140 miles of main line, besides a branch of 10 miles, and which will have cost, including the original outlay by the State, and the relaying the present track, about \$2,500,000; of which \$1,500,000 will be represented by stock.

The portion of the road already in operation, about 70 miles, yields an income ample to protect the entire debt proposed to be created, and the length of completed line and consequent increase of revenue, is daily increasing, affording a security which will place the payment of the debt beyond all contingencies.

For August, 1850, the earnings were \$16,417 27. For September, \$20,180. These receipts were derived from the road in its present unfinished condition. Fifty miles of completed road will be added to it within three months, and will be extended to the St. Joseph's river, at the Indiana State line, early next Spring, thus doubling the length of the main line now in operation.

This road is a part of a continuous line of railroads from the city of New York to the Mississippi river, by way of the Erie railroad and the Lake Shore road, and is an important link in the chain. Nearly the whole of this great line from New York to the Mississippi river is either completed or in the course of construction.

As the means for the construction of the road ready for the iron are provided for by stock subscribed and being paid in, by regular instalments, and the proceeds of the bonds are mainly required for the purchase of iron heavy H rail and equipments, it is believed that no railroad bonds before the public offer greater inducement for safe investment than those of this company.

The mortgage empowers the Trustees, in case of failure, to pay the principal or interest of the bonds, to take possession of the road and receive its earnings, or to sell it, on due notice, and apply the proceeds to the extinguishment of the debt.

The bonds are in sums of \$1,000 each, payable at the Mechanics' Bank, in the city of New York, Nov. 1st, 1860, with interest at seven per cent. per annum, payable semi-annually in New York, on

the 1st Nov. and 1st May. Interest warrants or coupons are attached to the bonds.

Four hundred thousand dollars of the bonds are now offered for sale.

Sealed proposals for any amount not less than \$1,000 will be received until the 15th of November next.

Proposals may be addressed to WINSLOW, LANIER & CO., No. 52 Wall street, or to E. C. LITCHFIELD, Treasurer, No. 65 Wall street, endorsed "PROPOSALS FOR MICHIGAN SOUTHERN RAILROAD BONDS."

\$200,000 (half the amount now offered) will be disposed of absolutely and without reserve to the highest bidder. The company reserve the right to withdraw the remainder if the offers are not satisfactory.

All necessary information in relation to the bonds, together with maps, may be obtained by calling on WINSLOW, LANIER & CO. or E. C. LITCHFIELD, at either of which places copies of the bonds and mortgages can be had.

Copies of the bonds and mortgage may also be seen on application to Shepherd Knapp, Esq., President of the Mechanics' Bank, or to James Van Nostrand, Esq., President of the Merchants' Exchange Bank.

Parties whose bids are accepted will be required to pay 25 per cent. upon the amount awarded to them immediately upon being notified of the acceptance of their bids, and the remainder in equal amounts on the 1st and 15th of December next, but any party will be at liberty to pay in full at once. Interest will commence from the day of payment. New York, October 3d, 1850.

GEORGE BLISS,
CHARLES BUTLER,
JOHN STRIKER,
JOHN B. JERVIS,
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Committee of Directors.

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Our long experience in the business, and the facilities we have for manufacturing, enables us to supply all orders promptly. Every article made of the best material and warranted.

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Charles Minot, Supt. do. do. do.
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E. F. Osborn, Supt. Mad River & Lake Erie R.R., O.
Sam'l Brown, Chief Clerk Freight Department New York & Erie R.R., New York.
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Great Work on Bridge Building, etc., etc.

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The present part contains beautifully executed plans, elevations, sections, and details of the Cast Iron Oblique Arch, 100 feet span, constructed on the system of M. Polonceau, over the Canal St. Denis, Gt. Northern R.R. of France, also plans, elevations, sections and details of a Timber and Iron Truss, 74 feet span, from St. Mary's Viaduct, Cheltenham and Great Western R.R., England, and a Wrought Iron Girder Bridge, 120 feet span, constructed for the London and Blackwall R.R., with the conclusion of the introductory article on the relative merits of the various forms of construction adopted, and materials employed, as regards economy, strength and durability.

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Parties remitting Mr. Duggan \$5, and the remainder \$4 when they have been supplied with the first six parts of the "Theoretical and Practical Treatise on Bridge Building, etc.," shall receive it monthly as published. To those making Mr. Duggan a present remittance of \$9, the work will be forwarded post free to any part of the United States.

NOTICE

For Proposals for Railroad Iron, for the Alabama and Tennessee River Railroad,

TO BE MANUFACTURED FROM ALABAMA ORE.

THE Alabama and Tennessee River Railroad Co. invite proposals, until the 1st of January, 1851, for Iron Rails, to be made of Alabama Iron, for the Northern Division and part of the Southern Division of their road, embracing a distance of about 105 miles. The rails are to be of the H pattern, in lengths of 18 feet, and weighing 63 lbs. per lineal yard. They are to be delivered on the Coosa river, at a landing to be hereafter designated, between Kimulgee ferry and Fort Williams, commencing their delivery on the 1st of November, 1851, and continuing it at the rate of from 80 to 100 tons per week, until the whole quantity required (10,500 tons) shall have been delivered. They are to be inspected by Lewis Troost, Chief Engineer.

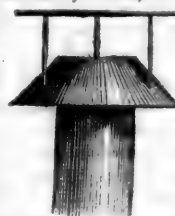
It is proper to state to iron masters and capitalists at a distance, that the country traversed by the Northern and part of the Southern divisions of the road abounds in excellent iron ore and bituminous coal, and possesses every advantage for the successful manufacture of iron, health, cheap labor and provisions.

Further information may be obtained by addressing the President of the Company at Selma, Ala. By order of the Board of Directors.

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This Ventilator is stationary, and cannot get out of order. It is constructed in such conformity to certain ascertained laws of pneumatics, as to insure a constant draft outward, whatever may be the changing direction of the wind. The Massachusetts Mechanic Association have awarded a gold medal to the inventor, and the Manufacturers have already disposed of over

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THE ADIRONDAC STEEL MANUFACTURING CO. is now producing, from American iron, at their works at Jersey City, N.J., Cast Steel of extraordinary quality, and is prepared to supply orders for the same at prices below that of the imported article of like quality. Consumers will find it to their interest to give this a trial. Orders for all sizes of hammered cast steel, directed as above, will meet with prompt attention.
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to Remove and Prevent
Incrustation (or Scale) in
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THIS valuable composition having been fully and extensively tested, is now offered to the public, as a sure remedy and preventive for incrustations in steam boilers of all descriptions. By its use, all scale is entirely removed from the boilers of Ocean and River Steamers, Locomotive and Stationary Engines, in from 3 to 20 running days, according to the size of the boiler and thickness of the scale. In New Boilers, all incrustation is prevented at a trifling expense.

The preservation of the boiler, great economy of fuel and labor, safety, and increased speed, are among the advantages to be derived from the use of this composition.

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TESTIMONIALS.

New York, August 17, 1850.

We have used Graham's Composition in the boilers of the Steamship Southerner, during several voyages between this place and Charleston. The boilers were old and very foul with scale, a very large quantity of which was removed by the use of the composition, and no new scale was formed.

From our own experience and observation in the use of the article, we are fully satisfied that it will effectually remove the incrustation made by sea water, and also that it will effectually prevent its formation.

We are also satisfied that the use of it will be attended with a great saving of fuel, and that it has no injurious effect upon iron.

DAVID N. MAXON, Engineer,
BERRY, Master,
Steamship Southerner.

Steamship Philadelphia, }
New York, August 27, 1850. }

I have used "Graham's Composition for Steam Boilers," in the boilers of Steamship Philadelphia, on the voyage to and from Chagres, and am entirely satisfied that it will remove, dissolve and prevent all scale or incrustation in salt-water boilers.

For the preservation of the boiler and economy of fuel and labor, I hereby recommend the employment of this composition in the Boilers of Ocean Steamers

WM. BISBY,
Chief Engineer.

Novelty Iron Works, }
New York, July 5, 1850. }

We have examined the specimen of Graham's Composition for preventing incrustation of steam boilers, and we believe it may be used with perfect safety in reasonable quantities for the purpose intended, as there does not appear to be any agent in the composition calculated to injure the iron.

STILLMAN, ALLEN & CO.

Piermont, May 20, 1850.

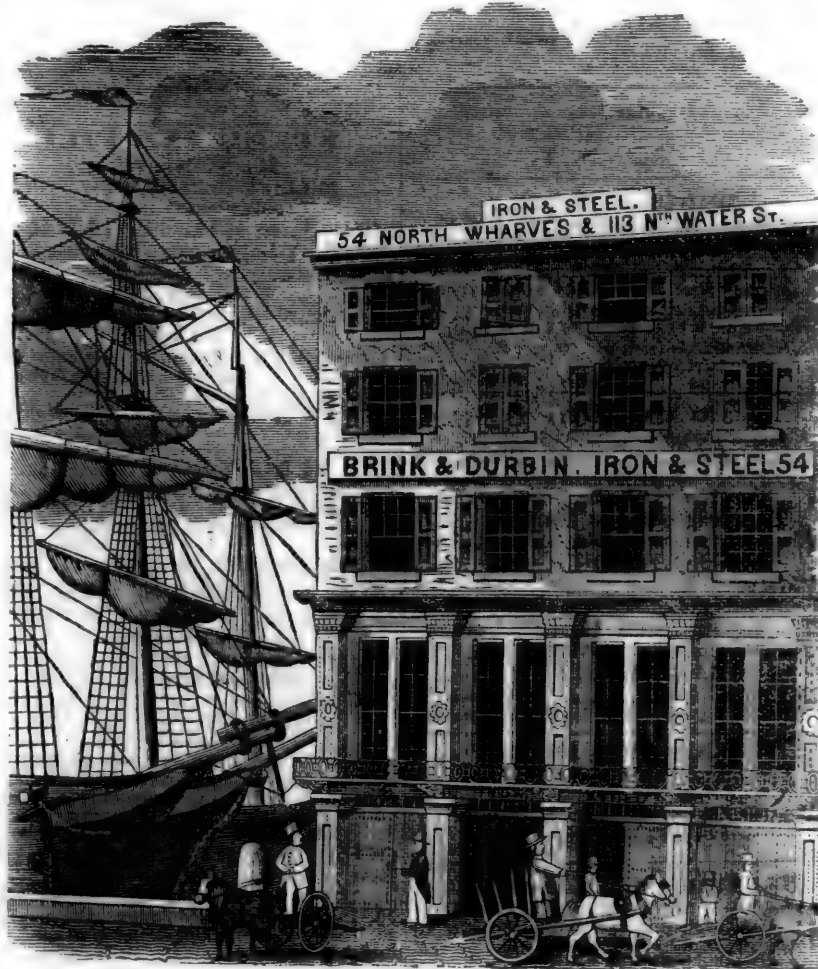
I have used "Graham's Composition," and find it to produce the intended effect; and I hereby, without hesitation, recommend it for Stationary, Marine and Locomotive Engine Boilers.

JOHN BRANDT,
Superintendent Motive Power
New York & Erie R.R.

New York, July 25, 1850.

In answer to many inquiries as to the practical effect of "Graham's Composition," I will state that I have used it in the boiler of the Steamboat Sunwick, which had become considerably incrustated with hard scale from both salt and fresh water. We used 10 lbs. per day, for three days, without blowing off the water, until the fifth day, when all was drawn off. To our astonishment, we found the whole interior of the boiler as clear of scale and smooth as when it came from the hands of the maker. The following week, we tried the same quantity in a small steam tow boat. The boiler had old scale of long accumulation and very thick. We ran the boat three days without blowing off, and on the fourth day washed out the boiler and found it, like the "Sunwick's," perfectly clean and smooth as when new. I am therefore enabled to state that the use of the composition in these two instances under my own immediate observation and direction, has been attended with complete success.

JAMES MORROW,
Engineer Astoria Ferry.

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Of all descriptions, Warranted Good.

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Axles, Force Pumps of the most approved construction for Railroad Water Stations and Hydraulic

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THEODOLITES, TRANSIT COMPASSES,
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100 Tons "Columbia" No. 2 Cold Blast Charcoal Iron.

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THE subscribers are prepared to make and execute contracts for Railroad Spikes of a superior quality, manufactured by the New Jersey Iron Company, at Boonton.
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1650 Tons, weighing about 61 lbs. per yard, 40 tons, weighing about 52 lbs. per yard, and 825 tons, weighing about 53½ lbs. per yard, of the latest and most approved patterns of T rail, for sale by
BOORMAN, JOHNSTON & CO.,
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Railroad Iron.

THE Undersigned, Agents for Manufacturers, are prepared to contract to deliver Rails of superior quality, and of any size or pattern, to any ports of discharge in the United States.

COLLINS, VOSE & CO.,
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1,500 Tons weighing 53 lbs. per lineal yard.

500 " " 57 " "
500 " " 56 " "
500 " " 60 & 61 lbs. "

Also 2½ flat rails. All the above being of approved patterns. For sale by

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N.B.—Rails imported on commission, or at a fixed price.

Iron.

Pig Iron, Anthracite and Charcoal; Boiler and Flue Iron, Spring and Blistered Steel, Nail Rods, Best Refined Bar Iron, Railroad Iron, Car Axles, Nails, Stove Castings, Cast Iron Pipes of all sizes, Railway Chairs of approved patterns for sale by

COLEMAN, KELTON & CABELL,
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Railroad Iron.

THE UNDERSIGNED, HAVING made arrangements abroad, are prepared to contract for the delivery of Foreign rails, of approved brands upon the most favorable terms.

They will also make contracts for American rails, made at their Trenton works, from Andover Iron, in whole or in part, as may be agreed upon.

They are prepared to furnish Telegraph, Spring and Market Wire; Braziers and Wire Rods; Rivets and Merchant Bars to order, all made exclusively from Andover Iron. The attention of parties who require iron of the very best quality for special purposes, is respectfully invited.

COOPER & HEWITT,
17 Burling Slip, New York.

February 15, 1850.

Railroad Iron.

THE Undersigned, Agents for Manufacturers, are prepared to contract for the delivery of English, Welsh and Scotch Rails, of any pattern and weight, also for every description of English, Welsh, Scotch, and Swedish Iron, Railway Chairs and Spikes, Rivets, Bolts, Nuts, Washers, Chain Cables, Anchors, Tin Plates, German Spelter, Iron Castings, and every description of Machinery.

WILLIAM BIRD & CO.,
Iron and Tin Plate Merchants,
44 Wall st., New York.

And at 5 Martin's Lane, City, London,
and 140 Buchanan st., Glasgow.

July 27th, 1850.

Railroad Iron.

THE Undersigned are prepared to contract for the delivery of superior make Welsh Railroad Iron of the favorite brand "Aberdare."

JOSEPH BRAMWELL & CO.,
40 91 Wall street.

Glendon Refined Iron.

Round Iron, Band Iron, Hoop Iron,
Square " Flat " Scroll "

Axles, Locomotive Tyres,

Manufactured at the Glendon Mills, East Boston, for
sale by **GEORGE GARDNER & CO.,**

5 Liberty Square, Boston, Mass.
3m37

Sept. 15, 1849.

PATENT HAMMERED RAILROAD, SHIP & BOAT SPIKES.—The Albany Iron Works have always on hand, of their own manufacture, a large assortment of Railroad, Ship and Boat Spikes from 2 to 12 inches in length, and of any form of head. From the excellence of the material always used in their manufacture, and their very general use for rail roads and other purposes in this country, the manufacturers have no hesitation in warranting them fully equal to the best spikes in market, both as to quality and appearance. All orders addressed to the subscribers at the works will be promptly executed.

JOHN F. WINSLOW, Agent.

Albany Iron and Nail Works, Troy, N. Y.
The above Spikes may be had at fact: 17 prices, e
Erastus Corning & Co Albany; Merritt & Co., New
York; E. Pratt & Brother, Baltimore Md.

**LAP—WELDED
WROUGHT IRON TUBES**

FOR

TUBULAR BOILERS,

FROM ONE AND A QUARTER TO SEVEN
INCHES IN DIAMETER.

THE ONLY Tubes of the same quality and manufacture as those so extensively used in England, Scotland, France and Germany, for Locomotive, Marine and other Steam Engine Boilers.

THOMAS PROSSER & SON, Patentees,
29 Platt street, New York.

Railroad Iron.

THE UNDERSIGNED ARE PREPARED TO contract for the delivery of English Railroad Iron of favorite brands, during the Spring. They also receive orders for the importation of Pig, Bar, Sheet, etc. Iron.

THOMAS B. SANDS & CO.,

73 New street,
New York.

February 3, 1849.

Iron Store.

THE Subscribers, having the selling agency of the following named Rolling Mills, viz: Norristown, Rough and Ready, Kensington, Triadelphia, Pottsgrove and Thorndale, can supply Railroad Companies, Merchants and others, at the wholesale mill prices for bars of all sizes, sheets cut to order as large as 58 in. diameter; Railroad Iron, domestic and foreign; Locomotive tire welded to given size; Chairs and Spikes; Iron for shafting, locomotive and general machinery purposes; Cast, Shear, Blister and Spring Steel; Boiler rivets; Copper; Pig iron, etc., etc.

MORRIS, JONES & CO.,

Iron Merchants,
Schuylkill 7th and Market Sts., Philadelphia.
August 16, 1849. 1y33

Railroad Iron.

THE MOUNT SAVAGE IRON WORKS, Alleghany county, Maryland, having recently passed into the hands of new proprietors, are now prepared, with increased facilities, to execute orders for any of the various patterns of Railroad Iron. Communications addressed to either of the subscribers will have prompt attention. **J. F. WINSLOW, President**

Troy, N.Y.

ERASTUS CORNING, Albany

WARREN DELANO, Jr., N.Y.

JOHN M. FORBES, Boston.

ENOCH PRATT, Baltimore, Md

November 6, 1848.

Railroad Iron.

THE SUBSCRIBERS ARE PREPARED TO take orders for Railroad Iron to be made at their Phoenix Iron Works, situated on the Schuylkill River, near this city, and at their Safe Harbor Iron Works, situated in Lancaster County, on the Susquehanna river; which two establishments are now turning out upwards of 1800 tons of finished rails per month.

Companies desirous of contracting will be promptly supplied with rails of any required pattern, and of the very best quality.

REEVES, BUCK & CO.

45 North Water St. Philadelphia;
March 15, 1849.

Tredegar Iron Works.

ROLLING MILL FOUNDRY AND MACHINE SHOPS. The undersigned continues to manufacture at his Works in this city (from best charcoal metal) Bar Iron of every description, embracing—Rounds and Squares, from 1½ to 5 inches diameter. Flats, from 3 to 7 inches, all thicknesses. Bands and Scrolls, all sizes. Boiler plate and Plough Iron, Railroad and Locomotive Axles and Tires. Locomotive Frames, Spikes and Plates. Hoops, Ovals, Half Ovals, Half Rounds, Angle, T, L, and indeed every description of Iron usually manufactured, all of which he warrants to be equal to any made in this country. He also manufactures at his Foundry and Machine Shops all descriptions of Railroad Work, say, Locomotives, Railroad Wheels and Axles complete and ready for the road, Railroad Chairs, etc. Also, Marine and Stationary Engines all sizes, Sugar mills and Engines, Horse mills, and every kind of Machinery usually required for the operations of the country. He has paid particular attention to getting up machinery, etc., for Gold Mine operations, and those in want of such work might find it to their advantage to give him a call.

J. R. ANDERSON.

Richmond, Va., Sept. 10, 1850.

CUT NAILS OF BEST QUALITY, BAR IRON (including Flat Rails) manufactured and for sale by
FISHER, MORGAN & CO.,
75 N. Water St., Philadelphia.

Wheel, Forge and Foundry Iron.

LOCUST GROVE Wheel Iron of great strength and superior chilling property.
Balt. Charcoal Forge Iron, from Patuxent, Curtis Creek and Gunpowder furnaces.
Elkridge Foundry Iron, of superior strength and softness. Anthracite and Charcoal Iron from Pennsylvania and Virginia. Gas and Water Pipes, Lamp Posts from Elkridge furnaces.

LEMMON & GLENN,

6m9 62 Buchanan's Wharf, Baltimore.

S. S. Keyser & Co., IRON WAREHOUSE,

Corner of South and Pratt Streets, BALTIMORE, MD.

Selling Agents for the Rough and Ready Bar Iron and Elk Boiler and Flue Iron Rolling Mills, Sarah and Taylor Furnaces, and Wrightsville Hollow Ware Foundry, and Dealers in Bar and Sheet Iron, and Cast, Sheer, German, Blister, Spring and Electroplated Steel, etc., etc.

Smith & Tyson,

GENERAL COMMISSION MERCHANTS, No. 25 South Charles St., Baltimore, Md.

AGENTS for the Celebrated Columbia Pig Iron, suitable for Car Wheels and Chilled Rolls.
Columbia refined Charcoal Blooms; Refined Charcoal Juniata Billet Iron for Wire; Refined Iron for Bridging, of great strength; Cut Nails, Spikes, and Brads; Railroad Spikes and Wrought Chairs. 22tf

Railroad Iron.

CONTRACTS made by the subscribers, agents for the manufacturers, for the delivery of Railway Iron, at any port in the United States, at fixed prices, and of quality tried and approved for many years, on the oldest railways in this country.

RAYMOND & FULLERTON, 45 Cliff St.

JOHNSON, CAMMELL & Co's Celebrated Cast Steel,

AND ENGINEERING AND MACHINE FILES, which for quality and adaptation to mechanical uses, have been proved superior to any in the United States. Every description of square, octagon, flat and round cast steel, sheet, shovel and railway spring steel, best double and single shear steel, German steel, flat and square, goat stamps, etc. Saw and file steel, and steel to order for any purposes, manufactured at their Cyclops Steel Works Sheffield.

JOHNSON, CAMMELL & CO., 100 William St., New York.

November 23 1849.

Bowling Tire Bars.

40 Best Flange Bars 5½x2 inches, 11 feet long.
40 " " 5½x2 " 7 feet 8 in. long.
40 " Flat " 6x2 " 11 feet long.
40 " " 6x2 " 7 feet 8 in. long.

Now in store and for sale by

RAYMOND & FULLERTON, 45 Cliff street.

IRONDALE PIG METAL, MANUFACTURED and for sale by the Bloomsburg Railroad Iron Co.
LINDLEY FISHER, Treasurer.
75 N. Water St., Philadelphia.

Railroad Iron.

2000 Tons, weighing 58 pounds per lineal yard, of the most approved pattern of T rails, in store and to arrive, for sale by

COLLINS, VOSE & CO., 74 South St.

New York, June 1, 1850.

Railroad Iron.

3,000 TONS C. L. MAKE 63½ lbs. per yard, now landing and to arrive.

Also contracts made for future delivery of above superior make English Iron.

300 Tons Banks Best Iron, Round, Square and Flat.

200 " English Bar " " " "

10 " 9-16 Square Iron for Railroad Spikes.

For sale in lots to suit purchasers by

DAVID W. WETMORE.

New York, March 26, 1850. 3m

WILLIAM JESSOP & SONS' CELEBRATED CAST-STEEL.

The subscribers have on hand, and are constantly receiving from their manufactory.

PARK WORKS, SHEFFIELD,

Double Refined Cast Steel—square, flat and octagon.

Best warranted Cast Steel—square, flat and octagon.

Best double and single Shear Steel—warranted.

Machinery Steel—round.

Best and 2d gy. Sheet Steel—for saws and other purposes.

German Steel—flat and square, "W. I. & S." "Eagle"

and "Goat" stamps.

Genuine "Sykes," L. Blister Steel.

Best English Blister Steel, etc., etc., etc.

All of which are offered for sale on the most favorable terms by

WM. JESSOP & SONS,

91 John street, New York.

Also by their Agents—

Curtis & Hand, 47 Commerce street, Philadelphia.

Alex'r Fullerton & Co., 119 Milk street, Boston.

Stickney & Beatty, South Charles street, Baltimore.

May 6, 1848.

Railroad Iron.

B. O. Railway Tires, Railway Wheels,
Scotch Pig Iron, Tin Plates and Banca Tin,
Muntz Patent Metal Sheathing,
Baltimore Copper.

Contracts for Rails made on behalf of the manufacturers, for delivery at any ports in the United States, at fixed prices.

Bowling Tires and Tire Bars and Scotch Pigs imported to order.

Muntz's Ship-sheathing, and a general stock of Tin Plates and Banca Tin in store, and for sale by

RAYMOND & FULLERTON, 45 Cliff St.

Bowling Iron. Stamped B.O.

Railway Tire Bars Rivet Iron

Locomotive and other Axles Locomotive Frame do

Boiler Plates Bars,

and every other description of this superior Iron.

The subscribers, agents for the sale of Bowling Iron, are prepared to execute orders for importation, especially for railway and machinery uses, with despatch from the manufacturers.

RAYMOND & FULLERTON, 45 Cliff St.

Lovegrove's Patent Cast Iron**Water and Gas Pipes.**

THE Subscriber, the Inventor and Patentee of the

Centrifugal mode of giving form to metallic substances while in a molten state, is preparing to make

Cast Iron Water and Gas Pipes, of any dimensions, at prices much lower than they can be made in the old

manner, and the pipes warranted to stand a pressure of three hundred pounds to the square inch, and to be

soft enough to drill. Steam Engines and all kinds of machinery. Cast Iron Doors and Frames, and Mill

Castings of every description, made to order.

THOMAS LOVEGROVE,

Machinist and Founder,

West Falls Avenue, below Pratt St., Baltimore.

Railroad Iron.

SPIKES.

Wrought Iron CHAIRS, New Pattern.

THE Undersigned continues to contract, as usual, for the above articles. The reputation already acquired for their excellent quality is a guarantee that

strict attention shall continue to be paid to the wants and interests of purchasers.

CHARLES ILLIUS,

20 Beaver St., New York.

Ray's Patent India Rubber Car Springs.

Savannah, Ga., May 22, 1850.

FOWLER M. RAY, Esq.,

Dear Sir: I have no hesitation in saying, after having used on our road your springs and Fuller's, that I consider yours decidedly the best in every particular, and in this opinion I am sustained by all our officers. Fuller's spring has a tendency to split, and also to chafe or abrade by the constant friction on the cast iron plates or discs: and in my opinion is not near so elastic as yours.

Your springs, which have been in use on our road for 12 or 15 months past, and in constant use under both passenger and freight cars, are to all appearances as elastic, sound and good, as when first put in use.

We are now building eighty-five new cars, of which for fifty-sets the springs have been ordered of you.

GEORGE A. ADAMS,

Master Carpenter,

Central Railroad and Banking Co. of Georgia.

Connecticut River Railroad Office, }
Northampton, May 4, 1850. }

E. CRANE, Esq.,

Dear Sir: It is now about two years since I first tried the experiment of using a set of Ray's India-rubber Springs upon one of our merchandise cars, and although the car has been in constant service since that time, I do not on examination find the slightest difference either in the thickness or elasticity of the material.

The same result has followed wherever we have applied them, either for wheel or draw springs on Engines, Tenders or Cars. At present we use no other; either in replacing old springs or building new cars—and I am perfectly satisfied that for economy, durability, safety, and ease of motion, that Ray's India-rubber is the best article for Springs which has been presented to the public.

Yours respectfully, J. HUNT,
Supt. Connecticut River Railroad.

EDWARD CRANE, Esq.,

Dear Sir: Having applied to cars of the Boston and Worcester Railroad Corporation, Ray's Vulcanised Rubber Springs (where they have been in use for some two years last past), I have had occasion to observe their operation, and am free to say in answer to your inquiries, that they retain their elasticity perfectly during all changes of atmospheric temperature: and are in my opinion a most valuable acquisition to Railroad Cars—are not liable to derangement, as is the case with steel springs: while at the same time it costs less to apply them. Respectfully yours,

D. N. PICKERING,
Supt. Motive Power, Boat, & Wor. Railroad.
Boston, April 15th. 1850.

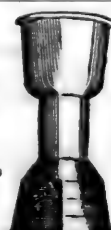
**EMERSON'S**

PATENT

CORRESPONDING VENTILATORS,

For Ships, Steamers, etc.,

Manufactured by



CHILSON, ALLEN, WALKER & CO.,
351 Broadway, New York.

TO RAILROAD COMPANIES, CAR MANUFACTURERS, etc.

THE Undersigned hereby gives public notice, that the Commissioner of Patents, pursuant to his decision in relation thereto, on the 8th day of October, 1850, issued to him a Patent for the sole right to manufacture, and exclusive use of the INDIA RUBBER CAR SPRING, on account of priority of invention of said Spring.

F. M. RAY

New York, Oct. 23, 1850.

RAILROAD CAR MANUFACTORY

TRACY & FALES,

GROVE WORKS, HARTFORD, CONN.

Passage, Freight and all descriptions of

RAILROAD CARS,

AS WELL AS

LOCOMOTIVE TENDERS,

Made to order promptly.

The above is the Largest Car Factory in the Union. In quality of Material, and in Workmanship, Beauty and Good Taste, as well as Strength and Durability, we are determined our work shall be unsurpassed.

JOHN R. TRACY. THOS. J. FALES.

Monument Foundry.

A. & W. DENMEAD & SON,
Corner of North and Monument Sts.,—Baltimore,
HAVING THEIR
IRON FOUNDRY AND MACHINE SHOP
In complete operation, are prepared to execute
faithfully and promptly, orders for
Locomotive or Stationary Steam Engines,
Woolen, Cotton, Flour, Rice, Sugar Grist, or Saw
Mills,
Slide, Hand or Chuck Lathes,
Machinery for cutting all kinds of Gearing.
Hydraulic, Tobacco and other Presses,
Car and Locomotive patent Ring Wheels, war-
ranted,
Bridge and Mill Castings of every description,
Gas and Water Pipes of all sizes, warranted,
Railroad Wheels with best fagotted axle, fur-
nished and fitted up for use, complete
Being provided with Heavy Lathes for Bor-
ing and Turning Screws, Cylinders, etc., we can
furnish them of any pitch, length or pattern.
Old Machinery Renewed or Repaired—and
Estimates for Work in any part of the United States
furnished at short notice.
June 8, 1849.

**RAILROAD CAR
AND COACH TRIMMINGS.**

Doremus & Nixon,
IMPORTERS AND FURNISHERS

HAVE FOR SALE
Plain Garnet Plush. Fig. Garnet Plush (Butterfly pat.
"Crimson" "Crimson" (Elegant.
"Scarlet" " " (Gen. Taylor.

BROCATELLES.
Crimson Silk Brocatelles. Gold and Maroon do.
Gold and Blue " " Brown " "
Silk and Wool " " of every color.

MOQUETTES,
Of elegant designs and colors.
GERMAN CLOTH FOR CAR LININGS.

The most beautiful goods ever shown in this coun-
try, and the subscribers are the sole agents for the sale
of them.

Oil cloths Enamelled with Gold. These goods can be
"Silver" furnished in any
Do. Silver ground velvet printed. dimensions req'd.

CURLED HAIR
Of every description and quality.
JNO. W. A. STRICKLAND, Agent.
New York, 1850. 1yl6

**FOWLER M. RAY'S
Patent India-rubber Railroad
CAR SPRING.**

New York and Erie Railroad Shops.
Piermont, March 26, 1850.

This will certify that from practical experience in
the use of Fowler M. Ray's India rubber Car Springs,
I believe them to be far superior to any others now in
use.

I have never known them to be affected by any
change of temperature, as other Rubber Springs have
been affected on this road.

I am at the present time repairing a Passenger Car
that Mr. Ray and myself mounted with his springs
about two years and eight months since.

The springs are at the present time as perfect, to all
appearances, as when first applied to the car.

Respectfully yours,
HORACE B. GARDNER,
Foreman of the Car Shops.

Supt. Office N.Y. & H. R.R., }
New York, March 8, 1850. }

This is to certify that we have used the Rubber
Springs manufactured by Mr. F. M. Ray for the past
twenty months, "both for Passenger and Freight Car
Springs and Bumpers, and of different sizes" and
have in every case given entire satisfaction, and I con-
sider them the best spring now in use.

M. SLOAT, Supt.

Boston, March 5, 1850.

In answer to your enquiry about India-rubber
Springs, I have to say that we have used them to a
considerable extent on both freight and passenger cars,
and also on several of our tenders; and I am very
well satisfied that they answer all the purposes for
which they are intended. I believe the India-rubber
will soon supersede all other springs for cars and ten-
ders.

Yours truly, **S. M. FELTON,**
Supt. Fitchburg Railroad.

Office New Jersey Railroad Co., }
Jersey City, March 3, 1850. }

FOWLER M. RAY, Esq.,

Dear Sir: In answer to your enquiries respecting
the operation of the Vulcanised Rubber Springs, pur-
chased by our company from you some two years
since, I reply that they are superior to any spring in
use, (that I have either seen or heard of).

The improved form of your spring, consisting of a
solid piece of vulcanised rubber with bands on the out-
side, is far superior to your first form, consisting of
disks of rubber with metallic plates interposed.

The last named form was tried, if you recollect, at a
much earlier period; and then was replaced by your
last form.

I have no hesitation in saying that your springs
have given entire satisfaction, and most cheerfully re-
commend them to railroad companies throughout the
country for the following reasons:

- 1st. The cost is 30 per cent. less.
- 2d. Saving of weight on each car of 8 wheels from
700 to 800 lbs.
- 3d. Less care and attention is required, as they are
not liable to get out of repair.
- 4th. A great saving is secured in the wear and tear
of the cars and rails from their great elasticity.
- 5th. The freedom from noise.
- 6th. There is greater safety in case of accident, as
they cannot be broken.
- 7th. The comfort of passengers is enhanced suffi-
ciently to pay the expense, waiving all the other rea-
sons that I have given.

Should this fail to satisfy any person enquiring, you
are at liberty to refer to me, No. 150 Washington St.,
Jersey City. Yours respectfully,

T. L. SMITH, Supt.

New York, March 11, 1850.

I have used the Patent India-rubber Spring pur-
chased of Mr. Ray, upon the cars of the New York
and New Haven Railroad, and have found them effi-
cient and economical; and when applied to the axles
and draw springs, believe them to be quite equal to
any in use. I have found a combination of these
springs with a steel spring under the transom beam a
very satisfactory arrangement, and am now using this
plan in all new cars.

Yours respectfully,
ROBERT SCHUYLER.

February 25, 1850.

From practical observation of the use of the India-
rubber Car Springs, manufactured and sold by your
company, we are entirely satisfied in their application,
and do not hesitate to recommend them as elastic, du-
rable, requiring no repairs for years, and retaining
their consistency during all extremes of weather. We
have applied them for the past two years, and consid-
er them superior for all railroad purposes.

Yours truly,
OSGOOD BRADLEY, Car Builder, Worcester.
T. & C. WASON, do. Springfield.
DEAN, PACKARD & MILLS, do. do.
DAVENPORT & BRIDGES, do. Cambridgeport.

Office of the New Jersey Railroad Co., }
Jersey City, March 7, 1850. }

This is to certify that we have had Mr. F. M. Ray's
India-rubber Springs in constant use under our cars,
and as Bumper Springs for upwards of two years, and
they have in every way given perfect satisfaction.

The present form of spring we deem far superior to
the form of Disk, having used both forms, although
we have none of those made in Disks at present in use.

We take pleasure in recommending these springs to
all railroad companies.

J. P. JACKSON, Vice Pres.
New Jersey Railroad and Trans. Co.

Roxbury, February 28, 1850.

In compliance with your request, I take great plea-
sure in stating the result of my experience in the use
of "Ray's Patent Vulcanised India-rubber Car and
Engine Springs." We have used them nearly two
years, and never had one fail in any way. The cold
weather does not affect them, as it has other rubber
springs we have used.

With sixteen years' experience as superintendent of
machinery on the Boston and Providence railroad, I
take pleasure in saying that your springs are the best
we ever used, or I ever saw used elsewhere. We have
20 cars rigged with them, of which I can say that the
springs are as good now as when first applied. I put
24 lbs. of the rubber under the forward end of one of
our heaviest engines, taking off 250 lbs. of steel springs
—it has been in use 18 months, and is in as good con-
dition now as when first put under the engine.

Very respectfully yours,
GEO. S. GRIGGS,
Supt. of Machinery, Boston and Prov. R.R.

Fall River, February 2, 1850.

In answer to yours of the 20th ult. I would say that
this company has for some 10 or 12 months past been
using "Ray's India-rubber Springs." We have ap-
plied them to both passenger and freight cars with
uniform success. They have invariably preserved
their elasticity and consistency through all the ex-
tremes of weather; and we are now applying them
whenever the steel spring fails. I am well satisfied
that they are particularly adapted for railroad purposes.

Very respectfully yours,
GEO. HAVEN,
Supt. Fall River Railroad.

Jersey City, March 9, 1850.

This is to certify that the present form of Mr. F.
M. Ray's India-rubber Car Spring I consider far su-
perior to the form of Disk, having used both forms.

I take pleasure in recommending these springs to all
railroad companies.
DAVID H. BAKER,
Foreman of Car Shop of N.J. R.R. & Trans. Co.

Harlem R.R. Depot, }
New York, March 7, 1850. }

This is to certify that we have used Mr. F. M. Ray's
India-rubber Springs for over eighteen months, and
find them to be easy and durable, and recommend them
to railroad companies as being superior to anything we
have tried.

J. M. SMART,
Foreman at 42d St. Depot.

Old Colony Railroad Office,
Boston, March 6, 1850.

EDWARD CRANE, Esq.,
President New England Car Co.,

Dear Sir: In compliance with your request I would
state that the Old Colony Railroad Compy have had
in use upon their road, India-rubber Springs furnish-
ed by your company, for more than eighteen months
past, during which time they have been extensively
used under Passenger and Freight Cars, Locomotive
Tenders, and for Drawer and Buffering Springs, with
the most perfect success. The elasticity and consis-
tency of the Rubber has never been unfavorably affect-
ed by either extremes of heat or cold—and from the
experience which we have had in the use of Rubber
Springs, I think them well adapted for railroad pur-
poses—and therefore we have for some months past
used Rubber almost exclusively, in all places where
springs are required.

Respectfully yours, etc.,
JAS. H. MOORE,
Supt. O. C. Road

Troy, February 27, 1850.

We have been using your India-rubber Car Springs
for nearly two years—and we take pleasure in saying
that in our opinion the rubber has to a certain extent
already, and may eventually entirely supersede all
other Springs for Railroad Car purposes. We now
use it entirely for Draw Springs and Bumpers, con-
sidering it better and lighter than steel.

During our two years' experience in the use of it,
we have not known any to lose their elasticity, or fail
in any way; and we cheerfully recommend the rub-
ber for railroad car springs. Very respectfully,
EATON, GILBERT & CO.

Passenger Car Linings.

THE Advertiser continues to make to order the
Enamelled Car Linings which have been so high-
ly approved the last three years, and are now exclu-
sively used by all the Northern Railroads. No pains
are spared to get out new styles, and adapt them to
the tastes of every consumer.

Orders addressed to **CHARLES STODDER, No.**
75 Kilby street, Boston, will have prompt attention.
March 23, 1850. 2m

India-rubber for Railroad Cos.

RUBBER SPRINGS—Bearing and Buffer—Ful-
ler's Patent—Hose from 1 to 12 inches diameter.
Suction Hose. Steam Packing—from 1-16 to 2 in.
thick. Rubber and Gutta Percha Bands. These ar-
ticles are all warranted to give satisfaction, made un-
der Tyer & Helm's patent, issued January, 1849.—
No lead used in the composition. Will stand much
higher heat than that called "Goodyear's," and is in
all respects better than any in use. Proprietors of rail-
roads do not be overcharged by pretenders.

HORACE H. DAY,
Warehouse 23 Courtlandt street.

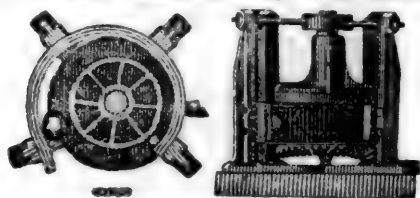
New York, May 21, 1849.

Spikes, Spikes, Spikes.

A NY person wishing a simple and effective Spike
Machine, or a number of them, may be supplied
by addressing **J. W. FLACK,**
March 6, 1850. Troy, N. Y.

MACHINERY.

Henry Burden's Patent Revolving Shingling Machine.



THE Subscriber having recently purchased the right of this machine for the United States, now offers to make transfers of the right to run said machine, or sell to those who may be desirous to purchase the right for one or more of the States.

This machine is now in successful operation in ten or twelve iron works in and about the vicinity of Pittsburgh, also at Phoenixville and Reading, Pa., Covington Iron Works, Md., Troy Rolling Mills, and Troy Iron and Nail Factory, Troy, N. Y., where it has given universal satisfaction.

Its advantages over the ordinary Forge Hammer are numerous: considerable saving in first cost; saving in power; the entire saving of shingler's, or hammerman's wages, as no attendance whatever is necessary, it being entirely self-acting; saving in time from the quantity of work done, as one machine is capable of working the iron from sixty puddling furnaces; saving of waste, as nothing but the scoria is thrown off, and that most effectually; saving of staffs, as none are used or required. The time required to furnish a bloom being only about six seconds, the scoria has no time to set, consequently is got rid of much easier than when allowed to congeal as under the hammer. The iron being discharged from the machine so hot, rolls better and is much easier on the rollers and machinery. The bars roll sounder, and are much better finished. The subscriber feels confident that persons who will examine for themselves the machinery in operation, will find it possesses more advantages than have been enumerated. For further particulars address the subscriber at Troy, N. Y.

P. A. BURDEN.

Railroad Spikes and Wrought Iron Fastenings.

THE TROY IRON AND NAIL FACTORY, exclusive owner of all Henry Burden's Patented Machinery for making Spikes, have facilities for manufacturing large quantities upon short notice, and of a quality unsurpassed.

Wrought Iron Chairs, Clamps, Keys and Bolts for Railroad fastenings, also made to order. A full assortment of Ship and Boat Spikes always on hand.

All orders addressed to the Agent at the Factory will receive immediate attention.

P. A. BURDEN, Agent.

Troy Iron and Nail Factory, Troy, N. Y.

CHILLED RAILROAD WHEELS.—THE UNDERSIGNED are now prepared to manufacture their Improved Corrugated Car Wheels, or Wheels with any form of spokes or discs, by a new process which prevents all strain on the metal, such as is produced in all other chilled wheels, by the manner of casting and cooling. By this new method of manufacture, the hubs of all kinds of wheels may be made whole—that is, without dividing them into sections—thus rendering the expense of banding unnecessary; and the wheels subjected to this process will be much stronger than those of the same size and weight, when made in the ordinary way.

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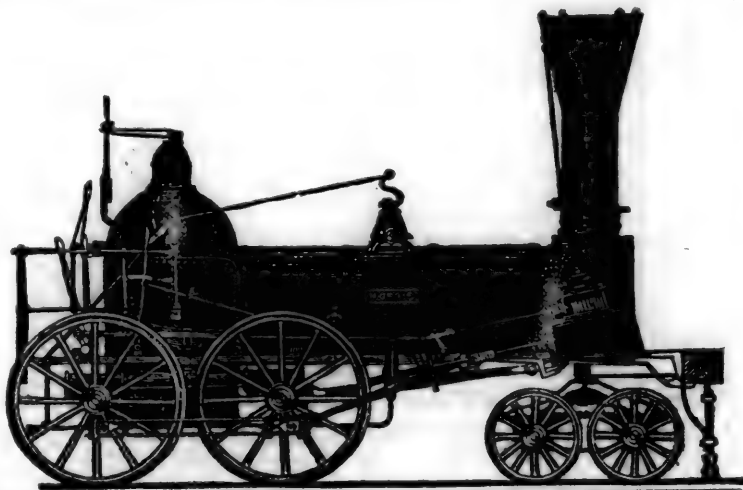
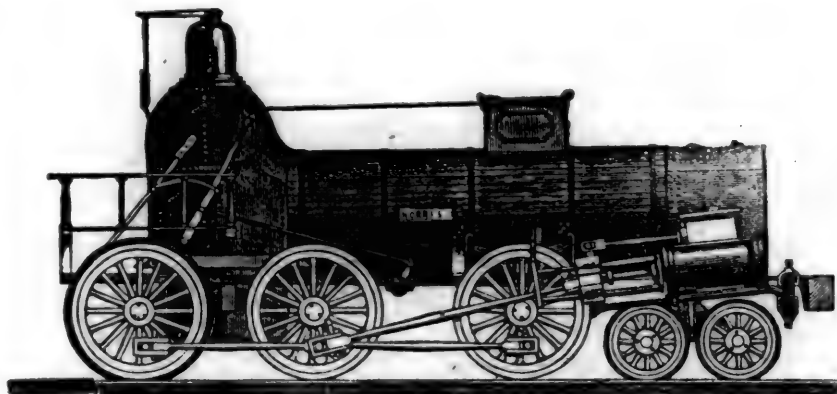
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BUSHHILL, SCHUYLKILL SIXTH-ST., PHILADELPHIA,

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The Premium of the AMERICAN INSTITUTE was awarded to the Etna Safety Fuse at the late Fair held in this city.

November 3, 1849.

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REFINED IRON WIRE OF ALL KINDS, Card, Reed, Cotton-flyer, Annealed, Broom, Buckle, and Spring Wire. Also all kinds of Round, Flat or Oval Wire, best adapted to various machine purposes, annealed and tempered, straightened and cut any length, manufactured and sold by

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Worcester, Mass., May 25, 1849.

AMERICAN RAILROAD JOURNAL.

STEAM NAVIGATION, COMMERCE, MINING, MANUFACTURES.

HENRY V. POOR, Editor.

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GEN. CHAS. T. JAMES, *For Manufactures and the
Mechanic Arts.*

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American Railroad Journal.

PUBLISHED BY J. H. SCHULTZ & Co., 136 NASSAU ST.

Saturday, November 16, 1850.

New York and her Railroads.

New York has not heretofore been regarded as a city largely interested in, nor as enjoying to a great extent the advantages of, railroads. The reason of the indifference manifested on the part of her citizens in a matter considered of so vital importance to some of our leading cities; and Boston in particular, is to be found in the commercial advantages of her position, which without effort secures to her what cost others vast labor to obtain. New York must grow as the whole country grows. It is, and must ever continue, the great commercial mart of this country. Our citizens have too much business constantly on hand, to feel the importance of taking any steps to add to it. They have consequently remained in indifference as to the importance of railroads. Though New York is the commercial money centre of the country, and is aiding

in the construction of a large portion of the lines in progress, her loans are based on railroad securities, and not in the shape of subscriptions to stocks; and are made for the purpose of investment rather than any design to promote the progress of these works.

Though this city feels but little direct interest in railroads, yet every mile of road built in the United States is, to a certain extent, a New York road, as the increased amount of cotton, corn, flour, etc., etc., which they enable the producers to send to market, adds to her business in the same ratio. New York is profited by the public works of every State to a greater amount probably than those immediately engaged in their construction.

Such is her general relation to the country at large. While, as we said before, the great mass of her citizens are not imbued with the internal improvement spirit, she is to possess in a year or more, thanks to the enterprise and energy of a few of her citizens, the most magnificent line of railroads radiating from her that can be found in this country. The influence of these local works is already beginning to be felt, and has already contributed largely to the extraordinary impulse which has been communicated to this great city within a year or two past. She is now reaping the same benefit from these works, that have accomplished so much for Boston. And this benefit will be greater, just in proportion to the greater extent of the lines and the greater fertility and resources of the country traversed. Such is the situation of New York that she can be approached only on one side. Our railroads do not make up so large a part of the coup d'oeil of the city; they do not force themselves so much upon our notice as they do in Boston, where they penetrate the very centre of the city, and cross the most important streets, yet they are accomplishing the same results, and will soon be regarded as of the same importance, as one of the instruments of her growth.

New York has now seven great lines of railroads radiating from her in different directions—the New York and New Haven, Harlem, Hudson River, New York and Erie, New York and Philadelphia, New Jersey Central, and Long Island. The most important of these roads, the New York and Erie, Hudson River, and New Jersey Central, in a business point of view, are still unfinished. The Hudson River road will secure to New York, the Can-

adas, and the eastern part of New England, and must always continue the greatest passenger road in the country, if not in the world. In connection with other roads in progress, it will form an almost straight line between this city and Montreal, the commercial emporium of Canada, and by following the water courses, over the best possible grades. A person has only to look at a map of the country, to be impressed at a glance with the importance of this line, as a great avenue of trade and travel, and as connecting to this city, by the shortest line, the great northern system of natural and artificial communication, and a vast country unsurpassed for its mineral and agricultural resources, filled with populous towns, teeming with every industrious pursuit, and attracting, by its natural beauty, all who have money and time for the recreation of travel. On the northwest, the Erie road, which is now on the eve of completion, is to connect us with the great lakes and the West, by far the most magnificent line of road ever undertaken by any company in this country. On its construction, our communication with the West will be independent of the vicissitudes of the seasons, and will enable us to receive a steady and regular supply from that quarter, of those staples which made up so important a part of the business of this city.

The New Jersey Central is to bring New York into the same intimate connection with the coal mines of Pennsylvania, that is now enjoyed by Philadelphia. An extension of this road to the interior of that State, would in connection with the Pennsylvania Central railroad, form an almost straight line of railroad to Pittsburgh, an event which no very distant day will realise.

New York has been made great by the facilities of water communication which she has enjoyed.—In this she has been immeasurably ahead of all other cities on the continent. She is soon to be as much superior to all others in the extent of her railroads, and in the influences they are calculated to exert. The lines she is now building will connect her with the railroad system of the whole country, and over these lines will flow, as to a common centre, the wealth, the productions, and the trade of every section.

Ohio.

The city of Toledo has subscribed \$50,000 to the Toledo and Cleveland railroad.

Routes Across the Isthmus.

We give this week a portion of a paper, (furnished by Mr. Squier, late Charge d'Affairs to Central America,) to our government, giving a minute account of the topographical features of the country, embracing the Nicaragua route, with a detailed statement of the facilities for the construction of a canal between the two oceans. A large part of public attention will continue to be directed to the projects now before it, for the opening of a communication across the Isthmus, from the influence that they are calculated to exert upon the commerce of the world. The Isthmus of Panama is the key to this commerce, and this is likely to be held by this country, as her citizens hold all the grants of rights of way across it.

The influences that are to flow from opening routes of transportation across it, either by railroad or canal, will by no means be confined to commerce. They are destined to act powerfully upon the political and social condition of the new world. The country through which these routes will run is in many respects the finest in the world, possessing unrivalled commercial advantages, a soil abounding in every kind of agricultural wealth, and with every variety of climate. The whole of this territory is an almost entire forest. With the means of intercourse with it, which we shall soon possess, and with the attractions that it will hold out to the activity and enterprise of the country, we may soon expect to see a large emigration thither in view of a permanent settlement there. Mexico will thus be virtually surrounded by the Anglo-Saxon race.—What shall prevent these coils from being drawn closer and closer, till they shall reach the heart of that country? Will not these movements result in giving this race a foothold on another part of this continent, where it shall expand itself into dimensions which we now behold in a more northern latitude? Who can say what is before us?

Subjoined is the account of Mr. Squier.

TOPOGRAPHICAL FEATURES OF THE COUNTRY.

Before proceeding further it is necessary to refer briefly to the geographical and topographical features of the State of Nicaragua. These are somewhat remarkable. If an accurate map of Central America existed, it would exhibit in this state a separation of the great chain of the Cordilleras into two divergent ranges, of less general height than the great ridge itself, and having occasional partial interruptions. This divergence takes place in the northern department of Sogovia, one branch extending due southeast toward the Atlantic. Its outposts come down to the very shore, and form the prominent landmarks upon that coast. The range itself intersects the San Juan river about fifty miles above its mouth. Upon its northern base, and nearly parallel to it, flows a large and long stream, the Rio Escondido, better known in the maps as "Bluefields river." All the streams upon the other side of the range fall into lakes Managua and Nicaragua, or into the San Juan river. This range resumes its course upon the southern shore of the San Juan, but now bears nearly due south, connecting with the Pacific range in the elevated regions of Costa Rica.

The Pacific range follows the general direction of the coast, sometimes rising into lofty volcanic cones, but generally sustaining the character of a high ridge, in places subsiding into low hills and plains. This range preserves a nearly uniform distance from the sea of from ten to twenty miles; consequently there are no considerable streams falling into the Pacific for the extent which it continues. It unites, as I have already said, with the eastern range in Costa Rica. The course of this range seems to have been the line of volcanic action, and extinct craters and beds of lava are to be met at short intervals throughout its length. The lofty cones of the Viejo, Santa Clara, Acosusco, Momotombo, Momobacho and Ometepe, not to

mention many others, may be regarded as belonging to this range, and are prominent landmarks, and form remarkable features in the landscape.

The two ranges of the Cordilleras, here referred to, form, with their slopes, a great interior basin, not far from 300 miles long by 150 broad, consisting in great part of broad, beautiful and fertile plains. The waters of this wide region fall into the lakes already named, of which the San Juan river is the only outlet. Many of the streams flowing into these lakes, especially from the north, are of considerable size, and furnish a supply of water which could not be sensibly affected by drains for artificial purposes.

The lake Managua approaches at the nearest point, to within four or five leagues of the Pacific, from which it is separated on the south by the range of hills already described, but between its northern extremity and the sea there is only the broad and magnificent plain of Leon, gradually rising, for a distance of 2,725 yards, to an elevation of 55 feet 6 inches, and then subsiding gradually to the ocean.

There is every reason to believe that this statement is not far from correct; and, if so, it must be obvious that it will be entirely practicable to carry a canal from the lake, which will form the summit level, to the ocean, especially as the earth at a short depth is sufficiently firm to sustain itself without the usual guards. This is shown from the fact that the wells of the plain of Leon, which have often a depth of from 80 to 100 feet, do not require the use of artificial means to prevent the earth from falling inwards.

Section from Pacific to Lake Managua—Tamarinda Line.—The first line from the lake of Managua to the sea, at the port of the Tamarinda, is considerably shorter than any other, not exceeding fifteen miles in length. But the water of the lake, upon its northwestern shore, is shallow. It was sounded by myself and Dr. Livingston, in July, 1849. It deepened regularly from the shore to the distance of one mile and a quarter, where it attained five fathoms; after that it deepened rapidly to ten and fifteen fathoms, which is, as I was informed by the boatmen, the average depth of the central portion of the lake. The country between these points so far as could be ascertained, it being covered with forests, offers no insuperable obstacle to a canal.—The port itself is small, but well protected, with a considerable stream of fresh water flowing into it. Vessels of 160 tons have frequently entered to load Brazil wood. There is no town or village upon it, and it seems to have escaped general notice. It is said to have all requisite depth for large vessels.

Section from Pacific to Lake Managua—Realejo Line.—The second line is that to the well known and excellent port of Realejo, which is properly an estero, formed by the junction of the Dona Paula and Realejo rivers, and protected on the side of the sea by the islands of Cardon and Aserradores, and a bluff of the main land. It is safe and commodious, and the water is good, ranging from three and four to eight and nine fathoms. The volcano of the Viejo, lifting its cone upwards of 6,000 feet above the sea, to the northeastward of the port, forms an unmistakable landmark for the mariner, long before any other part of the coast is visible. This line, starting from the nearest practicable point of lake Managua, cannot fall short of forty five or fifty miles in length. It is said that the Dona Paula might be made use of for a considerable distance—so far as the tide flows; but that can only be determined by actual survey. I can discover no reason why this route could not be advantageously pursued. It has the present advantage of passing thro' the most populous and best cultivated part of the country, and terminating at a point already well known. There is no stream upon this line which, as has been supposed by Louis Napoleon, and some other writers on this subject, can be made available for supplying this section of the proposed canal with water. The "Rio Tosta," of which they speak, (by which, from its described position, it is supposed that the Rio Telica is meant, for no stream known as the Rio Tosta exists) was formerly a stream of some size, but never furnished a quantity of water sufficient to supply a canal. The local geography of the plain of Leon is little known to its inhabitants; and as the roads are hemmed in by impenetrable forests, it is impossible for the travel-

ler to inform himself of the minor topographical features of the country. The Rio Telica empties into the estero of Realejo, and it may possibly be made to answer a useful purpose. I have crossed it at many points where it has (as it has for nearly its entire length) the character of a huge natural canal, from sixty to ninety feet deep by perhaps one hundred and fifty or two hundred yards broad at the top, with steep banks, for the most part of a friable substratum of rock or compact earth. And as, at its source, it is not more than ten miles distant from lake Managua, it is not improbable that, by proper cuttings, the waters of the lake might be brought into it, and, after the necessary level is attained, the bed of the stream might be used from that point to the sea, securing the necessary depth of water by locks or dams. If this suggestion is well founded, the principal part of the estimated excavation of this section of the canal may be avoided. In any event the cutting would not, with the aids furnished by this mechanical age, be an object to deter the engineer. We have examples of much more serious undertakings of this character. In the canal from Arles to Bouc the table land has been cut through to the extent of two thousand two hundred and eighty nine yards, the extreme depth being from one hundred and thirty to one hundred and sixty two feet. The deepest cutting required here, in order to furnish a depth of twenty five feet of water in the canal, or, in other words, to that depth below the level of the lake, would be eighty one feet. I need hardly add that the lake of Managua must supply the water requisite for the use of the canal, from its shores to the sea, as there are no reservoirs or streams of magnitude upon this line.

Section from Pacific to Lake Managua—line of the Estero Real.—There is still another route to which public attention has never been generally directed, but which, if feasible, of which I have no doubt, offers greater advantages than either of the others just named, viz., from the northern point of Lake Managua via the Estero Real to the Gulf of Fonseca, or Conchagua. The upper part of Lake Managua is divided into two large bays by a vast promontory or peninsula, at the extreme point of which stands the giant volcano of Momotombo.—Between this volcano and that of the Viejo, to the northeast of Realejo, running nearly east and west is a chain of volcanoes, presenting, probably, in a short distance, a greater number of extinct craters and more evidences of volcanic action than any other equal extent of the continent.—This chain is isolated, and nearly at right angles to the general course of the great mountain ranges. Upon the south is the magnificent plain of Leon, bounded only by the sea, and upon the north is also another great plain, the "Llano del Conejo," bounded by the auriferous hills of Segovia. This plain extends from the northern bay of lake Managua to the gulf of Conchagua, which is equalled only by that of San Francisco, and may be described as a grand harbor, in which all the vessels in the world might ride in entire security. It much resembles that of San Francisco, in position and form; the entrance from the sea is, however, broader. Its entire length within the land is not far from 100 miles, and its breadth from 30 to 60. The three states of San Salvador, Nicaragua, and Honduras, have ports upon it. In respect to trade, the principal port on the main land is that of La Union, in San Salvador. All the adjacent coasts are of unbounded fertility, and possess an unlimited supply of timber. The sides of the mountains, particularly the volcano of San Miguel, are covered with oak and pine, suitable for building and repairing ships. Coal occurs in abundance about 60 miles from the port of La Union, on the banks of the Rio Lempa, the roads to the beds leading through a level country. The bay embraces several islands of considerable size and beauty, surrounded by water, of such depth as to enable vessels of the largest class to approach close in shore. The most important of these, from the circumstance of its size and the fact that it commands and is the key to the entire bay, is the island of Tigre, belonging to Honduras.

Into the southern extremity of the Gulf of Conchagua empties a considerable stream or estuary, called the Estero Real, up which the tide flows for many miles. Its course, for a considerable dis-

tance, is near the base of the volcanic range which I have mentioned, and in ascending it the voyager takes a direct course towards the northern and deepest bay of Lake Managua. There is a sand bar at the entrance of the Estero, upon which, at low tide, there is but two and a half or three fathoms of water. The tide rises about ten feet, and, with some artificial improvements, it is said the bar could be made passable at all times. The bar passed, the Estero deepens to six and ten fathoms, and preserves a uniform width of from three hundred to four hundred yards. It is one of the most beautiful natural canals that can be imagined; the banks are lined with mangroves, and it has a dense background of other trees. Sir Edward Belcher, who was here in 1838, went thirty miles up the Estero in a vessel drawing ten feet of water. He says:—"To day we started with the Starling and other boats to explore the Estero Real, which I had been given to understand was navigable for sixty miles; in which case, from what I saw of its course in my visit to the Viejo, it must nearly communicate with the Lake of Managua. After considerable labor we succeeded in carrying the Starling thirty miles from its mouth, and might easily have gone further had the wind permitted, but the prevailing strong winds rendered the toil of towing too heavy. We ascended a small hill about a mile below our extreme position, from which angles were taken to all the commanding peaks. From that survey, added to what I remarked from the summit of the Viejo, I am satisfied that the stream could be followed many miles further, and I have not the slightest doubt, is fed very near the Lake Managua. I saw the mountains beyond the Lake on its eastern side, and no land higher than the intervening trees occurred. This, therefore, would be the most advantageous line for a canal, which, by entire lake navigation, might be connected with the interior of the states of San Salvador, Honduras, Nicaragua, and extend to the Atlantic. Thirty navigable miles for vessels drawing ten feet we can vouch for, and the natives and residents assert sixty (30?) more!" From the course of the Estero, and the distance it is known to extend, it probably would not require a canal of more than twenty to twenty-five miles in length to connect its navigable waters with those of Lake Managua, in which case there would be a saving over the Realejo line, beside having the western terminus of the great work in the magnificent bay which I have just described, where every facility is afforded for victualling, repairing, &c., and where a local trade of vast importance in sugar, cotton, indigo, cocoa and coffee would soon spring up.

It may, therefore, be safely asserted that a passage from the Lake of Managua to the sea is entirely feasible, and it only remains to determine which of the routes here indicated offers the greatest advantages.

Lake of Managua.—The Lake of Managua is a fine body of water, and of much larger size than has heretofore been represented. It is certainly not far from fifty to sixty miles in length, by thirty or thirty five in greatest breadth, and ranges from nine to ten and fifteen, and even thirty fathoms in depth. Some considerable streams flow into the lake from the direction of Segovia, and the level of water undergoes very slight change with the different seasons.

With the aid of steamers, and with proper deepening near the shores, there would probably exist no difficulty in making the passage of this lake with the largest vessels. Its sole outlet is the River Tipitapa, or Panalya, which connects it with the Lake of Nicaragua. The distance between the two lakes is about 18 miles, and the difference of level is stated to be 28 feet. The whole of this fall is comprised within the first four miles from Lake Managua. The river below assumes the character of an estuary of Lake Nicaragua, with a wide channel, and from six to fifteen feet of water. The estate of Pasquel, at the head of this estuary, is the limit of navigation. Above for a mile and a half, to "Pasco Chico," the bed of the river is full of large and isolated rocks, resting upon a bed of rock, which seems to be calcareous breccia, but, singularly enough, intermixed with fragments of lava, as well as various granite stones, jasper and other materials. Beyond "Pasco Chico," the bed, or rather the former bed of the river, (for there is

now no water here except what flows from springs or is deposited in large pools in the depressions of the rock by the rains,) is the same solid breccia, worn into basins and fantastic "pot-holes" by the water. Within one mile of the Lake of Managua is the falls of Tipitapa, opposite the little village of that name. It is a ledge of the same rock above described, and is from twelve to fifteen feet in height. The former bed of the stream is here not less than four hundred feet in width.

From the falls to the lake, the ancient bed is wide but shallow, and is now covered with grass and bushes, resembling a neglected pasture. At the time of my visit (September, 1849) at the height of the so-called rainy season, no water flowed through it, and so far as I could learn, none had flowed there for years. I can, however, readily believe that in an extremely wet season a small quantity may find its way through this channel, and over the falls. It is, nevertheless, very evident that no considerable body of water ever passed here. There is an arm of the lake which projects down the old bed for three or four hundred yards, but the water is only two or three feet deep, with an equal depth of soft grey mud, the dwelling place of numerous alligators, with reedy shores thronged with every variety of water birds. The water of Lake Managua, near the so-called outlet, is not deep, and the channel, in order to admit of the passage of large vessels, would probably require to be well dredged, if not protected by parallel piers. At the distance of about three fourths of a mile from the shore, I found, by actual measurement, that the water did not exceed two fathoms in depth. No great obstruction to building the proposed canal exists in the section between the two lakes. The rock is so soft and friable that a channel can easily be opened from Lake Managua to the falls. Beyond this the banks are high for four miles, forming a natural canal, which only needs to be properly dammed at its lower extremity to furnish a body of water adequate to every purpose of navigation. Locks would then be required to reach the estuary from the Lake of Nicaragua at Pasquel. From this point to the Lake I conceive may prove the most difficult part of this section, although apparently the easiest. Where the bottom is earth or mud, the desirable depth of water may be secured by dredging; but where it is rock, as it certainly is, near its upper extremity, some difficult excavations will be required. The banks downward are so low as to prohibit assistance from dams, except by diking the shores.

To be continued.

Free Banking in New York.

We copy from Thompson's Bank Note Reporter the following—

Synopsis of the Bank Laws of the State of New York.—The owner of bank stock is individually liable for the debts of the bank, to an amount equal to the par value of the stock. The fact that the stock stands in the name of another person does not relieve from liability the real owner. Non-residents are equally liable with citizens of our own state. Any class of creditors can claim the benefits of this liability.

Safety fund banks can take 7 per cent discount from all paper having over 63 days to run, but only 6 per cent from shorter paper.

Free banks can take 7 per cent discount from all paper, without reference to time.

The circulating notes of the safety fund banks are not required to be secured by a deposit with the Comptroller. The circulating notes of the free banks are secured as follows:

- 1st. All New York state stocks.
- 2d. Half N. Y. stocks and half U. S. stocks.
- 3d. Half N. Y. stock and half bonds and mortgages.
- 4th. Half N. Y. stock, and portions of U. States stocks and bonds and mortgages.

The bonds and mortgages must bear 7 per cent interest, and must not exceed in amount two-fifths the value of the property, exclusive of buildings. The property must be unincumbered and productive.

The stocks must be six per cent, or an amount will be deducted which will leave in the Comptroller's hand a security equal to a six per cent stock.

Joint stock banks can organize on not less than \$100,000 capital, and must deposit with the Comptroller not less than \$100,000 of securities for circulating notes.

Individual bankers are not required to have any given amount of capital, but must commence on not less than \$50,000 of securities deposited for circulating notes.

All banks and bankers are required to provide for the redemption of their circulating notes, in New York city or Albany, at a half of one per cent discount.

Constitutional Prohibitions and Requirements.—The Legislature cannot grant any special charters for banking purposes.

The Legislature cannot legalize a suspension of specie payments.

All circulating notes must be registered by the authority of the state, and ample security taken for their redemption in specie.

Holders of bank notes are preferred creditors.

We give these leading features of our bank laws for a double object:—

- 1st. That all parties interested may know their rights and liabilities.
- 2d. That our readers in the Western States, when the question of banks is under discussion, may have a comprehensive outline of our laws.

Traffic of English Railroads.

The aggregate amount of traffic on railways in the United Kingdom during the current year, shows a very considerable increase over the corresponding period of 1849. The published total receipts from the 1st of January to the 29th of September, 1850, amounted to £9,525,707; corresponding period of 1849 to £8,275,679; showing an increase of £1,250,028 for that period. The receipts during the first quarter of 1850 amounted to £2,613,237; second quarter to £3,214,903; and third quarter to £3,697,567, being an increase over the corresponding periods in 1849 of £283,001 in the first quarter; £422,301 in the second; and £544,726 in the third quarter.

A comparison of the traffic returns for corresponding periods of former years also shows the increase to be progressive.

The length of railway in operation over which the traffic was carried in 1850, was 6,075 miles; the latter include 150 miles of canal, the receipts on which are included in the railway traffic returns.

The average traffic receipts per mile indicate the effects of opening so many miles of new railway. The receipts per mile in 1847 exceeded those of 1850 by £491; in 1848, by £256; and in 1849, by £57.—*Railway Record.*

Illinois.

Grant of Lands of the Central Railroad.

As the recent grant of lands by the general government to this State in aid of the above work is a matter of general interest to the railroad community, and as it may connect itself more or less intimately with other projects, both in that and other States, we give below an abstract of the original charter of this company, together with the amendatory act, and the release of the Cairo City and Canal company. We have presented everything material to a full understanding of the relation sustained by this company to the grant, and also to the State.

How the State will avail itself of this grant remains to be seen. The release is conditional, and the State may not accept it, but we presume that it will. Whether the above company will be allowed to build the road under a modified charter, or whether new companies will be organized for this purpose, is a mere matter of conjecture. We hope at any rate that the money which may be obtained for the lands granted will not follow in the wake of all that the State has formerly had at her disposal.

The first section provides that the president and directors of the Cairo City and Canal company, (incorporated by the state of Illinois) and their successors in office, be, and they are hereby, made a

body corporate and politic, under the name and style of the "Great Western Railway Company," and the said corporation are hereby authorised and empowered to locate, construct, and finally complete, a railroad, commencing at the city of Cairo, in Alexander county, in Illinois, and thence north, by way of Vandalia, Shelbyville, Decatur, and Bloomington, to a point on the Illinois river at or near the termination of the Illinois and Michigan Canal, in such manner and form as they shall deem most expedient.

The second section provides that the immediate direction and government of the affairs of said company shall be vested in a board of not less than five directors, who shall be chosen by the members of the Cairo City and Canal company, at the annual meeting, as provided by the ninth section of the act of its incorporation, and who shall hold their offices until others are duly elected and qualified to take their places as directors: * Provided, That the first board of directors to be elected under the provisions of this section may be chosen at any time before said annual meeting.

The third section provides that the president and directors for the time being are hereby authorised and empowered, by themselves or their agents, to execute all the powers herein granted to the company, for the purpose of locating, constructing and completing said railroad, and for the transportation of persons, goods and merchandise; and all such other powers and authority for the management of the affairs of the company not heretofore granted, as may be necessary and proper to carry into effect the objects of this company, for the use of the road, for the transportation of persons, goods and merchandise.

The ninth section provides that the capital or funds which may be required and are necessary from time to time for the objects authorised by this act, shall be obtained by the sale of bonds or obligations, to be issued in the name of and upon the sole security of the whole property, estate and income of the Great Western railway company, and which indebtedness may be made payable at such times and places, and with such rates of interest, and in such form and manner, as the directors of the said company for the time being shall deem proper and expedient.

The sixteenth section provides that whenever the said company shall have paid and discharged all its obligations and indebtedness, assumed or entered into under the provisions of this act, that then, and forever thereafter the said company shall be held to pay to the treasurer of the state of Illinois, for the use of the state, one fourth of the whole net income annually received from the road herein authorised to be made.

The above charter having been forfeited by failure to comply with its provisions, an act was passed February 10th, 1849, reviving under certain stipulations the privileges before granted.

The first section of this act provides that the president and directors of the Cairo City and Canal company, under the name and style of the "Great Western Railway Company," chartered March 6th, 1843, and that Wm. F. Thornton, Willis Allen, Thomas G. C. Davis, (and 26 others) be associates with said company in the construction of said railroad, and are hereby empowered and reinstated, with all the powers and privileges contained in said act of incorporation, and are also subject to all the restrictions contained in said act—the act in force March 3d, 1845, which repealed the charter of said company, to the contrary notwithstanding; and are also subject to such other restrictions and privileges as are hereinafter granted and provided.

The second section provides that said company are hereby authorised and empowered to construct, continue, and extend, said railroad described in said charter, from the termination set forth in said charter, at or near the termination of the Illinois

and Michigan canal, to the city of Chicago in Cook county, Illinois, in such manner, place and form, as they shall deem most expedient, but in strict conformity to all the forms, contents, obligations, restrictions, powers and privileges, contained in said act of incorporation.

The third section provides that the right of way that the state may have attained, together with all the work and surveying done at the expense of the state, and materials connected with said road, lying between the termination of the Illinois and Michigan canal and Cairo city, are hereby granted to said company upon conditions as follows: Said company shall take possession of said road within two years from the passage of this act, and as far as practicable preserve the same from injury and dilapidation; and said company shall within two years from the passage of this act, expend one hundred thousand dollars in the construction of said road, and two hundred thousand dollars for each year thereafter, until said road shall have been completed from the city of Cairo to the city of Chicago.

The fourth section provides that the governor of the state of Illinois is hereby authorised and empowered to contract with, and agree to hold in trust for the use and benefit of, said Great Western railway company, whatever lands may be donated, or thereunto secured to the state of Illinois by the general government, to aid in the completion of the Central or Great Western railroad, from Cairo to Chicago, subject to the conditions and provisions of the bill granting the lands by Congress; and the said company is hereby authorised to receive, hold and dispose of any and all lands secured to said company by donation, preemption or otherwise, subject however to the provisions of the eighteenth section of this charter.

In consequence of the provisions in this charter, securing to the Cairo City and Canal company such aid as might be granted by the general government to the above road, the Illinois delegation in Congress, or perhaps we should say, Mr. Douglass, refused to assist in getting any aid from Congress, unless the same should inure to the benefit of the state. To remove this obstacle, the Cairo City and Canal company, through Mr. Holbrook, its president, executed the following instrument of release of the franchises or privileges granted under the above acts.

"In consideration of the stipulations and conditions hereinafter stated, the Cairo City and Canal company, by their president, hereto duly authorised by a resolution of the stockholders of said company at a meeting held on the 24th day of December, 1846, hereby release and surrender to the State of Illinois the charter of the Great Western railroad company, and all acts or parts of acts, supplemental or amendatory thereof, or relating to the Central railroad company, together with all the rights and privileges of any kind granted by said charter, or acts, as fully and completely as if the same had never been passed by the legislature; on the following conditions, viz: 1st, That the legislature of said state shall, within the period of ten years from the 1st of January, 1850, construct and finally complete, or cause to be constructed and completed, a railroad from Cairo to Chicago, and that the southern terminus of said road shall be the city of Cairo. 2d, That the legislature of said state shall, during its next session, elect whether to accept or decline their release upon the condition herein stated. 3d, That until said state, through their legislature, shall have made their election, this company may, with the approbation of the governor of the state, proceed in the construction of said road, and if said charter shall be released as aforesaid, to said state of Illinois, the said state shall within one year from the time of said election, refund to this company the amount which, between that period and the present time, shall have been expended in the construction of said road, with six per cent. interest thereon, and shall assume all bona fide contracts hereafter made by this company, in the construction of the same, which shall have been previously approved by the governor of said state.

"In witness whereof, the said company have caused their instrument to be executed by the president, authorised as aforesaid, and their corporate seal to be hereto affixed, at the city of New York, this 24th day of December, A. D. 1849.

The Cairo and Canal Co.,
by their President,
D. B. HOLBROOK.

In presence of
J. R. FOY and ELIHU TOWNSEND."

Internal Improvements of the State of New York.

A SKETCH OF THE RISE, PROGRESS, AND PRESENT CONDITION OF INTERNAL IMPROVEMENTS IN THE STATE OF NEW YORK.

Continued from page 644.

With all the advantages of the Virginia route, so strongly stated by Washington and Jefferson, ten or fifteen years before the commencement of the present century, and which were again enforced by an address by Chief Justice Marshall in 1832, why is it that the State of New York has been enabled to construct a canal, uniting the waters of the Atlantic and the lakes, which has furnished a sufficient amount of revenue for its own maintenance, and to reimburse in twenty years the principal borrowed for its construction with interest thereon, whilst the route which, in the judgment of the eminent men before named, possessed decided advantages over that of New York, has not progressed so far as to form a connection with the waters which fall into the Ohio?

Joshua Forman, the author of the Legislative resolution of 1808, in favor of a canal from the Hudson to Lake Erie, states, that when he called the attention of Mr. Jefferson to the subject in the following year, the President replied, "it is a very fine project, and may be executed a century hence." In a letter to Governor Clinton, dated in December, 1822, Mr. Jefferson says he does not recollect the conversation, but has no doubt the statement made is correct, "for that, I know, was my opinion; and many, I dare say, still think with me, that New York has anticipated, by a full century, the ordinary progress of improvement." And he adds:—"This great work suggests a question, both curious and difficult, as to the comparative capability of nations to execute great enterprises. It is not from greater surplus of produce, after supplying their own wants, for in this New York is not beyond some other states; is it from other sources of industry additional to her produce? This may be;—or is it a moral superiority?—a sounder calculating mind, as to the most profitable employment of surplus, by improvement of capital, instead of useless consumption? I should lean to this latter hypothesis, were I disposed to puzzle myself with such investigations; but at the age of eighty, it would be an idle labor, which I leave to the generation which is to see and feel its effects."

Since Mr. Jefferson's letter was written, the new State of Ohio, and the old state of Massachusetts, have furnished abundant proofs of the same energy and "capability to execute great enterprises," which excited his wonder and admiration in regard to the Erie Canal. The young state of Ohio, commencing with a population of about 750,000 in 1825, has constructed 800 miles of canals, at an aggregate cost of nearly \$20,000,000, and from 300 to 400 miles of railroads, at a cost of \$5,000,000 to \$6,000,000; while the people of Massachusetts, numbering 603,000 in 1830, have, since that time, constructed 1,000 miles of railroads, at a cost of \$50,000,000.

The expenditure of \$6,000,000 or \$7,000,000 for uniting the lakes and the ocean, was not regarded by the canal commissioners of New York, in their report of 1812, as a matter of very serious consideration to a million of people, possessed of the fertile lands, and enjoying the fine climate of New York. And in the mere matter of creating debt and making expenditures in the prosecution of internal improvements, other states have exhibited much more boldness than New York. But in furnishing the earliest, safest, and cheapest channel of communication with that "rising world" beyond the mountains and the lakes, to which General Washington looked with so much solicitude, the timely efforts of this state, and the importance of the Erie Canal, can scarcely be overrated. It at once opened facilities to the person seeking a new home, which were equivalent to bringing the fertile lands of "the ter-

* SECTION 9. The annual meeting of the members of the Cairo City and Canal company shall be held on the first Monday in November, in each year, at Cairo, or such other place as the directors for the time being may appoint, at which meeting the directors shall be chosen by ballot, each proprietor being entitled to as many votes as he holds shares.

erty northwest of Ohio" into "the Genesee country," and offering them to him at ten shillings an acre. The influence of this great highway, in populating the west and increasing its productive power, can hardly be subjected to computation.—Some estimate of the effect of this emigration on the trade of the Erie Canal, may be made from the increase of tolls and tonnage at its western termination. The sum paid for toll at Buffalo and Black Rock, including the contributions from Erie and Chataque counties, for the first three years after the canal was navigable, averaged \$32,823 99, for each year. The average for the last three years, is \$1,034,674, for each year. The quantity of tonnage coming from states and territories west of Buffalo, has increased from nothing in 1825 to 36,277 tons in 1836, and 396,512 in 1846, to 535,086 tons in 1849, exclusive of 233,583 tons coming from the Western States and Canada, in the latter year, by way of Oswego. In twenty-three years, a trade has grown up between New York and the western country, which brought to the Erie and Oswego Canals, in the navigation season of 1849, 768,669 tons of products, valued at \$26,713,796.

The success of the Erie Canal, in attracting the trade of the west, and in accumulating revenue, has been unprecedented. Its great natural rivals, the Mississippi and the St. Lawrence, with all the improvements which have been made in their navigation by steamboats, locks and otherwise, have not, to any considerable extent, diverted the trade from any portion of the region around the lakes, which in the original estimates was counted on to seek a market through the Erie Canal—while every new channel of transportation communicating within the basin of the great lakes, has had the effect of increasing its tonnage and its revenue.

When the state of Ohio, in 1832-3, completed a canal of 309 miles, extending from Cleveland, at the mouth of the Cuyahoga, to the Ohio river; and when subsequently the Pennsylvania and Ohio Canal was made, connecting Pittsburg with the first named canal at Akron, [the latter route being 300 miles less to Philadelphia than to New York, and open six weeks earlier] it was anticipated that a large portion of the products of Ohio would be diverted from the Erie Canal, and pass down to New Orleans, or through the Pennsylvania improvements to Philadelphia. These anticipations may have been partially realized, but not to such an extent as to have made any impression on the Erie Canal. It is only necessary to refer to the transportation of wheat and flour, to show the effect of the Ohio Canal on the trade of Lake Erie. Of the wheat and flour transported on the Ohio Canal for six years preceding 1843,* Cleveland, on Lake Erie, received of wheat, 8,325,032 bushels; Portsmouth, on the Ohio river, 4,193 bushels; Cleveland received of flour, 3,199,542 barrels; Portsmouth, 149,645 barrels. Calling five bushels of wheat equal to a barrel of flour, and the comparison will show 3,864,546 barrels of flour brought to the lake, against 150,483 taken to the Ohio river. In the year 1847, there arrived at Cleveland, on the Ohio Canal, 187,601 tons of products, and at Portsmouth 27,054 tons; of wheat and flour, there came to Cleveland 89,886 tons, and to the Ohio river, at Portsmouth, 4,426 tons. The proportion of wheat and flour is as 20 to 1.

At the same time, the opening of the Ohio and Pennsylvania Canals to Lake Erie has brought to its shores the iron manufactures of Pittsburg, and sugar, molasses, coffee, and some other kinds of merchandise from New Orleans, which before came from New York. The Canal Board, in July, 1845, reduced the toll on all these articles from 18 to 10 mills on a ton per mile, going from tide water. These reductions were made as much because it was considered just and expedient to discriminate between the rates on heavy and light merchandise, as to counteract, if practicable, the effects of this competition with the trade of New York.

Since the opening of the Ohio Canals, the extension of the Indiana Canal to the grain growing valley of the Wabash, and the connection of Lake Michigan with the Illinois river, the contributions to the Erie Canal, in the products of the forest and of agriculture, have been vastly increased. The single article of corn, brought from other states by

way of Buffalo, Black Rock, and Oswego, has increased from 33,000 bushels in 1845, to 3,581,674 bushels in 1849.

The improvements in the navigation of the St. Lawrence have been perfected, and afford the most ample facilities to the navigation of that river.—And yet, instead of drawing the western trade to Montreal, the people of Upper Canada are availing themselves of drawback laws, enacted by the Congress of the United States in 1845 and 1846, to pass through our canals with merchandise imported in original packages by way of New York, or from Canada to be exported from the Atlantic ports, and Congress has been applied to in their behalf for such a modification of the tariff as will enable them to make New York the port for the shipment of their produce, as well as for the entry and export of their merchandise. Thus using the New York canals instead of the St. Lawrence and its improvements.

All these facts lead to the conclusion that the route of the Erie Canal possesses some peculiar advantage over all the rival routes, natural and artificial, from the lakes to the Atlantic. The state of Pennsylvania, at a cost double that of the Erie Canal, completed her main line of improvements to Pittsburg, connecting at that point with the trade of the valley of the Ohio for 800 miles, by steamboat navigation, and with Lake Erie at Toledo, Cleveland, and Erie, by canal boats, and yet the tolls paid, and the tonnage cleared on the canal at Pittsburg, falls far below the canal business at Buffalo. Philadelphia is several hundred miles nearer the centre of Ohio than New York, yet the wheat, and flour, and corn, all heavy products, take the circuitous route to market. Why is this? Is it not because the Erie Canal furnishes the easiest, the safest, and in all respects, the best route to market?

The natural formation of the route occupied by the Erie Canal, gives it a controlling advantage over all the projects for connecting the Atlantic ports east of the Alleghany Mountains, with the waters west of them. In estimating the advantages and disadvantages of the several routes, more prominence has usually been given to the length of the route, than to the elevations to be overcome.—Sufficient weight has not been given to the facts, that while the routes of Pennsylvania, Maryland, and Virginia, cross the Alleghany Mountains at an average rise and fall of more than 2,500 feet; on the route of the Hudson river, nature has broken through this formidable barrier, and brought it down to the level of the tides of the Atlantic. And the residue of the New York route, from the head of tide at Troy to Buffalo, is more favorable by 1,500 feet rise and fall, than the Pennsylvania route, excluding the portage over the mountains.

This peculiar formation was noticed by Mr. Colles, in his publication in 1785. He says:—"The Alleghany Mountains, which pass through all the states, seem to die away as they approach the Mohawk."

The Edinburgh Encyclopedia, vol. xviii., p. 261, in alluding to the valley of the Mohawk, says:—"The Mohawk carries a chasm in the continent, rising in no place to 426 feet above mid tide level in the Hudson. The table land between the Mohawk and the Oneida Lake is the lowest depression in the Appalachian system, and at right angles to its chains, from the southwestern termination of the system to the St. Lawrence, near the confluence of that great stream and the Ottawas. To this, the still deeper depression of the Hudson and Lake Champlain route is no exception, as the latter extends evidently along, and not at right angles to the mountain valleys."

Gen. Peter B. Porter, in a very elaborate and able speech in Congress in 1810, on the subject of an appropriation of lands for internal improvements, thus alludes to the advantages of the New York route:—"The Alleghany Mountains have a uniform elevation of about 3,000 feet above the level of the tide. Their bases, together with those of their parallel ridges, occupy a distance, transversely, of about 100 miles. The only practicable route for an ascending navigation to the lakes, is by the way of the Hudson and the Mohawk, in the State of New York; the Hudson being the only river whose tide waters flow above the Blue Ridge or eastern chain of mountains. The Mohawk rises in the level lands of the western country, takes an

easterly direction for about 140 miles, where it passes around the northern extremity of the western chain of the Alleghany Mountains, and falls into the Hudson. From thence, the two rivers united, take a southerly course, and breaking through the eastern chain of mountains, commonly called the Blue Ridge, at West Point, fall into the Atlantic at New York."—*Merchants' Mag.*

To be continued.

THE LOCOMOTIVE STEAM ENGINE.

"I love," says Elihu Burritt, "to see one of those huge creatures, with sinews of brass, and muscles iron, strut forth from his smoky stable, and saluting the long train of cars with a dozen sonorous puffs from his iron nostrils, fall back gently into his harness. There he stands, champing and foaming upon the iron track, his great heart a furnace of glowing coals; his lymphatic blood is boiling in his veins; the strength of a thousand horses is nerving his sinews; he pants to be gone. He would drag St. Peters across the desert of Sahara, if he could be carefully hitched to it; but there is a little sober-eyed, tobacco-chewing man in the saddle, who holds him in with one finger, and can take away his breath in a moment, should he grow restive and vicious. I am always deeply interested in this man, for, begrimed as he may be with machinery, he is the physical mind of that huge steam horse."

ON THE CLEANSING OF METAL CASTINGS.

In the old process of cleansing metal castings from the coating of oxide and sand with which they are covered when taken from the mould, the work is thrown into water acidulated with sulphuric or hydrochloric acid, which acts upon the surface of the metal, and more or less completely removes the covering of foreign matter. The acid, however, leaves the surface rough and unequal, and it is generally necessary, after its action, to have recourse to mechanical means to effectually take away the oxide. Some time since, M. Sorel had remarked, that the cleansing of castings was more completely effected by the acidulated water produced in certain processes employed in the depuration of oils, and left as refuse, than by a mere mixture of acid and water; and, according to the experiments of M. M. Thomas and Delisse, the oxide and sand are removed from cast surfaces with great certainty and facility, if, to the water acidulated with sulphuric acid, organic matter such as glycerine, artificial tannin, naphthaline, creosote or stearine be added. The acid liquor, thus prepared, does not dissolve the coating of oxide, but causes it to become detached and scale off without sensibly attacking the surface of the metal beneath; there is no disengagement of hydrogen gas, as when common dilute acid is employed, even when the immersion of the metal in the bath is continued for a very considerable time; and the surface, after the operation, is uniform, quite clean and smooth.

In practice, it is found that, by the employment of the mixture described, 60 per cent. of acid is saved, and not one half as much metal lost as in the old process. The new method is also peculiarly applicable to the cleansing of works in zinc and brass. It may be remarked, in passing, that if the mixture of water, acid, and organic matter be employed as the exciting fluid in a cell of Bunsen's galvanic battery, the consumption of the zinc will be diminished to one eighth the ordinary quantity, without in anywise enfeebling the energy of the electric current.

The substances mentioned above as being employed, in addition to the acid liquor, in the experiments of M. M. Thomas and Delisse, being somewhat difficult to procure under some circumstances, particularly by persons engaged in ordinary industrial occupations, M. Elsner entered upon a series of trials, in order to ascertain whether or not organic matters of a cheaper class, and more easily procurable, could not be substituted for those already tried with so much success. With this object, both wood and coal tar were mixed with the dilute acid. As these substances contain creosote and other products of the destructive distillation of organic bodies, the useful effect of which had been proved by the previous experimenters, it was believed that they would advantageously replace the rarer and more expensive materials first tried.—

The mixture of tar and dilute acid was, in fact, found to answer perfectly well the objects of the experiment; a piece of casting, in iron, was immersed in the mixture—the metal was completely cleansed of the coating of oxide without any disengagement of hydrogen gas; and the surface was of a clear greyish black color, quite clean and smooth, and totally unattacked by the acid. A similar piece of casting, immersed in the kind of acid solution ordinarily used in this process, was almost wholly dissolved in an equal time. The practical value of this process seems to be so considerable as to render it worthy of being generally known and tested by more extended trials.—*Mining Journal*.

Illinois.

Galena and Chicago Union Railroad.—As will be seen by an advertisement in another column, the Galena and Chicago Union railroad has declared a dividend of eight per cent on the stock for the six months ending the 31st day of October. The dividends are to be paid on the 10th day of December next, one half in stock dividend certificates and one half in cash. The certificates are redeemable in full paid shares of stock in the first division of the road when presented at the railroad office, in sums of one hundred dollars. Those stockholders who have paid but 75 cents on the dollar, will have the demand on them met by the dividend of \$3 each on each share, while those who have paid 78 cents or over, will get their dividends in cash.

This dividend of 8 per cent speaks well for the prosperity of the road, and establishes beyond doubt the fact that as a permanent investment for capitalists the road cannot be excelled.—*Chicago Democrat*.

Missouri.

Railroad Iron.—The steamer Grand Turk landed at our wharf on Friday last, with a large quantity of rails and other iron intended for the St. Clair railroad. This, we believe, is the first arrival for that work, and we learn that a very large amount of iron, machinery, etc., is expected at New Orleans for the same enterprise in a few days.—*St. Louis Intel.*

Virginia.

Seaboard and Roanoke Railroad.—Two new advertisements will be found in this number of our paper over the signature of the Engineer of the Seaboard and Roanoke railroad. One of these is for sills and the other for bridge timber. We learn that about 15 miles of the road are laid with T iron and that Capt. Barnes and Mr. Pratt have put a number of hands at work on this end of the road about Boykins or Margarettsville. One gentleman from this place has been employed, and left here on Monday morning last to commence operations below Margarettsville. Goods are already leaving Portsmouth on the cars for merchants at and beyond Suffolk, and things do really look like the road is coming on rapidly. Captain Barnes, who is very much of a gentleman and an accomplished engineer, thinks the road will be completed to this place by the 1st of April or May.—*Weldon Herald*.

Lake Superior Items.

We gather from the Journal the following items:

On the 19th ult. the schooner Ocean, of Detroit, that has been several years running on Lake Superior, run over the Ste. Maria Falls. It was a grand spectacle. The whole length of the rapids was run in four minutes. This is the second vessel that has gone over this season.

A correspondent writing from Ontonagon, says of the companies there at work: "The Minnesota is the pioneer of successful mining in the Ontonagon district; for the extent of ground opened, it has been extraordinarily productive. Had their stamp works been in operation in the early part of the summer, their shipments would have reached about 40 tons this season. This mine was first opened in the fall of 1848, and commenced with

about twenty people, who were accommodated with one log cabin; now they have a population of 170 people, and with the buildings for mining accommodation, which, together with stamp and saw mill, give the appearance of a respectable village. Their mining work is progressing rapidly. Four shafts are being sunk; one is now at the depth of 140 feet. The first level is being extended so that by spring it will be opened 900 feet long. The second level is now about 500 feet. The produce of the mines, and the stamp work on hand, must pay a handsome dividend to the company next season."

Wisconsin.

Fon Du Lac Railroad.—Mr. E. F. Johnson, a distinguished engineer, who has been extensively employed in this State in making surveys, etc., passed through this city a few days ago, on his way to Wisconsin, to take charge of the Fon du Lac railroad, just about to be commenced. It is to run to Fon du Lac, on Lake Winnebago, to some point on the Chicago and Galena railroad, not yet determined upon. There is no doubt that the road will be built at an early day, a company of eastern capitalists having furnished the necessary funds. The Chicago Democrat says it is evident that the line will be a profitable one, from the nature of the country through which it passes, comprising the richest portion of the State of Wisconsin. The railroad will unite the lumber regions of northern Wisconsin with the State of Illinois, at the same time that it passes through the finest manufacturing region in the west. It will pour into the Galena and Chicago railroad line an immense amount of traffic, and will furnish the entire State of Wisconsin with a market for its produce, and a means of obtaining in return the products of other regions and the manufactures of the east.—*Buffalo Express*.

Ohio.

Central Railroad.—That portion of the Central railroad from two miles east of Newark to the city of Columbus has just been put under contract.

The foregoing, in connection with the work already in progress, comprises the entire line from Zanesville to Columbus. It is intended to push the work with energy till completed.

Connecticut.

The New Haven Journal of Tuesday says, in regard to the New London railroad: We are pleased to learn that the subscription to the work of this important enterprise is such as to insure confidence that it will soon be put under contract.

SUBMARINE TELEGRAPH FROM DOVER TO CALAIS.

The very general interest which has attached to the successful results of the experiments here, during the last week, induces us to give to the public, through your columns, the earliest intimation that the telegraph communication between the two countries is temporarily suspended, in consequence, upon examination, of an injury sustained by the wire on some sunken rocks off Cape Grinez. This circumstance, however, is of the less importance, inasmuch as some weeks must otherwise have necessarily elapsed before the communication between London and Paris would have been rendered complete, without which the line would be practically of little use, whilst the experience which has been gained of the nature of the coasts, and the obstacles to be contended with will conduce, in repairing the present injury, to the avoidance of a similar catastrophe, and the selection of a safe route for the six permanent wires. The practicability of printing communication from coast to coast in a moment of time, having been established beyond a possibility of a doubt, there is no ground for discouragement, and the difficulty now met with (by no means unexpected) will only stimulate to additional exertions, and secure the full completion of an enterprise—the first effect of which must be to

unite in bonds of common interest the two most powerful nations of the world.—*Min. Jour.*

Louisiana.

New Railroad Project.

TO THE EDITOR OF THE R. R. JOURNAL:

Sir—Under the provisions of an act of the Legislature of this State, approved March 15th, 1850, authorising the formation of a company to construct a railroad from the Mississippi river to some convenient terminus on Grand river, an act of incorporation has just been completed for that purpose. The proposed termini of this road are a point on the Mississippi just above the town of Donaldsonville, where an excellent landing for all class steamers can be had at all stages of the river, and the other on Grand river about 13 miles below Lake Natchez. The length of the road will be about 204 miles, passing through a thickly settled portion of the State, and certainly one of the richest, in point of agricultural resources, in the south. But the great object for the construction of this road is to afford the citizens of the Attakapas parish, and the parishes of Opelousa, which embrace the largest portion of our sugar district, an easy, safe and cheap communication at all seasons. They are now, and have at the periods of the year which they require communication to New Orleans, been in a measure pent up, without, I may say, any outlet—the navigation being in low stages long, tedious and expensive; besides being attended with considerable danger. This road will remove all these objections, as it will shorten the distance to the city 80 or 100 miles in high water, and nearly 300 in low water. The enterprise presents so many advantages, in point of location, being through its whole length one level track. No excavations required, and the only embankments being for a short distance, only 2 to 3 feet, two or three small bridges required on the route. The freights over the road will consist of sugar and molasses, [of which 42,000 hhd's of the former and 55,000 bbls. of the latter were manufactured last year in the Attakapas parishes alone,] cotton, moss, lumber, pickets, staves for barrels and hogsheads, of which immense quantities are sold on the river, shingles, boards, fruits, game, fish, machinery for sugar houses, merchandise, hay, corn, wool, cattle, of which large quantities are brought to the New Orleans market from this section of the country. This road cannot fail to be one of the most productive in the whole country. When you compare the cheapness of building the road, and the vast amount of business that will be done on the route, you cannot doubt the astonishing results in favor of the project. Subscription books will be opened on the first of November in New Orleans, by George C. Lawrason, Jas. Benner and Geo. Hall; in Donaldsonville by A. J. Powell and Andy Gurgry; in Attakapas, by Judge Moore and F. D. Richardson. The capital stock is fixed at \$200,000, which sum I feel confident will construct the road, including switches, turn outs, depots, etc.

Donaldsonville, La., Oct. 29, 1850.

Indiana.

From the Newcastle, Ind., Courier we learn that the amount necessary to organize the Richmond and Newcastle railroad, \$100,000, has been subscribed, and that an election for directors was held on the 2d November.

Evansville Railroad.—We are gratified to learn that the subscription to this road is already swelled to an amount sufficient to warrant the completion of the work to Vincennes.

Banks in Maine.

Abstract of the situation of the banks in Maine, on the first of October last:

Capital stock paid in.....	\$3,248,000 00
Bills in circulation.....	2,654,208 00
Net profits on hand.....	171,944 64
Balances due other banks.....	48,006 91
Cash deposited, &c., not bearing interest.....	\$1,223,671 77
Cash deposited bearing interest.....	38,285 57

Total amount due from the banks....	\$7,383,116 84
Gold, Silver, &c., in banks.....	475,589 24
Real estate.....	111,905 20
Bills of banks in this state.....	92,298 15
Bills of banks elsewhere.....	95,137 77
Balances due from other banks.....	778,955 81
Due to the banks, excepting balances.....	5,830,230 72

Total amount of resources of the bks. \$7,384,116 89

Georgia.

Comparative statement of the earnings of the Georgia railroad in the month of October, 1849 and 1850; also, during the seven months ending 31st Oct. 1849 and 1850:

	Passengers.	Freight, mail &c.
1850.....	\$21,327 40	\$55,359 45
1849.....	16,998 74	55,472 84

Increase..... \$4,328 66 Dec. \$113 39

April 1st to Nov. 1st.

	Passengers.	Freight, mail &c.
1850.....	\$136,617 94	\$216,252 73
1849.....	99,832 89	187,795 67

Increase..... \$36,735 05 \$28,457 06

The Philadelphia Coal Trade.

The Philadelphia Ledger of the 19th says:

The anthracite coal trade was never, probably, more prosperous than now. Prices are weekly rising, and but for the increased activity of trade on the Reading railroad, the public interest in the coal trade would be heightened by the prospect of having to pay ten dollars per ton before the close of the coming winter. As it is, from six to seven dollars per ton is not improbable. The Lehigh Navigation company has given notice that it has already taken as many orders as it will probably be able to fill before the close of navigation, and though the Reading railroad is bringing down weekly 50,000 tons, the demand prevents any surplus stock at Port Richmond. The colliers have, we understand, put up the price at the mines; and, in consequence, the coal dealers of this city held a meeting on Monday evening, and put up the price to \$5 25 per ton for all sizes of Schuylkill coal, except nut coal, which is fixed at \$5. Lehigh coal is retailing here at \$5 15 1/2 per ton, it being preferred by most persons at the advance over the Schuylkill coal. The advance of price is caused by the serious damage by freshet to the Schuylkill and Lehigh Navigation companies, interrupting navigation on the Lehigh for more than a month, and on the Schuylkill for nearly half the season. How high a price the New York and more eastern consumers of coal will have to pay before the winter is over, is not now easy to limit.

Kentucky.

Lexington and Frankfort Railroad.—The receipts of this road for the six months ending Nov. 1 were \$29,720 38; expenses during the same period, \$14,551 30; total number of miles run, 25,620; gross receipts per mile run, \$1 16; expenses per mile run, 59 cents; net receipts per mile run, 59 cents.

We copy the following from the communication of the President of the company, W. A. Dudley, Esq., to the directors in relation to the earnings and operations of the road:

With a view to a correct appreciation of the result, it should be observed that during the last seven weeks included in the statement the navigation of the Kentucky river has been suspended on ac-

count of low water. The regular communication between Lexington and the Ohio river being thus cut off, the freights over the road during the months of September and October, [in ordinary seasons two of our busiest months] were exceedingly light, and the receipts of the company were thereby diminished several thousand dollars, without any corresponding diminution of our expenses. The completion of the Louisville and Frankfort railroad during the next summer will effectually guard us against the like interruptions in future. The prevalence of the cholera in different sections of the state during the months of July and August also exerted a most depressing influence on our business.

The City Council of Louisville has authorized the vote of the people on the question of subscribing \$500,000 on the railroad to Nashville, \$300,000 to Jeffersonville and Columbia railroad, \$100,000 to the Lexington and Maysville railroad. It has also appropriated \$100,000 for the completion of the Frankfort railroad.

Maryland.

Baltimore and Ohio Railroad.—At the regularly monthly meeting of the directors of the Baltimore and Ohio railroad, held this morning, Thomas Swann, Esq., was unanimously re-elected President of the company. This unanimous vote of the directors, in which Mr. Swann's administration of the affairs of the company is formally approved, is a compliment which has been well earned, and which the public sentiment, by an equally unanimous vote endorses.

The present prosperous condition of the affairs of the road, as far as it is completed, and the gratifying prospects which are before us, for its early extension to the Ohio river, are conclusive evidence of the wisdom of his administration, and the zeal and ability with which it was carried out by the officers of the company.

We publish below the monthly return of the business done on the road in the last month. It is another gratifying evidence of continued prosperity.

A large portion of the bonds of \$500,000, which were recently offered by the company, have been taken at from 95 per cent to par; and it will be seen by the advertisement of the secretary, that those remaining on hand will be disposed of at 95 per cent. No safer and no more profitable investment than these bonds can be found any where.

Business of the Road.—The following are memoranda of the business upon the Baltimore and Ohio railroad, for the month of October, 1850:

	For passengers.	For freight.
Main stem.....	\$37,542 10	\$97,325 03
Washington branch....	23,734 77	4,692 33

\$61,276 87 \$101,987 36

Making an aggregate of \$134,867 13 on the main stem, and \$28,397 10 on the Washington branch—the total being \$163,264 23.

The above shows an increase over the corresponding month of last year of \$12,693 11, being \$8,905 92 on the main stem, and \$3,787 19 on the Washington branch.—*Patriot.*

Massachusetts.

A meeting was recently held at New London, for the purpose of ascertaining the feasibility of a railroad from Palmer, along the valley of the Ware river, to South Gardner or to Winchendon. A road has been completed from New London to Palmer, 66 miles; and it was suggested, at the meeting, that if continued it would form a direct route from the north, even from Concord, N. H. to New York by the way of Palmer and New London. Such a road would undoubtedly be of great service to the

towns through which it would pass, and form an important through route.

Worcester and Nashua Railroad.—The net profits of the Worcester and Nashua railroad for the year 1849 were \$42,119 19, which the directors applied to the payment of debts. The total income of the road for 1849 was \$108,125 64. Their business this year shows an increase to October 1st of \$23,491 27 over the corresponding period of last year. The total income of the year to December 1st can fall little, if any, short of \$150,000. A dividend of 24 per cent will be made for the six months ending on 1st December next.

Bank Capital in Massachusetts.

The Bankers' Magazine for the present month, just published, gives a statement of the increase of bank capital in this state since Feb., 1849. This increase consists in part of enlarged capital of 16 banks previously existing, of which five are in this city, and eleven in the country, to the amount in all of \$1,434,989, and the establishment of ten new banks, of which three are in Boston and seven in the country, with an aggregate capital of \$2,100,000. The whole increase of capital amounts to \$3,534,989; and the present aggregate capital is \$38,165,000. The capital of the new banks in Boston is \$1,400,006, making a total in the new and old banks of \$21,760,000. In the new country banks \$700,000, total capital of country banks \$16,405,000. The Magazine gives in detail the names and increased capital of each of the banks. The amount of bank tax for the last six months is \$179,600, and for the year the amount will be \$359,200.—*Boston Adv.*

Michigan Southern Railroad.

The South Bend Register communicates the following interesting intelligence as to the progress of this road:

A general meeting of the board of directors of the Southern Michigan and Northern Indiana railroad companies, assembled at the town of Elkhart on the 22d ult. There were present George Bliss, Esq., (president of both companies,) Eliisha C. Litchfield and Charles Noble, of the Southern Michigan; Dr. H. Beardsley, Wm. C. Hanna, Jas. Bradley, Thos. S. Stanfield and Ezekiel Morrison, Esqrs., of the Northern Indiana. Much business of importance, we learn, was transacted at this meeting. The board having settled the question that Bristol, Elkhart, Mishawaka, South Bend and Laporte, should be points on the main line of the road, a resolution was adopted "that the road from Toledo to Laporte should be completed, and the cars running on the whole line by the first day of January, 1852." We also learn that arrangements are being made to complete the road through to Chicago in the same time.

Proposals are advertised for ties for the road from the Michigan State line to Laporte, the grading and bridging to be let as soon as the next first of February, and a portion probably sooner.

Ohio and Pennsylvania Railroad.

The Pittsburgh Gazette, speaking of the Ohio and Pennsylvania railroad, says—

It gives us pleasure to state, that the condition of this great Pittsburgh work is of the most satisfactory character. All along the line the work is progressing as fast as was anticipated, and gives assurances that the road will be ready for the cars as soon as was contemplated. Three ships have been chartered to deliver the iron in New Orleans, and the manufacturer of the American contract promises to be up to time. The president of the company, Gen. Wm. Robinson, Jr., has contracted for seven express locomotives. Three are to be built in Boston, and four in Philadelphia. Arrangements are also making for the construction of a sufficient number of very superior first class passenger cars. These locomotives and cars are to be paid for in the bonds of the company, at a very fair price; and bonds have also been negotiated for the supply of all the additional funds needed to finish and stock the road. All the chairs and spikes for laying down the rails have also been contracted for; the

chairs to be of wrought iron. In fact, all the necessary arrangements have been made to finish and stock the road from this city to Wooster, and to make it in every respect equal to any railroad in the country. The line beyond Wooster to the western terminus will be put under contract as soon as the citizens of Ashland and Richland counties take a sufficient amount of stock to justify the directors in taking such action.

AMERICAN RAILROAD JOURNAL.

Saturday, November 16, 1850.

Notice to Contractors.

ATLANTIC & ST. LAWRENCE RAILROAD.
PROPOSALS will be received by the subscribers, at Leary Tavern, in the town of Gorham, New Hampshire, until the 30th of November, for the Grading and Masonry of that portion of the Atlantic and St. Lawrence Railroad extending from Peabody's River in said Gorham, to the Connecticut River, a distance of about 30 miles.

Plans and profiles will be in readiness for examination after the 20th inst., at the Engineer's office at Gorham, N. H.

This line embraces some heavy work, and Contractors of means and experience will find this notice worthy of their attention.

Spirituous liquors will not be allowed on or about the work; nor will the propositions of Contractors be considered, who have heretofore failed to pay the laborers employed, on this, or any other public work.

Cash payments will be made monthly, reserving ten per cent. until the final completion of the contract.

WOOD, BLACK & CO.
Portland, Nov. 5, 1850.

General Railroad Laws.

The people of every State in the Union would think it a very absurd thing, if they were compelled in all cases to apply to their Legislatures for the privilege of constructing a road for ordinary travel; both from the inconvenience of the thing, and for the still stronger reason that they themselves are much more competent to decide upon their wants, than those who know nothing about them. But as roads must be made, and as the making of them involves the necessity of taking land against the wish perhaps of the party from whom it is taken, Legislative authority is necessary for this; and this authority is given in a general law, applicable to all cases; those seeking the construction of a road being deemed the best judges of their own interests, and are consequently allowed to decide upon the direction, cost, mode of construction, etc., etc. Such is the course of policy which long experience has shown as best calculated to promote the interest of the community in reference to common roads. If it is applicable to these, it is to railroads in as much greater degree as the latter are superior to the former in cost, in usefulness and in results, and require for their successful management the more free and untrammelled exercise of private judgment.

These are common sense rules as far as construction is concerned. They become the more important from the fact, that so long as distinct charters are granted for each particular case, those who obtain the first, regard themselves as possessing certain vested rights, which will be infringed by a second charter; or that their interests will be prejudiced by it. The first grantee, therefore, always arrays himself against the second claimant, and when a large number of charters are granted, and large interests are at stake, it often happens that those possessing them can by concert control the Legislature of a State, and refuse altogether to others the privileges they enjoy. The rights of a majority may thus be defeated by the wealth and

concert of a minority, and monopolies may be perpetuated by the influence which the very monopoly may be able to exert.

Another very important reason for general railroad laws, is the refusal of some States to grant the right of way to certain lines, for fear that they will divert trade and travel for the benefit of others.—Now the greatest good of the greatest number in every State, is promoted by the most perfect freedom in the transit both of travellers and merchandise. If the navigation of the Mississippi should be broken by a rapid, the great mass would suffer, though it might essentially benefit those who enjoyed the privilege of carrying by such rapid.—What they received would be just so much of a tax upon the whole community. So with every interruption to a line of railroad. The inconvenience which the public might suffer, might to a certain extent benefit a few; but where an advantage is based upon injury to others, this advantage is the exact measure of the absolute loss to the whole. Restriction therefore is positive evil. In addition to this reason, no State has a right to impose burdens upon the citizens of other States passing through it. It is equally against good faith, as well as positive law. The wants of our people, as a whole, should, if we may use the term, project themselves in lines of railroads, following the natural direction of trade and travel. The right to construct should be as free as the ability to conceive them.

Another argument in favor of free railroading is the healthy influence it is sure to exert upon the progress of these works. When men are left entirely free to act, they will not generally act without reason. They will not inconsiderately be forced into the commencement of works, for the purpose of saving a charter, nor from the influence of passion, or an excitement into which they may have been wrought in the contests for a charter.—Many lines in this country have been unwisely commenced from these causes, which would never have been touched if men had been left free to act.

Another very important reason in favor of general laws upon this subject, is the expenses of obtaining a special act, and this expense increases just in proportion to the number granted. It encounters the opposition of all before it; and can only combat this opposition by the use of similar means—money; thus of necessity involving more or less corruption in almost every case. In England \$10,000 a mile is considered in no way extravagant for Parliamentary expenses of a line—a sum sufficient to build a road with us. It is the enormous expenses like the above, to which English railroads have been subject, that such vast losses have been experienced there; an example which we may and should avoid.

Such are some of the reasons in favor of general railroad laws by every State. We have in practice a good many illustrations of their necessity.—Look at the Baltimore and Ohio railroad, and see how much the symmetry of that line is impaired, and its value diminished, by being compelled to go through Wheeling. Here is a heavy tax imposed upon every passenger and every pound of merchandise transported over the road for the benefit of that city alone. The people of Erie, in Pennsylvania, if they had the power, would prevent the extension of the New York and Erie through that State, and thus completely sever the magnificent line of railroad of which that road is to constitute a part. So long as the right to build railroads depends upon the special legislation of each State, it will often happen that the caprice or selfishness of a few men

will control and defeat popular rights. The best way to remedy this evil, is to concede to the people the right to construct works of internal improvement whenever and wherever they wish to build them.

Maine.

The Kennebec and Penobscot railroad company is to be organized at Bangor on the 27th inst. The distance from the two rivers by line of the road will be about 50 miles.

By reference to an Advertisement in our paper of to-day, it will be seen that the Atlantic and St. Lawrence railroad is to be put under contract to the Connecticut river immediately.

Vermont.

The Vermont and Canada railroad is running as far as St. Albans, and will be in operation soon for its whole length. The completion of this link, it is expected, will add largely to the business of the Vermont roads and the Ogdensburg.

The Vermont Legislature will undoubtedly authorize the bridging of the lake at Rouse's Point. Should the Legislature of this State grant the same privilege to the Northern railroad company, of which we should hope there is no doubt, both New York and Boston will enjoy uninterrupted railroad communication with Ogdensburg; a matter of as much importance to this city as to Boston.

There is no State in the Union, in which, in proportion to its territory and population, so many miles of railroad have been built in the same space of time, as in Vermont; and none, whose people, like hers, are devoted almost exclusively to agricultural pursuits, enjoy such facilities of railroad communication. She has two lines of railroads running nearly parallel north and south through the State, two running diagonally through it east and west. In addition to these, the Atlantic and St. Lawrence will for some distance skirt her eastern border, and the Troy and Whitehall, and Troy and Rutland, her western. Other roads are projected, but without such, her people have no reason to complain of the want of suitable means to get to a market.

Continuous Railroad Iron.

Messrs. E. Pratt & Brothers have exhibited in the lower room of the fair at Washington Hall, a specimen of the continuous railroad iron manufactured at the Mount Savage Iron Company's Works, near Cumberland, Md. The rail does not differ in form essentially from the usual T rail, but it is divided into two sections longitudinally, and a continuous rail is thus obtained by breaking the joints. This, it will be readily perceived, is an important improvement, entirely obviating the liability to give way at the joints, which is experienced in the use of other patterns of rail. The Utica and Schenectady railroad company, in New York, after thoroughly testing the rail by twelve months' trial, have contracted for the supply of 1000 tons of it, the larger portion of which has already been sent forward. With this rail a greater speed may be obtained over the road, with equal safety and less wear and tear to the road and cars, and it will no doubt soon recommend itself to general use.—*Baltimore American.*

Portland and Halifax Railroad.

The Hon. Joseph Howe, Provincial Secretary of Nova Scotia, has been appointed by the N. S. government to proceed to England, to endeavor to prevail upon the English government to extend to the province the aid required for the construction of

Curious Substitute for Coal Cars.

The Pottsville Mining Register states that Mr. Lawrence Myers has taken out a patent for a substitute for coal cars, the practicability of which will be shortly tested on the Reading railroad. "It consists," says that paper, "simply of a cylinder somewhat smaller than the wheel, of which it will form the axle. The wheels it is proposed to make 54 inches in diameter, while the cylinder will be 42 inches, so as to elevate it sufficiently above the grade of the road to avoid its coming in contact with stones or other obstructions. Each cylinder of this size will contain two tons of coal, so that two cylinders requiring four wheels will hold just the same as the cars now used. The cylinder and wheel are, of course, permanently attached together, and its contents will revolve with it, the rapid motion preventing any friction of the coal. The new form possesses many supposed advantages, not the least of which is, that each locomotive will be able to carry at least double the quantity of coal than by the present method. Two or more cylinders can be attached together by a wooden framework outside of the wheels, which will be necessary to couple these 'Revolvers' into a train."

New York.

The Wayne Sentinel states that the line of the direct railroad through Palmyra village, as originally surveyed by Mr. Childs, has been substantially adopted by Mr. Taylor, the engineer having charge of that division of the road. The entire line is now nearly located and established through Syracuse to Rochester, and it is expected that the same will shortly be in readiness for grading.

Ohio.

Cincinnati and Belpre Railroad.—Mr. Kennedy, the Engineer, employed by the Belpre company, has proceeded to Hillsborough, to commence preparing the line from Hillsborough to Chillicothe, for immediate letting to contractors. If energetic measures are taken, the cars will run through from Cincinnati to Chillicothe in less than a year. We have no doubt such will be the fact.—*Cin. Atlas.*

SLAVE LABOR IN COTTON FACTORIES.

We had the gratification recently of visiting a factory, situated on the Saluda river, near Columbia, S. C., and of inspecting its operations. It is on the slave labor, or anti-free soil system—no operators in the establishment but blacks. The superintendent and overseers are white, and of great experience in manufacturing. They are principally from the manufacturing districts of the north and though strongly prejudiced, on their first arrival at the establishment, against African labor, from observation and more experience, they all testify to their equal efficiency, and great superiority, in many respects. So as not act precipitately, the experiment of African labor was first tested in the spinning department. Since which, the older spinners have been transferred to the weaving room. They commenced in that department on the 1st of July, and are now turning out as many yards to the loom as was performed under the older system. A weaver from Lowell has charge of this department; and she reports that, while there is full as much work done by the blacks, they are much more attentive to the condition of their looms. They all appear pleased with the manipulations on which they are employed, and are thus affording to the south the best evidence, that when the channels of agriculture are choaked, the manufacturing of our own productions will open new channels of profitable employment for our slaves. The resources of the south are great; and it should be gratifying to all who view these facts with an eye of a statesman and philanthropist, that the sources of profitable employment and support to our rapidly increasing African labor, are illimitable, and must remove all motives for emigration to other countries. By an enlightened system of internal improvements, making all parts of the state accessible,

ble, and by a judicious distribution of our labor, South Carolina may more than double her productive slave labor, and not suffer from too dense a population.—*Charleston Mercury.*

Notice to Contractors.

PROPOSALS will be received at the offices of the Baltimore and Ohio Railroad Company, at Baltimore, Cumberland, Fairmount and Wheeling, until SATURDAY, the 24th of November next inclusive, for the Graduation and Masonry of about 33 sections or miles of the line, extending westwardly by the waters of Fish Creek and Grave Creek, and over the dividing ridges between them, from the 160th section of the part of the line already let, to the 204th section of the same line—being the only portion of the route remaining to be put under contract.

The work to be let will be generally heavy—including a tunnel of 2450, another of 1250, and a third of 400 feet in length, a number of deep cuttings and embankments, and a considerable quantity of Bridge Masonry. Specifications will be ready at the above offices, on or after the first day of November, and Engineers will be upon the line to give information.

No bid unsupported by good testimonials will be considered, and bidders are desired to state if they have other work on hand, and when it will be finished. The most energetic prosecution of the work will be expected.

By order of the Board of Directors.

BENJ. H. LATROBE,
Chief Engineer.

To Contractors.

ENGINEER'S OFFICE TROY & BOSTON R.R.,
Troy, November 5, 1850.

PROPOSALS will be received by the subscriber until November 20th, 1850, for the Grading, Masonry and Fencing of the unoccupied sections of the Troy and Boston Railroad—between Hoosick Falls and Troy—viz: sections 3, 4, 5, 6, 7, 8, 10, 14, 17, averaging one mile each.

Plans and specifications may be seen on application at this office. S. F. JOHNSON,
Chief Engineer.

Rochester Scale Works.

ESTABLISHED IN 1841.

THE Subscribers are manufacturing and prepared to furnish upon order all kinds of Scales, such as Canal Weigh Lock Scales, from 100 to 400 tons capacity, Railroad Track and Depot Scales, Cattle, Coal, and Hay Scales, Dormant and Wheat or Hopper Scales, Portable Platform, and Counter Scales, Sugar Crushers, Letter Presses, Warehouse Trucks, Wheat Cars, etc., etc.

Our long experience in the business, and the facilities we have for manufacturing, enables us to supply all orders promptly. Every article made of the best material and warranted.

REFERENCES:

J. W. Brooks, Supt. Michigan Central R.R., Mich.
Benj. Loder, Prest. N. Y. & Erie R.R., New York.
Charles Minot, Supt. do. do. do.
The Hon. Board of Canal Commissioners and Engineers of Erie Canal Enlargement.
E. F. Osborn, Supt. Mad River & Lake Erie R.R., O.
Sam'l Brown, Chief Clerk Freight Department New York & Erie R.R., New York.
John Wilkin-on, Prest. Utica & Syracuse R.R., N.Y.
John B. Turner, Supt. Galena & Chicago R.R., Ill.
M. Sloat, Supt. N. Y. & Harlem R.R., N.Y.
Carlos Dutton, Supt. Roch. & Syracuse R.R., N.Y.
Henry Martin, Prest. Buffalo & Attica R.R., N.Y.
John Crookford, Agent Patterson & Hudson River R.R., New Jersey.
D. C. McCallum, Supt. Bridges & Buildings N. Y. & Erie R.R., N.Y.
B. Higgins, formerly Supt. Mansfield & Sandusky City R.R., Ohio.
A. H. Barber, Agent Mansfield and Sandusky City R.R., Ohio.
Charles Butler, Prest. Board of Trustees Wabash & Erie Canal, Indiana.
Jesse L. Williams, Chief Engineer Wabash & Erie Canal, Indiana.

DURYEE, FORSYTH & CO.

No. 15 Water St., Rochester, N.Y.
General Depot and Scale Warehouse,
No. 208 Pearl St., New York.

Great Work on Bridge Building, etc., etc.

JUST published in medium folio, One Dollar, 75 cts. to subscribers.

Part II of a "THEORETICAL AND PRACTICAL TREATISE ON THE CONSTRUCTION OF BRIDGES IN STONE, IRON AND WOOD," including the Equilibrium of Arches, the mathematical principles of the Oblique Arch, Suspension Arch, etc., Construction of Foundations in Water, Centering, Oblique Arches, etc., the application of Iron to Railroad Structures, Practical Tunnelling, Suspension Bridges, etc.; illustrated by numerous accurately executed Plans, Elevations, Sections and Details of Stone, Iron and Wood Bridges, Viaducts, Tunnels, Culverts, Machines, etc., constructed by the most eminent Architects and Engineers in Europe and the United States, and numerous Original Designs for Bridges, Viaducts, Culverts, etc. The whole calculated to meet the exigencies of Engineers, and assist Draughtsmen, Bridge Builders, Mechanics and Students. By George Duggan, Architect and Civil Engineer.

The present part contains beautifully executed plans, elevations, sections, and details of the Cast Iron Oblique Arch, 100 feet span, constructed on the system of M. Polonceau, over the Canal St. Denis, Gt. Northern R.R. of France, also plans, elevations, sections and details of a Timber and Iron Truss, 74 feet span, from St. Mary's Viaduct, Cheltenham and Great Western R.R., England, and a Wrought Iron Girder Bridge, 120 feet span, constructed for the London and Blackwall R.R., with the conclusion of the introductory article on the relative merits of the various forms of construction adopted, and materials employed, as regards economy, strength and durability.

Published by George Duggan, 300 Broadway, New York, to whom all communications should be addressed and subscriptions forwarded.

Parties remitting Mr. Duggan \$5. and the remainder \$4 when they have been supplied with the first six parts of the "Theoretical and Practical Treatise on Bridge Building, etc.," shall receive it monthly as published. To those making Mr. Duggan a present remittance of \$9, the work will be forwarded post free to any part of the United States.

NOTICE

For Proposals for Railroad Iron, for the Alabama and Tennessee River Railroad,

TO BE MANUFACTURED FROM ALABAMA ORE.

THE Alabama and Tennessee River Railroad Co. invite proposals, until the 1st of January, 1851, for Iron Rails, to be made of Alabama Iron, for the Northern Division and part of the Southern Division of their road, embracing a distance of about 105 miles. The rails are to be of the H pattern, in lengths of 18 feet, and weighing 63 lbs. per lineal yard. They are to be delivered on the Coosa river, at a landing to be hereafter designated, between Kimulgee ferry and Fort Williams, commencing their delivery on the 1st of November, 1851, and continuing it at the rate of from 80 to 100 tons per week, until the whole quantity required (10,500 tons) shall have been delivered. They are to be inspected by Lewis Troost, Chief Engineer.

It is proper to state to iron masters and capitalists at a distance, that the country traversed by the Northern and part of the Southern divisions of the road abounds in excellent iron ore and bituminous coal, and possesses every advantage for the successful manufacture of iron, health, cheap labor and provisions.

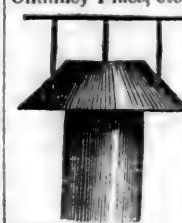
Further information may be obtained by addressing the President of the Company at Selma, Ala.

By order of the Board of Directors.

J. W. LAPSLEY, President.

Emerson's Patent Ventilator,

ADAPTED to Cars, Engine houses, Public Halls, Factories, Churches, School Houses, Dwellings, Chimney Flues, etc.



This Ventilator is stationary, and cannot get out of order. It is constructed in such conformity to cert in ascertained laws of pneumatics, as to insure a constant draft outward, whatever may be the changing direction of the wind. The Massachusetts Mechanic Association have awarded a gold medal to the inventor, and the Manufacturers have already disposed of over 3,000 of the article. Manufactured and sold by CHILSON, ALLEN, WALKER & Co., 351 Broadway, New York.

Great American Engineering

AND MECHANICAL WORK, just published in medium folio One Dollar, 75 cts. to Subscribers. Part VIII of "Specimens of the Stone, Iron & Wood Bridges, Viaducts, Tunnels, Culverts, &c., &c., of the United States Railroads." By George Duggan, Architect and Civil Engineer.

The present part contains beautifully executed plans, elevations, sections and isometrical views of the fine Timber Bridge, two arches, 150 feet span, across the Patuxent River, on the line of the Baltimore and Ohio R.R. Also Plans, Elevations and Sections of the Viaduct under the Erie Canal at Lodi, and Culverts of 4 feet chord on the line of the Utica and Syracuse R.R., with the Specifications, Estimates, form of Contract, etc., for the Hartford and N. Haven R.R. Extension.

Published by
GEORGE DUGGAN,
300 Broadway, New York.

To whom all communications should be addressed, and subscriptions forwarded.

Providence Tool Co.,

MANUFACTURERS OF

Plane Irons, Tooth Irons, Soft Moulding and Rabbit Irons, Cornice Irons, Plow Bits, and Planing Machine Knives:

NUTS, WASHERS AND BOLTS.

—ALSO—

PLATE HINGES AND PICK AXES.

They are prepared to execute orders for all descriptions of Cold Punching and Job Work.

WM. FIELD, Agent. **RUFUS WATERMAN, Treas.**
PROVIDENCE, R. I.

**Ibbotson, Brothers & Co's
CELEBRATED CAST STEEL**

AND

Best Cast Steel Royal Improved Files, well known as better adapted for Engineers' and Machinists' purposes than any now in use in the United States.

Every description of Square, Octagon, Flat and Round Cast Steel, Sheet, Shovel and Railway Spring Steel, etc., and Steel to order for any purposes—manufactured at their works in Sheffield—and universally known by the old stamp "Globe."

HENRY I. IBBOTSON, Agent,
218 Pearl st., New York.

**Faggotted Car and Engine
Axles**

FORGED by **RANSTEAD, DEARBORN & Co.,**
Boston, Mass.

These Axles enjoy the highest reputation for excellence, and are all warranted.

American Cast Steel.

THE ADIRONDAC STEEL MANUFACTURING CO. is now producing, from American iron, at their works at Jersey City, N.J., Cast Steel of extraordinary quality, and is prepared to supply orders for the same at prices below that of the imported article of like quality. Consumers will find it to their interest to give this a trial. Orders for all sizes of hammered cast steel, directed as above, will meet with prompt attention.
May 28, 1849.

**GRAHAM'S COMPOSITION,
to Remove and Prevent
Incrustation (or Scale) in
STEAM BOILERS.**

THIS valuable composition having been fully and extensively tested, is now offered to the public, as a sure remedy and preventive for incrustations in steam boilers of all descriptions. By its use, all scale is entirely removed from the boilers of Ocean and River Steamers, Locomotive and Stationary Engines, in from 3 to 20 running days, according to the size of the boiler and thickness of the scale. In New Boilers, all incrustation is prevented at a trifling expense.

The preservation of the boiler, great economy of fuel and labor, safety, and increased speed, are among the advantages to be derived from the use of this composition.

Orders should state the quality of water used, viz: "Salt," "Fresh," or "Brackish."

For sale, with directions for use, by

W. H. NEWMAN,
75 Pearl street,
New York.

TESTIMONIALS.

New York, August 17, 1850.

We have used Graham's Composition in the boilers of the Steamship Southerner, during several voyages between this place and Charleston. The boilers were old and very foul with scale, a very large quantity of which was removed by the use of the composition, and no new scale was formed.

From our own experience and observation in the use of the article, we are fully satisfied that it will effectually remove the incrustation made by sea water, and also that it will effectually prevent its formation.

We are also satisfied that the use of it will be attended with a great saving of fuel, and that it has no injurious effect upon iron.

DAVID N. MAXON, Engineer,
BERRY, Master,
Steamship Southerner.

Steamship Philadelphia, }

New York, August 27, 1850. }

I have used "Graham's Composition for Steam Boilers," in the boilers of Steamship Philadelphia, on the voyage to and from Chagres, and am entirely satisfied that it will remove, dissolve and prevent all scale or incrustation in salt water boilers.

For the preservation of the boiler and economy of fuel and labor, I hereby recommend the employment of this composition in the Boilers of Ocean Steamers

WM. BISBY,
Chief Engineer.

Novelty Iron Works, }

New York, July 5, 1850. }

We have examined the specimen of Graham's Composition for preventing incrustation of steam boilers, and we believe it may be used with perfect safety in reasonable quantities for the purpose intended, as there does not appear to be any agent in the composition calculated to injure the iron.

STILLMAN, ALLEN & CO.

Piermont, May 20, 1850.

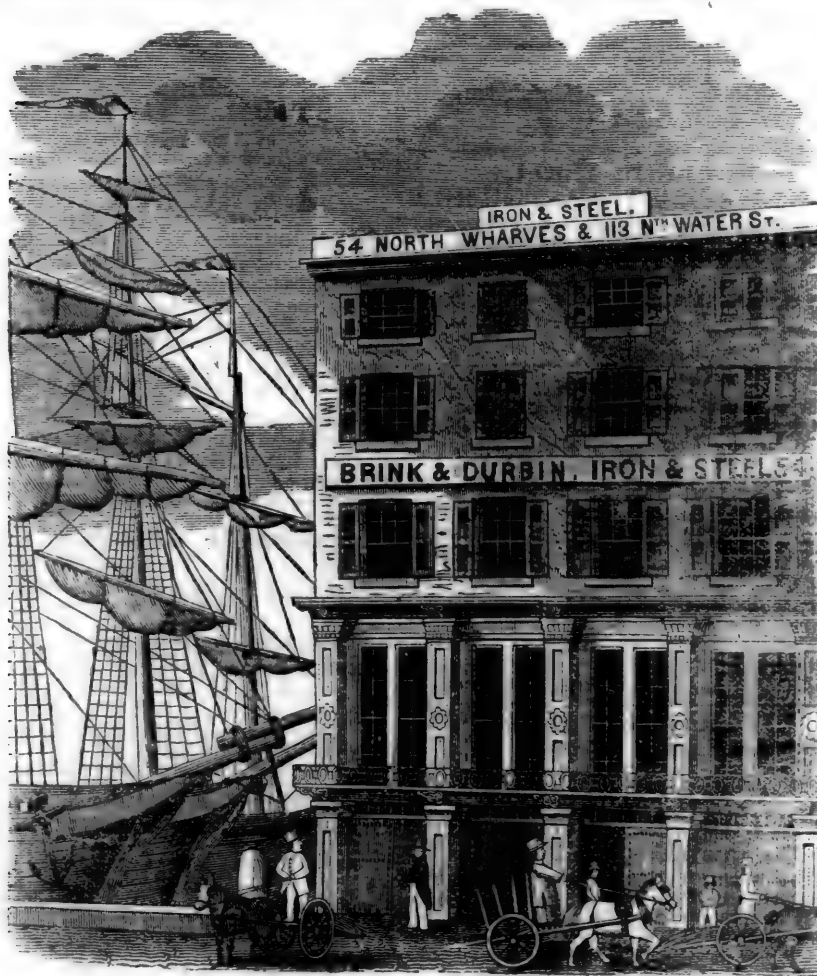
I have used "Graham's Composition," and find it to produce the intended effect; and I hereby, without hesitation, recommend it for Stationary, Marine and Locomotive Engine Boilers.

JOHN BRANDT,
Superintendent Motive Power
New York & Erie R.R.

New York, July 25, 1850.

In answer to many inquiries as to the practical effect of "Graham's Composition," I will state that I have used it in the boiler of the Steamboat Sunwick, which had become considerably incrustated with hard scale from both salt and fresh water. We used 10 lbs. per day, for three days, without blowing off the water, until the fifth day, when all was drawn off. To our astonishment, we found the whole interior of the boiler as clear of scale and smooth as when it came from the hands of the maker. The following week, we tried the same quantity in a small steam tow boat. The boiler had old scale of long accumulation and very thick. We ran the boat three days without blowing off, and on the fourth day washed out the boiler and found it, like the "Sunwick's," perfectly clean and smooth as when new. I am therefore enabled to state that the use of the composition in these two instances under my own immediate observation and direction, has been attended with complete success.

JAMES MORROW,
Engineer Astoria Ferry.

**To Merchants, Railroad Companies, Machinists and Boiler
Makers.**

THE subscribers beg leave to call attention to their very large stock of *Iron and Steel*—of American, English, Swede and Norway make—of all the different kinds in use. Also, Railroad Iron, Ship, Boat and Railroad Spikes. They are also Agents for the *Best Pennsylvania Locomotive Boiler and Tank Iron*, each sheet of which will be stamped and warranted, at lowest mill prices. Our prices for all kinds of iron will be found very low, either for cash or approved credit.

BRINK & DUBBIN, Philadelphia.

ENGINEERS.**Atkinson, T. C.,**

Alexandria and Orange Railroad, Alexandria, Va.

Banks, C. W.,

Civil Engineer, Vicksburg, Miss.

Buckland, George,

Troy and Greenbush Railroad.

Clement, Wm. H.,

Little Miami Railroad, Cincinnati, Ohio.

Cozzens, W. H.,

Engineer and Surveyor, St. Louis, Mo.

Alfred W. Craven,

Chief Engineer Croton Aqueduct, New York.

Davidson, M. O.,

Eckhart Mines, Alleghany Co., Maryland.

Fisk, Charles B.,

Cumberland and Ohio Canal, Washington, D. C.

Felton, S. M.,

Fitchburgh Railroad, Boston, Mass.

Floyd-Jones, Charles,

South Oyster Bay, L. I.

Gzowski, Mr.,

St. Lawrence & Atlantic Railroad, Montreal, Canada.

Gilbert, Wm. B.,

Rutland and Burlington Railroad, Rutland, Vt.

Grant, James H.,

Nashville and Chattanooga R. R., Nashville, Tenn.

S. W. Hill,

Mining Engineer and Surveyor, Eagle River, Lake Superior.

Holcomb, F. P.

Southwestern Railroad, Macon, Ga.

Johnson, Edwin F.

New York and Boston Railroad, Middletown Ct.

Latrobe, B. H.,

Baltimore and Ohio Railroad, Baltimore, Md.

Miller, J. F.,

Worcester and Nashua Railroad, Worcester, Mass.

Morris, Elwood,

Schuylkill Navigation, Schuylkill Haven, Pa.

Morton, A. C.,

Atlantic and St. Lawrence Railroad, Portland, Me.

McRae, John,

South Carolina Railroad, Charleston, S. C.

Nott, Samuel,

Lawrence and Manchester Railroad, Boston.

Prichard, M. B.,

East Tennessee and Georgia R. R., Cleveland, Tenn.

Roebing, John A.,

Trenton, N. J.

W. Milnor Roberts,

Bellefontaine and Indiana Railroad, Marion, Ohio.

Roberts, Solomon W.,

Ohio and Pennsylvania Railroad, Pittsburgh, Pa.

Sanford, C. O.,

South Side Railroad, Virginia.

Schlatter, Charles L.,

Northern Railroad (Ogdensburg), Malone, N. Y.

Sours, Peter,

Rahway, New Jersey.

Stark, George.,

Boat, Con. and Mont. R. R., Meredith Bridge, N. H.

Steele, J. Dutton,

Pottstown, Pa.

Trautwine, John C.,

Panama Railroad—Address through office of Panama Railroad Co., 78 Broadway, N. Y.

Trimble, Isaac R.,

Philad., Wil. & Baltimore Railroad, Wilmington, Del.

Tinkham, A. W.,

United States Fort, Bucksport, Me.

Thomson, J. Edgar.,

Pennsylvania (Central) Railroad, Philadelphia.

Troost, Lewis,

Alabama and Tennessee Railroad, Selma, Ala.

Whipple, S.,

Civil Engineer and Bridge Builder, Utica, N. Y.

Williams, E. P.,

Auburn and Schenectady Railroad, Auburn, N. Y.

Williams, Charles H.,

Milwaukee, Wisconsin.

HOTELS.**Exchange Hotel,**

Adjoining Eastern Railroad Depot,

BUFFALO, N. Y.

BY.....**FISK & SPERRY,**
Late of Delevan House, Albany.**J. D. Abraham, Architect,**

NO. 300 MAIN STREET,

BUFFALO, N. Y.

Fountain Hotel,

LIGHT STREET, BALTIMORE,

P. THURSTON.....Proprietor.

DUNLAP'S HOTEL,

On the European Plan,

NO. 135 FULTON STREET,

Between Broadway and Nassau St.,
NEW YORK.**MANSION,**

Corner of Maine and Exchange Streets,

P. DORSHIMER. BUFFALO.

GUY'S**United States Hotel,**

(Opposite Pratt street Railroad Depot),

BALTIMORE.

JOHN GUY.

WILLIAM GUY.

American Hotel,

Pratt street, opposite the Railroad Depot,

BALTIMORE.

HENRY M. SMITH.....Proprietor.
Late of the Exchange & St. Charles Hotels, Pittsburgh.**Washington Hotel,**

BY JOHN GILMAN,

\$1 Per Day.

No. 206 Pratt street, (near the Depot),

BALTIMORE.

Barnum's City Hotel,

MONUMENT SQUARE, BALTIMORE.

This Extensive Establishment, erected expressly for a Hotel, with every regard to comfort and convenience, is situated in the centre and most fashionable part of the city, and but a few minutes' walk from the Railroad Depots and Steamboat Landings.

The House has lately undergone a thorough repair, embracing many valuable improvements, and will accommodate 250 Guests. **BARNUM & CO.****JONES' HOTEL,**

NO. 152 CHESTNUT STREET,

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BRIDGES & WEST, Proprietors.

BUSINESS CARDS.**Lithography.****JOHN P. HALL & CO.,**

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Are prepared to execute all kinds of Lithography in good style and at reasonable rates. Particular attention will be paid to Engraving Railroad Maps, Engineer's Plans and drafts, etc., and orders in this line are respectfully solicited.

J. T. Hodge

Will attend to the examination of mining tracts near Lake Superior, and prepare Reports and Maps.

Address, during the Summer,

Ontonagon Postoffice, Lake Superior.

Cumberland Steam Coal,

FROM THE

FROSTBURG MINES, MD.**H. A. TUCKER,**

Agent of Frostburg Coal Co.

No. 50 Wall Street, New York.

Eaton, Gilbert & Co.,

Railroad Car, Coach and Omnibus Builders,

TROY, N. Y.

Charles T. Jackson, M. D.,

STATE ASSAYER, late Geologist to Maine, Rhode Island, New Hampshire, and the United States, offers his services to his friends and the public in making any Chemical, Mineralogical or Geological researches that may be required for the improvement of Agriculture and the Manufacturing Arts. Particular attention will be paid to the exploration of mines and to assaying of ores of the metals.

State Assayer's office, 31 Somerset st.
Boston Sept. 3, 1850.**STEEL AND FILES.****R. S. Stenton,**

20 CLIFF STREET, NEW YORK,

AGENT FOR

J. & RILEY CARR,

BAILEY-LANE WORKS, SHEFFIELD,

Manufacturers of Cast, Shear, German, Blister, and

Spring Steel,

Of all descriptions, Warranted Good.

FILES.

Manufacturers of Machinists' Warranted Best Cast Steel Files, expressly for working upon Iron and Steel, made very heavy for recutting.

A full Stock of Steel and Files at all times on hand. 6m4

Walter R. Johnson,

CIVIL AND MINING ENGINEER AND ATTORNEY for Patents. Office and Laboratory, F St., opposite the Patent office, Washington, D. C.

Dudley B. Fuller & Co.,

IRON COMMISSION MERCHANTS,

No. 139 GREENWICH STREET,

NEW YORK.

Manning & Lee,

GENERAL COMMISSION MERCHANTS,

NO. 51 EXCHANGE PLACE,

BALTIMORE.

Agents for Avalon Railroad Iron and Nail Works, Maryland Mining Company's Cumberland Coal 'CED'—'Pitoma' and other good brands of Pig Iron.

Samuel Kimber & Co.,
COMMISSION MERCHANTS

WILLOW ST. WHARVES, PHILADELPHIA.

AGENTS for the sale of Charcoal and Anthracite Pig Iron, Hammered Railroad Car and Locomotive Axles, Force Pumps of the most approved construction for Railroad Water Stations and Hydraulic Rams, etc., etc.

July, 27, 1849.

James Herron, Civil Engineer,

OF THE UNITED STATES NAVY YARD,

PENSACOLA, FLORIDA,

PATENTEE OF THE

HERRON RAILWAY TRACK.

Models of this Track, on the most improved plans, may be seen at the Engineer's office of the New York and Erie Railroad.

PLUSHES

FOR

Railway Cars & Omnibuses.**F. S. & S. A. MARTINE,**
112 WILLIAM ST., NEAR JOHN.

ARE now receiving a large and complete assortment of Plain and Figured PLUSHES, of their own importation, which will be sold at the lowest market price, viz: Crimson, Maroon, Scarlet, Green, Blue, Purple, etc.

ALSO—CURLLED HAIR, the best manufactured in market.

To Railroad Companies, Machinists, Car Manufacturers, etc., etc.**CHARLES T. GILBERT,**
NO. 90 BROAD ST., NEW YORK.

IS prepared to contract for furnishing at manufacturer's prices—

Railroad iron,
Locomotive Engines,
Passenger and Freight Cars,
Car Wheels and Axles,
Chairs and Spikes.

Orders are invited; and all inquiries in relation to any of the above articles will receive immediate attention.

Manufacture of Patent Wire ROPE AND CABLES,

For Inclined Planes, Suspension Bridges, Standing Rigging, Mines, Cranes, Derrick, Tillers, &c., by
JOHN A. ROEBLING, Civil Engineer,
TRENTON, N. J.

FORGING.**Ranstead, Dearborn & Co.,**

MANUFACTURERS OF

LOCOMOTIVE CRANKS AND CAR AXLES,

ALSO

WROUGHT IRON SHAFTING,

And All Kinds of Hammered Shapes.

Office 25 Foster's Wharf, Boston.

Henry I. Ibbotson,

IMPORTER of Sheffield and Birmingham Goods.
Also, Agent for the Manufacture of Telegraph Wire.
218 PEARL ST., NEW YORK.

Cumberland, (Md.) Coals for Steaming, etc.

ORDERS RECEIVED FOR AND FILLED
by
J. COWLES, 27 Wall St., N. Y.

Samuel D. Willmott,

MERCHANT, AND MANUFACTURER OF
CAST STEEL WARRANTED SAWS,
—AND FILES—

IMPORTER OF THE

GENUINE WICKERSLY GRINDSTONES
NO. 8 LIBERTY STREET,
NEW YORK.

Railroad Instruments.

THEODOLITES, TRANSIT COMPASSES,
and Levels, with Fraunhoffer's Munich Glasses,
Surveyor's Compasses, Chains, Drawing Instruments,
Barometers, etc., all of the best quality and
workmanship, for sale at unusually low prices, by
E. & G. W. BLUNT,

No. 179 Water St., cor. Burling Slip,
New York, May 19, 1849.

IRON.**Stickney & Beatty,**
DEALERS IN IRON AND IRON
MANUFACTURERS.

AGENTS for the Balt. City Rolling Mill, from which establishment they are prepared to furnish Ellicott's round, square, and flat bar iron, puddled and charcoal boiler plates and billet iron—also agents for the sale of the Laurel, Gunpowder and Locust Grove (Balt.) forge pig irons, Locust Grove and Laurel Irons for car wheels, Caledonian boiler blooms made from cold blast iron, Old Colony and anti-Eatam nails, Wm. Jessop & Son's steel, Coleman's blister steel and nail rods, sheet, hoop, band, oval and common English iron.

No. 18 and 20 South Charles st., Baltimore.

Car Wheel Iron.

100 Tons "Columbia" No. 2 Cold Blast Charcoal
Iron.

300 Tons "Salisbury" No. 1, do. do.

For sale by **CHARLES T. GILBERT,**
No. 90 Broad st.

New York, Sept. 21, 1850.

Railroad Spikes.

THE subscribers are prepared to make and execute contracts for Railroad Spikes of a superior quality, manufactured by the New Jersey Iron Company, at Boonton. **DUDLEY B. FULLER & CO.**
139 Greenwich st. corner of Cedar.

Railroad Iron.

1650 Tons, weighing about 61 lbs. per yard, 40 tons, weighing about 52 lbs. per yard, and 825 tons, weighing about 53½ lbs. per yard, of the latest and most approved patterns of T rail, for sale by
BOORMAN, JOHNSTON & CO.,
119 Greenwich street.

New York, Aug. 26, 1850.

N.B.—B. J. & Co are also prepared to take contracts for English rails, delivered in any of the Atlantic ports of the United States.

Railroad Iron.

THE Undersigned, Agents for Manufacturers, are prepared to contract to deliver Rails of superior quality, and of any size or pattern, to any ports of discharge in the United States.

COLLINS, VOSE & CO.
74 South St.

New York, June 1, 1850.

Railroad Iron.

1,500 Tons weighing 59 lbs. per lineal yard.

500 " " 57 " " "

500 " " 56 " " "

500 " " 60 & 61 lbs. "

Also 2½ flat rails. All the above being of approved patterns. For sale by

DAVIS, BROOKS, & CO.,
68 Broad street.

N.B.—Rails imported on commission, or at a fixed price.

Iron.

Pig Iron, Anthracite and Charcoal; Boiler and Flue Iron, Spring and Blistered Steel, Nail Rods, Best Refined Bar Iron, Railroad Iron, Car Axles, Nails, Stove Castings, Cast Iron Pipes of all sizes, Railway Chains of approved patterns for sale by
COLEMAN, KELTON & CAMPBELL,
109 N. Water St., Philadelphia.

Railroad Iron.

THE UNDERSIGNED, HAVING made arrangements abroad, are prepared to contract for the delivery of Foreign rails, of approved brands upon the most favorable terms.

They will also make contracts for American rails, made at their Trenton works, from Andover Iron, in whole or in part, as may be agreed upon.

They are prepared to furnish Telegraph, Spring and Market Wire; Braziers and Wire Rods; Rivets and Merchant Bars to order, all made exclusively from Andover Iron. The attention of parties who require iron of the very best quality for special purposes, is respectfully invited.

COOPER & HEWITT,
17 Burling Slip, New York.

February 15, 1850.

Railroad Iron.

THE Undersigned, Agents for Manufacturers, are prepared to contract for the delivery of English, Welsh and Scotch Rails, of any pattern and weight, also for every description of English, Welsh, Scotch, and Swedish Iron, Railway Chairs and Spikes, Rivets, Bolts, Nuts, Washers, Chain Cables, Anchors, Tin Plates, German Spelter, Iron Castings, and every description of Machinery.

WILLIAM BIRD & CO.,
Iron and Tin Plate Merchants,
44 Wall st., New York.

And at 5 Martin's Lane, City, London,
and 140 Buchanan st., Glasgow.

July 27th, 1850.

Railroad Iron.

THE Undersigned are prepared to contract for the delivery of superior make Welsh Railroad Iron of the favorite brand "Aberdare."

JOSEPH BRAMWELL & CO.,
91 Wall street.

40

Glendon Refined Iron.

Round Iron, Band Iron, Hoop Iron,
Square " Flat " Scroll "

Axles, Locomotive Tyres,
Manufactured at the Glendon Mills, East Boston, for
sale by **GEORGE GARDNER & CO.,**
5 Liberty Square, Boston, Mass.

Sept. 15, 1849. 3m37

PATENT HAMMERED RAILROAD, SHIP & BOAT SPIKES.—The Albany Iron Works have always on hand, of their own manufacture, a large assortment of Railroad, Ship and Boat Spikes from 2 to 12 inches in length, and of any form of head. From the excellence of the material always used in their manufacture, and their very general use for railroads and other purposes in this country, the manufacturers have no hesitation in warranting them fully equal to the best spikes in market, both as to quality and appearance. All orders addressed to the subscribers at the works will be promptly executed.

JOHN F. WINSLOW, Agent.

Albany Iron and Nail Works, Troy, N. Y.
The above Spikes may be had at first prices, of
Erastus Corning & Co Albany; Menitt & Co., New York; E. Pratt & Br. Inc. Es. Md.

**LAP—WELDED
WROUGHT IRON TUBES**

FOR

TUBULAR BOILERS,

FROM ONE AND A QUARTER TO SEVEN
INCHES IN DIAMETER.

THE ONLY Tubes of the same quality and manufacture as those so extensively used in England, Scotland, France and Germany, for Locomotive, Marine and other Steam Engine Boilers.

THOMAS PROSSER & SON, Patentees,
28 Platt street, New York.

Railroad Iron.

THE UNDERSIGNED ARE PREPARED TO contract for the delivery of English Railroad Iron of favorite brands, during the Spring. They also receive orders for the importation of Pig, Bar, Sheet, etc. Iron.

THOMAS B. SANDS & CO.,

73 New street,
New York.

February 3, 1849.

Iron Store.

THE Subscribers, having the selling agency of the following named Rolling Mills, viz: Norristown, Rough and Ready, Kensington, Triadelphia, Pottsgrove and Thorndale, can supply Railroad Companies, Merchants and others, at the wholesale mill prices for bars of all sizes, sheets cut to order as large as 58 in. diameter; Railroad Iron, domestic and foreign; Locomotive tire welded to given size; Chairs and Spikes; Iron for shafting, locomotive and general machinery purposes; Cast, Shear, Blister and Spring Steel; Boiler rivets; Copper; Pig iron, etc., etc.

MORRIS, JONES & CO.,

Iron Merchants,
Schuylkill 7th and Market Sts., Philadelphia.
August 16, 1849. 1y33

Railroad Iron.

THE MOUNT SAVAGE IRON WORKS, Allegheny county, Maryland, having recently passed into the hands of new proprietors, are now prepared, with increased facilities, to execute orders for any of the various patterns of Railroad Iron. Communications addressed to either of the subscribers will have prompt attention. **J. F. WINSLOW, President**
Troy, N. Y.

ERASTUS CORNING, Albany
WARREN DELANO, Jr., N. Y.
JOHN M. FORBES, Boston.
ENOCH PRATT, Baltimore, Md.

November 6, 1848.

Railroad Iron.

THE SUBSCRIBERS ARE PREPARED TO take orders for Railroad Iron to be made at their Phoenix Iron Works, situated on the Schuylkill River, near this city, and at their Safe Harbor Iron Works, situated in Lancaster County, on the Susquehanna river; which two establishments are now turning out upwards of 1800 tons of finished rails per month.

Companies desirous of contracting will be promptly supplied with rails of any required pattern, and of the very best quality.

REEVES, BUCK & CO.,
45 North Water St. Philadelphia.

March 15, 1849.

Tredegair Iron Works.

ROLLING MILL FOUNDRY AND MACHINE SHOPS. The undersigned continues to manufacture at his Works in this city (from best charcoal metal) Bar Iron of every description, embracing—Rounds and Squares, from $\frac{1}{4}$ to 5 inches diameter. Flats, from $\frac{1}{4}$ to 7 inches, all thicknesses. Bands and Scrolls, all sizes. Boiler plate and Plough Iron. Railroad and Locomotive Axles and Tires. Locomotive Frames, Spikes and Plates. Hoops, Ovals, Half Ovals, Half Rounds, Angle, T, L, and indeed every description of Iron usually manufactured, all of which he warrants to be equal to any made in this country. He also manufactures at his Foundry and Machine Shops all descriptions of Railroad Work, say, Locomotives, Railroad Wheels and Axles complete and ready for the road, Railroad Chairs, etc. Also, Marine and Stationary Engines all sizes, Sugar mills and Engines, Horse mills, and every kind of Machinery usually required for the operations of the country. He has paid particular attention to getting up machinery, etc., for Gold Mine operations, and those in want of such work might find it to their advantage to give him a call.

J. R. ANDERSON.
Richmond, Va., Sept. 10, 1850.

CUT NAILS OF BEST QUALITY, BAR IRON (including Flat Rails) manufactured and for sale by
FISHER, MORGAN & CO.,
75 N. Water St., Philadelphia.

Wheel, Forge and Foundry Iron.

LOCUST GROVE Wheel Iron of great strength and superior chilling property. Balt. Charcoal Forge Iron, from Patuxent, Curtis Creek and Gunpowder furnaces. Elkridge Foundry Iron, of superior strength and softness. Anthracite and Charcoal Iron from Pennsylvania and Virginia. Gas and Water Pipes, Lamp Posts from Elkridge furnace.

LEMMON & GLENN,
62 Buchanan's Wharf, Baltimore.

S. S. Keyser & Co., IRON WAREHOUSE,

Corner of South and Pratt Streets,
BALTIMORE, MD.

Selling Agents for the Rough and Ready Bar Iron and Elk Boiler and Flue Iron Rolling Mills, Sarah and Taylor Furnaces, and Wrightsville Hollow Ware Foundry, and Dealers in Bar and Sheet Iron, and Cast, Sheer, German, Blister, Spring and Electroplated Steel, etc., etc.

Smith & Tyson,

GENERAL COMMISSION MERCHANTS,
No. 25 South Charles St., Baltimore, Md.

AGENTS for the Celebrated Columbia Pig Iron, suitable for Car Wheels and Chilled Rolls. Columbia refined Charcoal Blooms; Refined Charcoal Juniatta Billet Iron for Wire; Refined Iron for Bridging, of great strength; Cut Nails, Spikes, and Brads; Railroad Spikes and Wrought Chairs. 22tf

Railroad Iron.

CONTRACTS made by the subscribers, agents for the manufacturers, for the delivery of Railway Iron, at any port in the United States, at fixed prices, and of quality tried and approved for many years, on the oldest railways in this country.

RAYMOND & FULLERTON, 45 Cliff st.

JOHNSON, CAMMELL & Co's Celebrated Cast Steel,

AND ENGINEERING AND MACHINE FILES, which for quality and adaptation to mechanical uses, have been proved superior to any in the United States. Every description of square, octagon, flat and round cast steel, sheet, shovel and railway spring steel, best double and single shear steel, German steel, flat and square, goat stamps, etc. Saw and file steel, and steel to order for any purposes, manufactured at their Cyclops Steel Works Sheffield.

JOHNSON, CAMMELL & CO.,
100 William St., New York.

November 23 1843.

Bowling Tire Bars.

40 Best Flange Bars 5 $\frac{1}{2}$ x2 inches, 11 feet long.
40 " " 5 $\frac{1}{2}$ x2 " 7 feet 8 in. long.
40 " Flat " 6x2 " 11 feet long.
40 " " 6x2 " 7 feet 8 in. long.

Now in store and for sale by
RAYMOND & FULLERTON,
45 Cliff street.

IRONDALE PIG METAL, MANUFACTURED and for sale by the Bloomsburg Railroad Iron Co.
LINDLEY FISHER, Treasurer.
75 N. Water St., Philadelphia.

Railroad Iron.

2000 Tons, weighing 58 pounds per lineal yard, of the most approved pattern of T rails, in store and to arrive, for sale by

COLLINS, VOSE & CO.,
74 South St.

New York, June 1, 1850.

Railroad Iron.

3,000 TONS C. L. MAKE 6 $\frac{1}{2}$ lbs. per yard, now landing and to arrive.

Also contracts made for future delivery of above superior make English Iron.

300 Tons Banks Best Iron, Round, Square and Flat.
200 " English Bar " " " "

10 " 9-16 Square Iron for Railroad Spikes.

For sale in lots to suit purchasers by
DAVID W. WETMORE.

New York, March 26, 1850.

WILLIAM JESSOP & SONS' CELEBRATED CAST-STEEL.

The subscribers have on hand, and are constantly receiving from their manufactory.

PARK WORKS, SHEFFIELD,
Double Refined Cast Steel—square, flat and octagon.

Best warranted Cast Steel—square, flat and octagon. Best double and single Shear Steel—warranted.

Machinery Steel—round.
Best and 2d gy. Sheet Steel—for saws and other purposes.

German Steel—flat and square, "W. I. & S." "Eagle" and "Goat" stamps.

Genuine "Sykes," L Blister Steel.

Best English Blister Steel, etc., etc., etc.

All of which are offered for sale on the most favorable terms by

WM. JESSOP & SONS,
91 John street, New York.

Also by their Agents—

Curtis & Hand, 47 Commerce street, Philadelphia.
Alex'r Fullerton & Co., 119 Milk street, Boston.

Stickney & Beatty, South Charles street, Baltimore.
May 6, 1848.

Railroad Iron.

B. O. Railway Tires, Railway Wheels,
Scotch Pig Iron, Tin Plates and Banca Tin,

Muntz Patent Metal Sheathing,
Baltimore Copper.

Contracts for Rails made on behalf of the manufacturers, for delivery at any ports in the United States, at fixed prices.

Bowling Tires and Tire Bars and Scotch Pigs imported to order.

Muntz's Ship-sheathing, and a general stock of Tin Plates and Banca Tin in store, and for sale by

RAYMOND & FULLERTON, 45 Cliff st.

Bowling Iron. Stamped B.O.

Railway Tire Bars Rivet Iron
Locomotive and other Axles Locomotive Frame do
Boiler Plates Bars,

and every other description of this superior Iron.

The subscribers, agents for the sale of Bowling Iron, are prepared to execute orders for importation, especially for railway and machinery uses, with despatch from the manufacturers.

RAYMOND & FULLERTON, 45 Cliff st.

Lovegrove's Patent Cast Iron Water and Gas Pipes.

THE Subscriber, the Inventor and Patentee of the Centrifugal mode of giving form to metallic substances while in a molten state, is preparing to make Cast Iron Water and Gas Pipes, of any dimensions, at prices much lower than they can be made in the old manner, and the pipes warranted to stand a pressure of three hundred pounds to the square inch, and to be soft enough to drill. Steam Engines and all kinds of machinery. Cast Iron Doors and Frames, and Mill Castings of every description, made to order.

THOMAS J. LOVEGROVE,
Machinist and Founder,
West Falls Avenue, below Pratt st., Baltimore.

Railroad Iron.**SPIKES.**

Wrought Iron CHAIRS, New Pattern.

THE Undersigned continues to contract, as usual, for the above articles. The reputation already acquired for their excellent quality is a guarantee that strict attention shall continue to be paid to the wants and interests of purchasers.

CHARLES ILLIUS,
20 Beaver St., New York.

Ray's Patent India Rubber Car Springs.

Savannah, Ga., May 22, 1850.

FOWLER M. RAY, Esq.,

Dear Sir: I have no hesitation in saying, after having used on our road your springs and Fuller's, that I consider yours decidedly the best in every particular, and in this opinion I am sustained by all our officers. Fuller's spring has a tendency to split, and also to chafe or abrade by the constant friction on the cast iron plates or disc: and in my opinion is not near so elastic as yours.

Your springs, which have been in use on our road for 12 or 15 months past, and in constant use under both passenger and freight cars, are to all appearances as elastic, sound and good, as when first put in use.

We are now building eighty-five new cars, of which for fifty-sets the springs have been ordered of you.

GEORGE A. ADAMS,

Master Carpenter,

Central Railroad and Banking Co. of Georgia.

Connecticut River Railroad Office,
Northampton, May 4, 1850.

E. CRANE, Esq.,

Dear Sir: It is now about two years since I first tried the experiment of using a set of Ray's India-rubber Springs upon one of our merchandise cars, and although the car has been in constant service since that time, I do not on examination find the slightest difference either in the thickness or elasticity of the material.

The same result has followed wherever we have applied them, either for wheel or draw springs on Engines, Tenders or Cars. At present we use no other; either in replacing old springs or building new cars—and I am perfectly satisfied that for economy, durability, safety, and ease of motion, that Ray's India-rubber is the best article for Springs which has been presented to the public.

Yours respectfully, **J. HUNT,**
Supt. Connecticut River Railroad.

EDWARD CRANE, Esq.,

Dear Sir: Having applied to cars of the Boston and Worcester Railroad Corporation, Ray's Vulcanised Rubber Springs (where they have been in use for some two years last past), I have had occasion to observe their operation, and am free to say in answer to your inquiries, that they retain their elasticity perfectly during all changes of atmospheric temperature; and are in my opinion a most valuable acquisition to Railroad Cars—are not liable to derangement, as is the case with steel springs; while at the same time it costs less to apply them. Respectfully yours,

D. N. PICKERING,
Supt. Motive Power, Bost. & Wor. Railroad.
Boston, April 15th, 1850.

**EMERSON'S****PATENT****CORRESPONDING VENTILATORS;**

For Ships, Steamers, etc.,

Manufactured by

CHILSON, ALLEN, WALKER & CO.,
351 Broadway, New York.

TO RAILROAD COMPANIES, CAR MANUFACTURERS, etc.

THE Undersigned hereby gives public notice, that the Commissioner of Patents, pursuant to his decision in relation thereto, on the 8th day of October, 1850, issued to him a Patent for the sole right to manufacture, and exclusive use of the INDIA RUBBER CAR SPRING, on account of priority of invention of said Spring.

F. M. RAY
New York, Oct. 23, 1850.

RAILROAD CAR MANUFACTORY**TRACY & FALES,**

GROVE WORKS, HARTFORD, CONN.

Passage, Freight and all descriptions of

RAILROAD CARS,

AS WELL AS

LOCOMOTIVE TENDERS,

Made to order promptly.

The above is the Largest Car Factory in the Union. In quality of Material, and in Workmanship, Beauty and Good Taste, as well as Strength and Durability, we are determined our work shall be unsurpassed.

JOHN R. TRACY. THOS. J. FALES.

Monument Foundry.

A. & W. DENMEAD & SON,
Corner of North and Monument Sts.,—Baltimore,
HAVING THEIR

IRON FOUNDRY AND MACHINE SHOP

"In complete operation, are prepared to execute faithfully and promptly, orders for Locomotive or Stationary Steam Engines, Woolen, Cotton, Flour, Rice, Sugar Grist, or Saw Mills, Slide, Hand or Chuck Lathes, Machinery for cutting all kinds of Gearing, Hydraulic, Tobacco and other Presses, Car and Locomotive patent Ring Wheels, warranted, Bridge and Mill Castings of every description, Gas and Water Pipes of all sizes, warranted, Railroad Wheels with best fagotted axle, furnished and fitted up for use, complete

Being provided with Heavy Lathes for Boring and Turning Screws, Cylinders, etc., we can furnish them of any pitch, length or pattern.

Old Machinery Renewed or Repaired—and Estimates for Work in any part of the United States furnished at short notice.

June 8, 1849.

**RAILROAD CAR
AND COACH TRIMMINGS.**
Doremus & Nixon,
IMPORTERS AND FURNISHERS

Plain Garnet Plush. Fig. Garnet Plush (Butterfly pat.
"Crimson" "Crimson" (Elegant.
"Scarlet" " " (Gen. Taylor.

BROCATELLES.

Crimson Silk Brocatelles. Gold and Maroon do.
Gold and Blue " " Brown " "
Silk and Wool " " of every color.

MOQUETTES,

Of elegant designs and colors.

GERMAN CLOTH FOR CAR LININGS.

The most beautiful goods ever shown in this country, and the subscribers are the sole agents for the sale of them.

Oil cloths Enamelled with Gold. These goods can be
" " Silver. furnished in any
Do. Silver ground velvet printed. dimensions req'd.

CURLED HAIR

Of every description and quality.

JNO. W. A. STRICKLAND, Agent.
New York, 1850. 1yl6

**FOWLER M. RAY'S
Patent India-rubber Railroad
CAR SPRING.**

New York and Erie Railroad Shops.
Piermont, March 26, 1850.

This will certify that from practical experience in the use of Fowler M. Ray's India rubber Car Springs, I believe them to be far superior to any others now in use.

I have never known them to be affected by any change of temperature, as other Rubber Springs have been affected on this road.

I am at the present time repairing a Passenger Car that Mr. Ray and myself mounted with his springs about two years and eight months since.

The springs are at the present time as perfect, to all appearances, as when first applied to the car.

Respectfully yours,

HORACE B. GARDNER,
Foreman of the Car Shops.

Supt. Office N.Y. & H. R.R.,
New York, March 8, 1850.

This is to certify that we have used the Rubber Springs manufactured by Mr. F. M. Ray for the past twenty months, "both for Passenger and Freight Car Springs and Bumpers, and of different sizes," and have in every case given entire satisfaction, and I consider them the best spring now in use

M. SLOAT, Supt.

Boston, March 5, 1850.

In answer to your enquiry about India-rubber Springs, I have to say that we have used them to a considerable extent on both freight and passenger cars, and also on several of our tenders; and I am very well satisfied that they answer all the purposes for which they are intended. I believe the India-rubber will soon supersede all other springs for cars and tenders.

Yours truly,

S. M. FELTON,
Supt. Fitchburg Railroad.

Office New Jersey Railroad Co.,
Jersey City, March 8, 1850.

FOWLER M. RAY, Esq.,

Dear Sir: In answer to your enquiries respecting the operation of the Vulcanised Rubber Springs, purchased by our company from you some two years since, I reply that they are superior to any spring in use, (that I have either seen or heard of).

The improved form of your spring, consisting of a solid piece of vulcanised rubber with bands on the outside, is far superior to your first form, consisting of disks of rubber with metallic plates interposed.

The last named form was tried, if you recollect, at a much earlier period; and then was replaced by your last form.

I have no hesitation in saying that your springs have given entire satisfaction, and most cheerfully recommend them to railroad companies throughout the country for the following reasons:

1st. The cost is 30 per cent. less.
2d. Saving of weight on each car of 8 wheels from 700 to 800 lbs.

3d. Less care and attention is required, as they are not liable to get out of repair.

4th. A great saving is secured in the wear and tear of the cars and rails from their great elasticity.

5th. The freedom from noise.

6th. There is greater safety in case of accident, as they cannot be broken.

7th. The comfort of passengers is enhanced sufficiently to pay the expense, waiving all the other reasons that I have given.

Should this fail to satisfy any person enquiring, you are at liberty to refer to me, No. 150 Washington St., Jersey City. Yours respectfully,

T. L. SMITH, Supt.

New York, March 11, 1850.

I have used the Patent India-rubber Spring purchased of Mr. Ray, upon the cars of the New York and New Haven Railroad, and have found them efficient and economical; and when applied to the axles and draw springs, believe them to be quite equal to any in use. I have found a combination of these springs with a steel spring under the transom beam a very satisfactory arrangement, and am now using this plan in all new cars.

Yours respectfully,
ROBERT SCHUYLER.

February 25, 1850.

From practical observation of the use of the India-rubber Car Springs, manufactured and sold by your company, we are entirely satisfied in their application, and do not hesitate to recommend them as elastic, durable, requiring no repairs for years, and retaining their consistency during all extremes of weather. We have applied them for the past two years, and consider them superior for all railroad purposes.

Yours truly,

OSGOOD BRADLEY, Car Builder, Worcester.
T. & C. WASON, do. Springfield.
DEAN, PACKARD & MILLS, do. do.
DAVENPORT & BRIDGES, do. Cambridgeport.

Office of the New Jersey Railroad Co.,
Jersey City, March 7, 1850.

This is to certify that we have had Mr. F. M. Ray's India-rubber Springs in constant use under our cars, and as Bumper Springs for upwards of two years, and they have in every way given perfect satisfaction.

The present form of spring we deem far superior to the form of Disk, having used both forms, although we have none of those made in Disks at present in use.

We take pleasure in recommending these springs to all railroad companies.

J. P. JACKSON, Vice Prest.
New Jersey Railroad and Trans. Co.

Roxbury, February 28, 1850.

In compliance with your request, I take great pleasure in stating the result of my experience in the use of "Ray's Patented Vulcanised India-rubber Car and Engine Springs." We have used them nearly two years, and never had one fail in any way. The cold weather does not affect them, as it has other rubber springs we have used.

With sixteen years' experience as superintendent of machinery on the Boston and Providence railroad, I take pleasure in saying that your springs are the best we ever used, or I ever saw used elsewhere. We have 20 cars rigged with them, of which I can say that the springs are as good now as when first applied. I put 24 lbs. of the rubber under the forward end of one of our heaviest engines, taking off 250 lbs. of steel springs—it has been in use 18 months, and is in as good condition now as when first put under the engine.

Very respectfully yours,

GEO. S. GRIGGS,
Supt. of Machinery, Boston and Prov. R.R.

Fall River, February 2, 1850.

In answer to yours of the 20th ult. I would say that this company has for some 10 or 12 months past been using "Ray's India-rubber Springs." We have applied them to both passenger and freight cars with uniform success. They have invariably preserved their elasticity and consistency through all the extremes of weather; and we are now applying them whenever the steel spring fails. I am well satisfied that they are particularly adapted for railroad purposes.

Very respectfully yours,

GEO. HAVEN,
Supt. Fall River Railroad.

Jersey City, March 9, 1850.

This is to certify that the present form of Mr. F. M. Ray's India-rubber Car Spring I consider far superior to the form of Disk, having used both forms.

I take pleasure in recommending these springs to all railroad companies.
DAVID H. BAKER,
Foreman of Car Shop of N.J. R.R. & Trans. Co.

Harlem R.R. Depot,
New York, March 7, 1850.

This is to certify that we have used Mr. F. M. Ray's India-rubber Springs for over eighteen months, and find them to be easy and durable, and recommend them to railroad companies as being superior to anything we have tried.

J. M. SMART,
Foreman at 42d St. Depot.

Old Colony Railroad Office,
Boston, March 6, 1850.

EDWARD CRANE, Esq.,

President New England Car Co.,

Dear Sir: In compliance with your request I would state that the Old Colony Railroad Comp'y have had in use upon their road, India-rubber Springs furnished by your company, for more than eighteen months past, during which time they have been extensively used under Passenger and Freight Cars, Locomotive Tenders, and for Drawer and Buffering Springs, with the most perfect success. The elasticity and consistency of the Rubber has never been unfavorably affected by either extremes of heat or cold—and from the experience which we have had in the use of Rubber Springs, I think them well adapted for railroad purposes—and therefore we have for some months past used Rubber almost exclusively, in all places where springs are required.

Respectfully yours, etc.,

JAS. H. MOORE,
Supt. O. C. Road.

Troy, February 27, 1850.

We have been using your India-rubber Car Springs for nearly two years—and we take pleasure in saying that in our opinion the rubber has to a certain extent already, and may eventually entirely supersede all other Springs for Railroad Car purposes. We now use it entirely for Draw Springs and Bumpers, considering it better and lighter than steel.

During our two years' experience in the use of it, we have not known any to lose their elasticity, or fail in any way; and we cheerfully recommend the rubber for railroad car springs. Very respectfully,

EATON, GILBERT & CO.

Passenger Car Linings.

THE Advertiser continues to make to order the Enamelled Car Linings which have been so highly approved the last three years, and are now exclusively used by all the Northern Railroads. No pains are spared to get out new styles, and adapt them to the tastes of every consumer.

Orders addressed to **CHARLES STODDER, No. 75 Kilby street, Boston,** will have prompt attention.
March 23, 1850. 2m

India-rubber for Railroad Cos.

RUBBER SPRINGS—Bearing and Buffer—Fowler's Patent—Hose from 1 to 12 inches diameter. Suction Hose. Steam Packing—from 1-16 to 2 in. thick. Rubber and Gutta Percha Bands. These articles are all warranted to give satisfaction, made under Tyer & Helm's patent, issued January, 1849.—No load used in the composition. Will stand much higher heat than that called "Goodyear's," and is in all respects better than any in use. Proprietors of railroads do not be overcharged by pretenders.

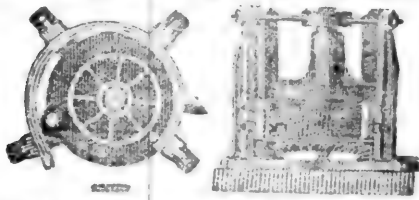
HORACE H. DAY,
Warehouse 23 Courtlandt street,
New York, May 21, 1849.

Spikes, Spikes, Spikes.

ANY person wishing a simple and effective Spk Machine, or a number of them, may be supplied by addressing
J. W. FLACK,
Troy, N. Y.
March 6, 1850.

MACHINERY.

Henry Burden's Patent Revolving Shingling Machine.



THE Subscriber having recently purchased the right of this machine for the United States, now offers to make transfers of the right to run said machine, or sell to those who may be desirous to purchase the right for one or more of the States.

This machine is now in successful operation in ten or twelve iron works in and about the vicinity of Pittsburgh, also at Phoenixville and Reading, Pa., Covington Iron Works, Md., Troy Rolling Mills, and Troy Iron and Nail Factory, Troy, N. Y., where it has given universal satisfaction.

Its advantages over the ordinary Forge Hammer are numerous: considerable saving in first cost; saving in power; the entire saving of shingler's, or hammerman's wages, as no attendance whatever is necessary, it being entirely self-acting; saving in time from the quantity of work done, as one machine is capable of working the iron from sixty puddling furnaces; saving of waste, as nothing but the scoria is thrown off, and that most effectually; saving of staffs, as none are used or required. The time required to furnish a bloom being only about six seconds, the scoria has no time to set, consequently is got rid of much easier than when allowed to congeal as under the hammer. The iron being discharged from the machine so hot, rolls better and is much easier on the rollers and machinery. The bars roll sounder, and are much better finished. The subscriber feels confident that persons who will examine for themselves the machinery in operation, will find it possesses more advantages than have been enumerated. For further particulars address the subscriber at Troy, N. Y. P. A. BURDEN.

Railroad Spikes and Wrought Iron Fastenings.

THE TROY IRON AND NAIL FACTORY, exclusive owner of all Henry Burden's Patented Machinery for making Spikes, have facilities for manufacturing large quantities upon short notice, and of a quality unsurpassed.

Wrought Iron Chairs, Clamps, Keys and Bolts for Railroad fastenings, also made to order. A full assortment of Ship and Boat Spikes always on hand.

All orders addressed to the Agent at the Factory will receive immediate attention.

P. A. BURDEN, Agent,
Troy Iron and Nail Factory, Troy, N. Y.

CHILLED RAILROAD WHEELS.—THE UNDERSIGNED are now prepared to manufacture their Improved Corrugated Car Wheels, or Wheels with any form of spokes or discs, by a new process which prevents all strain on the metal, such as is produced in all other chilled wheels, by the manner of casting and cooling. By this new method of manufacture, the hubs of all kinds of wheels may be made whole—that is, without dividing them into sections—thus rendering the expense of banding unnecessary; and the wheels subjected to this process will be much stronger than those of the same size and weight, when made in the ordinary way.

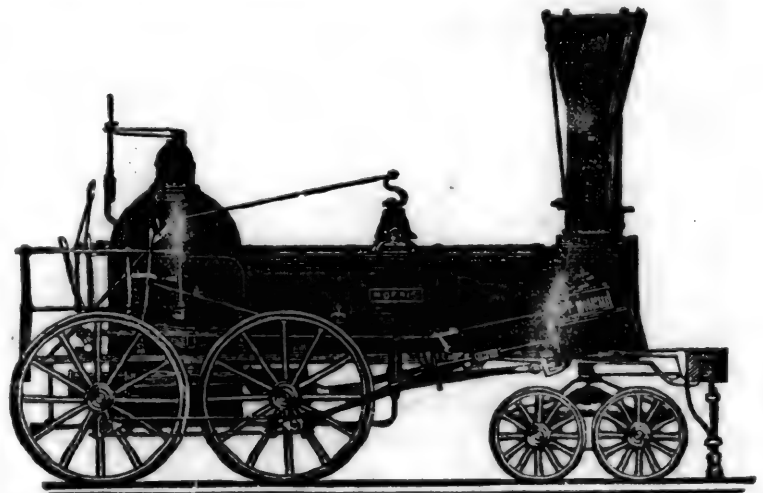
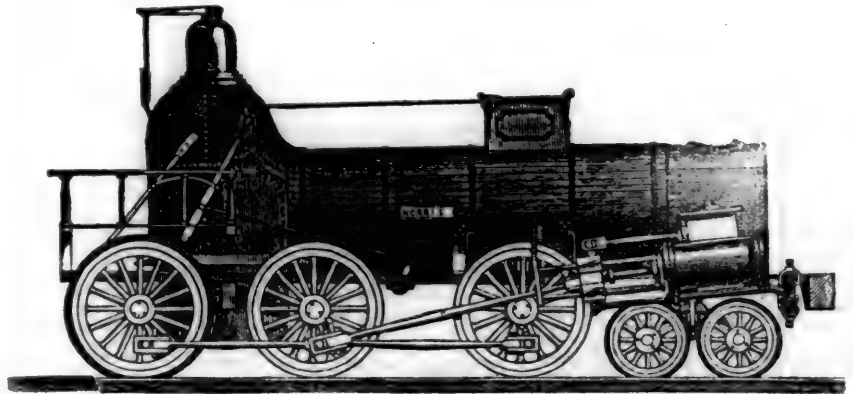
A. WHITNEY & SON,
Willow St., below 13th,
Philadelphia, Pa.

Brown's Old Established SCALE WARE HOUSE,
NO. 24 WATER ST., NEW YORK.

THE Subscriber, Practical Manufacturer of Scales of every description, respectfully asks the attention of Railroad Companies to his Improved Wrought Iron Railroad Track and Depot Scales which for strength, durability, accuracy, convenience in weighing, and beauty of workmanship, are not surpassed by any others in this country.

He is aware that this is rather a bold assertion for him to make, yet he can say with confidence that they have but to be tried to give them precedence over all others.

J. L. BROWN.
Bank Scales made to order, and all Scales of his make Warranted in every particular.
References given if required

NORRIS' LOCOMOTIVE WORKS.
BUSHHILL, SCHUYLKILL SIXTH-ST., PHILADELPHIA,

THE UNDERSIGNED Manufacture to order Locomotive Steam Engines of any plan or size. Their shops being enlarged, and their arrangements considerably extended to facilitate the speedy execution of work in this branch, they can offer to Railway Companies unusual advantages for prompt delivery of Machinery of superior workmanship and finish.

Connected with the Locomotive business, they are also prepared to furnish, at short notice, Chilled Wheels for Cars of superior quality.

Wrought Iron Tyres made of any required size—the exact diameter of the Wheel Centre, being given, the Tyres are made to fit on same without the necessity of turning out inside.

Iron and Brass castings, Axles, etc., fitted up complete with Trucks or otherwise.

NORRIS, BROTHERS

PATENT MACHINE MADE HORSE-SHOES.

The Troy Iron and Nail Factory have always on hand a general assortment of Horse Shoes, made from Refined American Iron.

Four sizes being made, it will be well for those ordering to remember that the size of the shoe increases as the numbers—No. 1 being the smallest.

P. A. BURDEN, Agent,
Troy Iron and Nail Factory, Troy, N. Y.

Etna Safety Fuse.

THIS superior article for igniting the charge in wet or dry blasting, made with DUPONT'S best powder, is kept for sale at the office and depot of

REYNOLDS & BROTHER,

Manufacturers,
No. 85 Liberty St.
NEW YORK.

And in the principal cities and towns in the U. States.
The Premium of the AMERICAN INSTITUTE was awarded to the Etna Safety Fuse at the late Fair held in this city.
November 3, 1849.

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COLUMBUS, OHIO,
Railroad Car Manufactory.
RIDGWAYS & KIMBALL,

HAVE established at this central point, the manufacture of Passenger, Freight, Gravel and Hand Cars for Railroads, and assure all Western Railroad Companies that it will be their constant aim to procure the best materials and workmen, and to turn out the best kind of work at fair prices. Specimens may be seen on the Columbus and Xenia Railroad. The patronage of Railroad Companies is respectfully solicited.

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FOR SALE.

THREE LOCOMOTIVES, Manufactured by M. W. Baldwin, of 10 tons weight, all in complete repair, and now running on the Columbia and Philadelphia Railroad.

For particulars apply to A. L. Roumfort, Supt. of said road, either at Philadelphia, or Parkersburg, Chester county.

A. L. ROUMFORT,
Supt. Motive Power Col. & Philad. R.R.

The Revised Statutes of Maine, ch. 81, provide that no railroad charter shall be granted till the line has been carefully surveyed, and the proper plans, profiles and estimates thereof duly exhibited. But, in this instance, all these requirements were waived; and the Hon. George M. Chase, of Calais,

introduced into the Senate of Maine, by unanimous consent, the Bill for incorporating the European and North American Railway; which Bill became a Law, August 20, 1850. The Charter is one of un-qualified liberality, and such as has not before been granted in New England; perpetual in duration, not subject to Legislative alteration; the company not subject to any taxation, and the stockholders are not liable for the debts of the company beyond the assessments on their stock. The company may organise on the subscription of one million of dollars, and locate its line on the most practical route to the boundary of Maine, in the general direction of the city of St. John.

By a subsequent Act, approved August 27th, it is provided that, in case said company shall be constituted a corporation in the Provinces of New Brunswick and Nova Scotia, or either of them, then and in that case, the company may increase its capital stock to an amount sufficient to complete the line through said Provinces, not exceeding \$15,000,000. By the laws of Maine, the company has the right to issue bonds and to hire money without further Legislation.

On the 20th day of August, the Legislature appropriated five thousand dollars for a reconnaissance and preliminary survey of the line.

And, on the 28th day of August, by a Resolve of the Legislature, the Governor of Maine was authorised and requested to communicate to the President and Congress of the United States, from time to time, such information as he might deem it advisable to lay before them, as to the advantages of the route through Maine, proposed for the European and North American Railway, for securing the most direct and rapid communication between this country and Europe, and to invite such aid and co-operation on the part of the General Government as the interests of Maine might require.

The Governor immediately commissioned A. C. Morton, Esq., to take charge of the survey; who at once entered upon the discharge of the service, and placed two surveying parties in the field, Hon. Amos Pickard, of Hampden, acting as Commissioner. John Wilkinson, Esq., the Engineer in charge of the survey from St. John to the boundary of Maine, and Mr. Morton, had a meeting at the boundary, and the two surveys are made in concert, by the arrangements of the two Engineers. It is believed that before the close of the present year, the surveys can be so far advanced as to show, in connection with previous surveys, the most direct and practicable line from Bangor, in Maine, to Halifax or Whitehaven. Enough is already ascertained, to show that no serious engineering difficulties will be found on any part of the line, and that the distance will fall below the previous estimates.

By a simple act of each Province, of New Brunswick and Nova Scotia, constituting the European and North American Railway, as incorporated by the State of Maine, a corporation within said Provinces, with the right to exercise the several powers granted—in the same manner, and to the same extent, and under the same limitations and restrictions as are contained in the charter granted in Maine—that the most ample corporate powers are secured to said company forever.

The Legislatures of New Brunswick and Nova Scotia meet in January next.

Meanwhile a provisional subscription has been commenced in New Brunswick, and we are informed that in the city of St. John some £60,000 are already raised, and the assurances are that \$1,500,000 can be raised by private subscription in that Province alone.

In Nova Scotia, most unfortunately, there is a disposition to throw the work into the hands of the Provincial Government. We are glad to see so good a feeling manifested by Sir John Harvey, Lieut. Governor of Nova Scotia, and by the leading men of the government; but we think there should be no departure from the original plan.—Such we have reason to know are the opinions of the Executive Committee. The city of Halifax alone can raise one half the amount required to complete the line in that Province, and they should

ask nothing of the government but a law similar to the Canadian law, guaranteeing one-half the cost of certain great trunk roads. We think the Canadian law just what is wanted in New Brunswick and Nova Scotia; and nothing further.

In Maine 82 miles of the distance are already completed—as far as the Kennebec river at Waterville. A second line to the same point will in all probability be completed within two years, passing through Augusta, the capital of Maine. From the Kennebec river to Bangor, a distance of some 50 or 55 miles, the necessary stock is taken to organise the company, and a choice of directors for this line takes place at Bangor the 27th of the present month. It is hoped that the companies between Portland and the Kennebec river will readily furnish the means for completing the line to Bangor. From Bangor to Calais, the distance of 90 miles, is on a route of easy construction, and the people of Bangor and the eastern part of the State can furnish the means required for its early completion.

We shall look with great interest for the report of Mr. Morton, who proposes to issue, at the expense of the State of Maine, a plan and profile of the whole line from Bangor to Halifax. The line from St. John to Halifax having been previously surveyed at the expense of the Provinces of New Brunswick and Nova Scotia.

We presume that no effort will be made to obtain the subscriptions to stock in Maine till after the Legislatures of New Brunswick and Nova Scotia shall have granted the necessary charters in their respective Provinces.

Speech of Hon. Robert Rantoul, Jr., of Mass.

That he had come there for the purpose of informing himself of the practicability of a speedier intercourse with Europe by the route proposed, of the obstacles to be overcome, the cost of the enterprise, and the degree of interest felt along the line, of all which matters he was ignorant, but presumed that others were ready with full statements of these particulars essential to be known. As I am called on however to open the discussion, he said, I will not offer an evil example by declining to speak what is within my knowledge, and seems to be pertinent to this occasion, a few words upon the importance of the project under consideration. Massachusetts may well utter her voice on this occasion, for her sons live along the line you propose, a line to connect Liverpool, London and Paris, the British Islands and the Old World Continent, on the one hand, with Boston, New York, Cincinnati, and St. Louis, with the Atlantic slope, the basin of the lakes, the valley of the Mississippi, and the rising Pacific empire on the other; the highway between the accumulated numbers and wealth of all Christendom and Pagandom after their many thousand years of tardy growth, and the nation whose young energies have raised her from a third rate to a first rate power in the first half of the nineteenth century, and will make her the mightiest empire of the world, that is or has been, with her hundred millions of homogeneous population, before the close of this century.

To know what is proposed to be done, is to know at once the vast interests involved in its accomplishment—interests not confined to one age or to one continent, but broad as humanity, and lasting as time. You propose to cut off nearly one third from the interval which separates one division of our race from the other. Doing this, you will multiply and strengthen the ties of friendship, mutual benefit, and consequent peace in a greater proportion than you approximate men in their business relations. You will have made a greater practical advance than any one act of man ever yet made towards combining the inhabitants of the globe in one grand brotherhood.

What demand exists for a road from the United States through Nova Scotia, with a ferry to Ireland, and thence across the British Islands to Europe?—How shall we measure the use likely to be made

of it? Of its local travel, I will not speak, because I see those here who can estimate it from personal acquaintance with the country; but it is obvious that you will have all along the line when completed, that which has gathered in Massachusetts her million of inhabitants, abundant and convenient water power with facilities for cheap and rapid transportation; and you will have besides what Massachusetts has not, coal ready to your hand, inexhaustible, and associated with the richest mineral treasures.

The number of emigrants arriving in the United States will average about a thousand a day. It would require but a small part of these to give employment to the shortest line. With business passengers the time to be saved becomes an important element in the choice of routes. As business now increases, daily lines of steamers will soon be required, and it is hardly credible that the throngs they will bring will spend three days or even two days, on the way, which could so easily be economised.

Will our intercourse with the old world continue to increase? I doubt it not; and at an accelerating ratio. Every addition to our commerce and navigation causes a new movement of passengers to look after their interests in the various operations going on. Modern commerce is almost wholly the growth of the present century, and it belongs almost wholly to two nations, Great Britain and ourselves.

There is nothing so wonderful in the history of civilization as the late development of commerce: nothing so wonderful as the amazing increase of British navigation, except the still more amazing increase of our own. The British empire has her four millions of tons of shipping. We have our three and a half millions of tons, but about one million of tons of this amount has been added in the last four years—an increase equal to that of about nine times as long a period from 1810. New York has now more shipping than the whole British empire had during the war of the revolution. This State of Maine owns and builds more tonnage in proportion to her population than any other State or nation on the face of the globe.

There are some general considerations which satisfy me that this sudden and unexampled development of commercial industry is far from having reached its highest point. The new trade of the Pacific will employ more shipping than the United States owned when the Constitution was adopted. These ships must be built, and their many hundreds, not to say thousands of cargoes supplied mostly in New England and New York. The returns must come back here, and when our system is saturated and the channels of circulation filled with the precious metals, so that gold is worth less here than abroad, we shall become a gold exporting nation, and import what Europe has to sell in return for our gold as well as for our corn and our cotton. This alone will add many millions to the annual aggregate of our foreign commerce.

The demand abroad for our agricultural produce can be met more readily and more fully when the railways of the Western States can bring the crops of the interior down to water carriage on the lakes, and rivers, and where there is shipping enough to transport it. This demand already exceeds the most sanguine expectations. In the last four years we have exported three thousand millions of pounds of cotton, worth two hundred and fifty millions of dollars, half a million of hog-heads of tobacco, ten millions of barrels of flour, ten millions of bushels of wheat, forty millions of bushels of corn, half a million of tierces of rice, besides animal products in quantities unprecedented, all at prices higher than the average of the four previous years.

Commerce has changed its entire character within a short period. Formerly when transportation was slow and costly, it was only articles of high value that would bear the charge. In the account of the trade of the Roman empire with the East Indies in the time of Pliny, averaging the cost of all the articles named, of which prices can now be ascertained, I find they range generally from fifty cents to more than a dollar per pound for all that may be supposed to constitute the bulk of their cargoes, to say nothing of gold, gems, pearls and objects carried in very minute quantities.

It is quite obvious that a very small amount of tonnage would be sufficient for the commerce of the world while it was confined to these articles,—

They were sold at Rome, often at two or three hundred per cent. on the first cost. Yet the business of the merchant was very precarious. Of course, a few persons only consumed these luxuries. The mass of mankind had no interest in commerce; they consumed nothing that was not of domestic origin.

Take a single article that will illustrate the change. Sugar was once sold by the drachm for supposed medical uses. After sugar was used as it is now, two pounds of it at Venice would purchase a day's labor. Now we import more than a hundred thousand tons of that article at about three cents a pound, in addition to our home supply, because the cheapness of the article allows it to enter into universal consumption.

So great are the improvements in navigation, that articles as bulky in proportion to their value as corn, iron, salt, coal and ice, can be profitably carried on long voyages. Flour, sugar, coffee and cotton, of course can be transported at much less addition to their original cost. The great mass of the domestic exports of the United States will average, taking one year with another, not far from sixty dollars per ton weight; a fact which explains the creation of our vast mercantile marine, increasing without a parallel in the annals of the world.

Commerce is now an instrument of the comfort and well-being of the millions of men all over the world, instead of ministering to the caprices of a few. It must expand with its extended sphere of action.

This expensive tendency is promoted by the new policy of Great Britain, and some other nations, who have lately removed some of the principal obstacles they had placed in the way of their own commerce. Since Great Britain encouraged her own industry by allowing her laborers to make their purchases in the cheapest market, her intercourse with us has advanced with rapid strides. From 1845 to 1849, the aggregate of our imports from and exports to the British dominions had increased from one hundred and ten millions to one hundred and sixty millions of dollars, our imports increasing almost forty per cent., and our exports more than fifty per cent. in four years.* The increase in our Indian corn alone, to the British dominions, in the year 1849, which was not a year of famine, was more than three hundred thousand tons a weight greater than our whole exports of cotton a few years ago.

The corn growers of Illinois want railroads and must have them. They have little spare capital, and need cheap rails on good terms. They have corn, not wanted at home, but wanted at good prices by the makers of British iron. One ton of corn from Illinois laid down in Liverpool will buy a ton of rails, and give employment to American shipping out and home. Such an exchange is full of benefits to all parties. There is no danger that mankind having once enjoyed those benefits will voluntarily relinquish them. God has not created in vain different soils and climates, but by constantly improving facilities of intercourse, the people of each climate become participants in all the advantages of every other. I look forward then to a future for commerce far beyond the present brilliant reality, and of the intercourse growing out of that commerce, the shortest and quickest route between New England and Old England must be a main artery.

LINE OF PROPELLERS BETWEEN SAVANNAH AND NEW YORK.

A project is on foot in Savannah to organize a company to build a propeller of 1100 tons, with sufficient capacity for 1500 to 2000 bales freight, and cabin accommodations for 100 passengers, and good proportion for stowage. The cost of this vessel will be about \$100,000, which will be taken in shares of \$100.

	1845.	1849.
* Imports from British dominions.....	49,903,725	67,387,983
Exports to British dominions.....	61,044,535	93,173,339
	\$110,948,260	160,560,333

Internal Improvements of the State of New York.

A SKETCH OF THE RISE, PROGRESS, AND PRESENT CONDITION OF INTERNAL IMPROVEMENTS IN THE STATE OF NEW YORK.

Continued from page 723.

Mr. Clinton noticed this important feature in the route through New York in his memorial to the Legislature in 1816, as follows:—"Some of the waters of this state which pass into Lake Ontario approach the Mohawk; but our Hudson has decided advantages. It affords a tide navigation for vessels of eighty tons to Albany and Troy, 164 miles above New York; and this preliminary distinguishes it from all the other bays and rivers in the United States, viz:—The tide in no other ascends higher than the Granite Ridge, or within thirty miles of the Blue Ridge, or eastern chain of mountains. In the Hudson it breaks through the Blue Ridge and ascends above the eastern termination of the Catskill, or great western chain; and there are no interposing mountains to prevent a communication between it and the great western lakes."

Passing southwest for a distance of 25 or 30 miles from the Erie Canal at Utica, the rise is over 700 feet to the summit of the Chenango Canal; and passing northeast from the Erie Canal at Rome for a distance of 25 miles, the rise is 693 feet, requiring 70 locks to reach the Boonville summit of the Black River Canal. The canal of only eight miles in length, from the Seneca to the Crooked Lake, has 27 locks; and the Genesee Valley canal rises so rapidly from Mount Morris as to require 47 locks in a distance of about four miles, and this elevation reaches 700 or 800 feet in a distance of 25 or 30 miles.

The Erie Canal, through portions of the counties of Oneida, Madison, Onondaga, Cayuga, Wayne, &c., was located along the low lands between the elevated ground north and south of the line, as indicated by the surveys of the Chenango and Black River canals; and through the marshes created by the outlets of the Cayuga, Seneca, Canandaigua, and other lakes. The original surveys of the line from Rome west for a hundred miles, was to a great extent through low lands from which the timber had not been removed, and large tracts of which were not susceptible of being converted to agricultural purposes, without an expenditure in drainage too great to be encountered by individuals at that time.* But the formation of the country was peculiarly favorable for a canal. The commissioners, in their report of 1819, after alluding to the necessity of reservoirs and the difficulty of obtaining and controlling waters for canals in Europe, say: "In making our canal, we are much more anxious to divert and waste those waters which are superfluous. With a country of from fifteen to sixty miles wide, stretching its whole length, and abounding with lakes and streams, which all seek their natural discharge by crossing it, no deficiency of water can ever be apprehended."

From the head of tide navigation in the Hudson river to Lake Erie, 363 miles, the rise and fall is given by the Canal Commissioners, in their annual report of 1817, at 661 35 100 feet, requiring 77 locks on the direct line. The original profile of the Erie Canal, published in 1825, shows 83 locks, counting one of the tiers at Lockport, and a rise and fall equal to 687 feet. In enlarging the canal, seven locks were dispensed with between Albany and Utica—two by cutting down the Jordan level—and three by an aqueduct across the Seneca river and Montezuma marshes.† The number between Albany and Utica is diminished by adding to the list of some of the locks. The five locks dispensed with at the west, it is supposed, diminish the lockage 47 feet, leaving the rise and fall for the whole distance from Lake Erie to the Hudson at 640 feet, and the number of locks, omitting the dou-

* The commissioners in 1817, describing the middle section of 77 miles, say:—"As a great part of the route of this section lies through low lands, where the timber is very heavy, with large roots, the estimate for grubbing and clearing it is at the rate of \$1,500 a mile." This is the line from Rome, through the present city of Syracuse, to Montezuma.

† See Annual Reports of Commissioners, 1836, 1839, and 1850.

ble locks, at 71, equal to an average of a fraction less than one lock for each five miles of canal. On the Chenango Canal there are nineteen locks more than one to a mile—on the Black river a little more than two to a mile—on the Crooked Lake a little more than three to a mile—the Chemung Canal has 53 locks on 39 miles of canal—the Glenn's Falls feeder about one lock to a mile. The rise and fall on the Chesapeake and Ohio Canal would require 321 locks of 10 feet lift on a line of 341 miles, a little less on the average than one to a mile. The Pennsylvania Canal route requires 451 locks of 10 feet lift each, being 10 locks more than one to a mile. Even the Ohio Canal, from Cleveland to the Ohio river, averages more than one lock to each two miles of canal.

The Erie Canal, as originally constructed, had one level of 69 miles, another of 64, and a third of 30, and others of 8, 10, and 12 miles. The long level from Frankfort to Syracuse, has been altered in enlarging the canal, by placing a lock of three feet lift at Utica.

The route for the transportation of products from Lake Erie to New York, possesses natural advantages which are not found on any other route between the western waters and the Atlantic, in the extensive mountain range from the Highlands on the Hudson to Alabama. By a timely and judicious improvement of these great natural advantages, the state of New York has been enabled to counteract the disadvantages of a rigorous climate, which closes the canal five months in the year, and to compete successfully with shorter routes, passing through milder climates.

The state of Pennsylvania has constructed a work across the Alleghany Mountains, which evinces the highest degree of enterprise and perseverance. The spirit with which this great work was undertaken and executed, deserves success, if it does not command it. A railroad crosses the range of mountains by a tunnel 900 feet in length, and an ascent and descent of 2,570 feet in a distance of 36 miles; and this formidable obstacle is overcome by ten inclined planes, operated by as many stationary engines. In the whole distance from Philadelphia to Pittsburg, by way of the Columbia railroad and canal, 394 miles, the ascent and descent is 5,220 feet; and by the Schuylkill, Union, and Pennsylvania Canals, 441 miles, the ascent and descent is 4,514 feet; 1,944 by locks and 2,570 by inclined planes.* The disadvantages in crossing the mountains by stationary power, and other embarrassments in the mode of transit, have led to the determination to complete a continuous railroad from Philadelphia to Pittsburg, which shall dispense with the inclined planes. But the tonnage must ascend and descend the Alleghenies, by the most formidable grades which can be surmounted by a locomotive engine.

On the Virginia route, as stated by Mr. Ellet, the engineer who surveyed it, a line has been found where the mountains can be crossed at 500 feet less elevation than in Pennsylvania. He also states that the Chesapeake and Ohio Canal, to surmount the same impediment, requires nearly 3,250 feet of lockage;† and a tunnel more than four miles in length. "While on the Baltimore and Ohio railroad the system of abrupt grades is resorted to, and the line is sustained on the sides of the mountains at great expense and difficulty."

In the early discussions in regard to the character of the several routes for the accommodation of the trade of the west, Cleveland, or the mouth of Cuyaboga, on Lake Erie, was selected as the point. Since the opening of the great Ohio Central Canal from which the distance to market is computed, the point of comparison has been removed to Portsmouth on the Ohio river, which is more than 1,000 miles from the city of New York, exceeding the other routes to market by 278, 300, 400, and 500 miles. In view of all the advantages of the Virginia route, which connects with the Ohio 276 miles below Pittsburg, having better navigation on the Ohio than Pennsylvania and Maryland, and 500 miles less to market than New York, Mr. El-

* Report of Mr. Stewart to the Chesapeake and Ohio Canal Convention in 1834.

† Mr. Stewart gives the lockage from tide water at Washington to Pittsburg, 341 miles, at 3,216 feet.

let says:—"I do not regard the rivalry of New York; for the least investigation of the facts will show that New York can reach the trade of the Ohio only through the Pennsylvania and Virginia lines." He adds, however, in a note, that, "the superiority of the New York market will cause the trade of the states of Ohio, Indiana, and Illinois, to divide near the watershed of that territory, leaving to New York about one-third of the territory of Ohio and Indiana, and the north part of Illinois." It might be claimed on the part of New York, that the comparison between the routes should be made from a point equidistant from the Ohio river and Lake Erie. But as a new channel is now in operation from Lake Erie to Cincinnati, it is proposed to compare the routes from the latter place.

The Virginia route, from the mildness of the climate, the shortness of the distance, and its favorable connection with the Ohio river, possesses peculiar advantages for the accommodation of the trade of the valley of the Ohio. And Virginia, Maryland, and Pennsylvania, each have, in the article of coal, the means of supplying an inexhaustible quantity of tonnage; a resource denied to New York, except so far as it can be drawn from other states. It is estimated by Mr. Ellet, that the improvement which traverses the state of Pennsylvania, is now inoperative, by drought or ice, at least five months of the year. The navigation of the Erie Canal for the last ten years, has averaged 22½ days, being 64 days more than seven months of navigation in each year. For about five months in a year then, both the Pennsylvania and New York routes are not in good order for the transportation of products. The other causes which materially affect the choice of route for the transportation of commodities are—distance from market; the rise and fall on the route to be overcome by locks or inclined planes; the character of the work in affording security in the mode of transit; certainty in reaching the market at a fixed period; and the character of the market.

In the following table the distance is computed from Cincinnati, on the Ohio river, to the Atlantic city where the products are sent to market. The table shows:

1. The number of miles from Cincinnati to the shipping port.
2. The distance from the shipping port to the ocean.
3. The distance from Cincinnati to the ocean by the route designated.
4. The rise and fall in feet, to be overcome by locks or inclined plane, from Cincinnati to tide water, on each route.

From Cincinnati.	Dist. to shipping port. miles.	From shipping port to ocean. miles.	From Cincinnati to ocean. miles.	Locks or rise and fall. feet.
To Richmond, by the Ohio, Kanawha and James rivers.	688	135	823	3,300
To Georgetown, by Ohio river and Chesapeake and Ohio Canal.....	808	177	985	3,215
To Baltimore, by the Ohio river to Wheeling, & railroad.....	741	200	941	3,215
To Philadelphia, by Ohio river, canals and Columbia railroad.....	862	105	967	5,230
To Philadelphia, by Ohio river and canals.....	941	105	1,046	4,514
To New York, by Miami Canal to Lake, and Erie Canal.....	1,010	20	1,030	*1,239
To New Orleans, by Ohio and Mississippi rivers.....	1,511	100	1,611	

* This includes 599 feet of lockage on the canal from Manhattan, Lake Erie, to Cincinnati, a distance of 250 miles, viz., 70 Wabash and Erie to

There is a route from Cleveland to Philadelphia, by way of Akron, on the Ohio Canal, and Beaver-ton, to Pittsburg, and the Pennsylvania Canals.—But this route will add 900 feet to the lockage, and 93 locks to the canal route, making the total rise and fall from Cleveland to Philadelphia, 5,414 feet, requiring 541 locks of ten feet lift each, in a distance of 610 miles. It is 704 miles from Cleveland to New York, with 640 feet of lockage and 71 locks.

The route down the St. Lawrence is not brought into comparison with the other routes in the preceding table, for the reason that, so far as New York is concerned, the battle for the western trade with her Canadian neighbor must be decided on the lakes.—*Merchants' Magazine.*

To be continued.

Routes Across the Isthmus.

Continued from page 721.

Lake Managua may thus be said virtually to have no outlet. The streams which come in from the Pacific side, are insignificant; and though, as already stated, the Rio Grand and other streams of considerable size flow into it from the direction of Segovia, yet they vary much with the season of the year, and seldom furnish a greater quantity of water than is requisite to supply the evaporation from so large a surface in a tropical climate. The lake sometimes rises a few feet from the influx of water, but according to the concurrent testimony of the inhabitants on its shores, its average level is considerably less than it was some fifteen or twenty years ago, before the terrible eruption of Consegua. Nevertheless, a reservoir like that of Managua, with 1,900 square miles of surface, would be adequate to supply all the water required for a ship canal at this point, without any sensible diminution of its volume. The winds on the lake blow freshly from the NE. during the afternoon and evening, and subside towards morning, causing an ebb and flow in its results corresponding with that produced by the tides of the ocean; hence the vulgar error of a subterranean communication with the sea. The same is true of Lake Nicaragua.

LAKE NICARAGUA.

Lake Nicaragua is unquestionably, in all respects, one of the finest bodies of water on the continent, and needs only to be made easy of access to become as famous a resort of the grand and beautiful in nature as any now known in the Old or New World. In common with Lake Managua, its size has been rather under than over-estimated. Mr. Bailey calculated its greatest width at 40 or 45 miles. It is probably nearer 120 miles in length by 60 or 60 in breadth. Upon its southern shore, near the head of the lake, is the ancient city of Grenada, the most important commercial point in the republic. It has a considerable trade, which is carried on through the port of San Juan on the Atlantic by means of small boats of peculiar construction, and capable of carrying from four to ten tons, called *bungos*. These make the trip to San Juan and back in about three weeks time. Upon the same shore with Grenada, but 40 miles distant, is the city of Nicaragua or Rivas, the capital of a very large, fertile, and comparatively well-cultivated district. The water of the lake, in most places, shoals gradually, but at some points vessels of the largest class may approach close to the shore.—The depth, except in the immediate vicinity of its outlet, is for all purposes of navigation ample, ranging from 8 to 20, and even 47 fathoms. The prevailing winds are from the NE. (the direction of the summer trades on the coast), and when the breeze is considerable the waves of the lake roll with all the regularity and with much of the majesty of those of the sea. At such times, the surf upon the shore at Grenada is nearly as high as that upon the beach at Newport and Cape May.

RIVER SAN JUAN.

The river of San Juan, concerning which so much has been written, is certainly an exceedingly magnificent stream, but its capabilities have been greatly exaggerated. It is the only outlet as is well known, of the two large lakes just described. It flows from the southeastern extremity of Lake Nicaragua, nearly due east, to the Atlantic. Its length has been variously estimated from 79 to 104

Junction, 114 Miami Extension, and 66 Miami Canal, from Dayton to the Ohio river.

miles. The first estimate is obviously too little.—Mr. Bailey calculated it at 90 miles, and he is probably not far from correct.

The body of water which flows through this stream is at all times considerable, but it varies greatly in amount at different seasons of the year. It is greatest during what is termed the "rainy season" in the interior, that is to say, from May to October, at which period the volume of water is nearly doubled. To this circumstance in a great degree may be ascribed the whole difference in the statements of the depths and capacity of the river made by different individuals.

Several considerable streams enter the San Juan, the principle of which are the San Carlos and the Serapique, both rising towards the south in the highlands of Costa Rica. The streams flowing in from the north are comparatively small, indicating that the mountains are not far distant in this direction, and that upon this side the valley is comparatively narrow. The Serapique is ascended by boats to a point where the Costa Rica road (trail) commences. This is the route by which Costa Rica keeps up communication with the San Juan, and to the point here named she is now endeavoring to construct a road for mules starting from San Jose, her capital. The banks of the San Juan, from the fort of San Carlos, at the outlet of the lake, to the *Rapides del Toro*, a distance of twenty miles, are generally low, and covered with palms, canes, and a species of high, coarse grass called *gamalote*. The river here sometimes overflows its shores, which for a considerable distance back seem to be flat and swampy. From the port of San Juan upwards to the point of the divergence of the Colorado, a distance of eighteen miles, the banks of the river present a corresponding appearance. In fact, the entire country from this point to the sea is flat, as is shown by the divergence of the Colorado, the Juanillo, and Tauro, and by the occurrence of numerous lagunas. It is nevertheless fertile, and capable of producing in the utmost luxuriance rice, sugar, and those other articles which require moist and fertile soils. From the Colorado to the *Rapides del Toro*, a distance of more than fifty miles, the banks of the river vary from six to twenty feet in height and are densely wooded, the forests coming down to the water's edge, forming an almost impenetrable wall of verdure. The passenger in the boats is so completely shut in by vegetation, that it is impossible to discover what is the character of the back country. At intervals hills and high grounds are to be discerned, and sometimes these came down to the edge of the river. At the mouth of the San Carlos there are hills 2,000 feet high, and the river is much contracted. The entrance of the passage between them, from the west, somewhat resembles the opening of the highlands of the Hudson from the north.

The banks of the river are in some places rocky; elsewhere they are far from being as crumbling as those of the Ohio and Mississippi and other rivers of the Western States of the Union. This is, perhaps, due, in some respects, to the roots of trees and plants which penetrate and bind the earth in all directions. The bed of the river may be regarded as essentially permanent; it nevertheless abounds in islands, of which there are hundreds. Some of these are low and covered with *gamalote*, or with canes; but most are as high as the banks of the river, and wooded in like manner.

The width of the river varies from one hundred to four hundred yards, and its depth from two to twenty feet. I should estimate the average volume of water at about that of the Hudson below its confluence with the Mohawk. The bottom seems generally to be gravel. There are four considerable rapids, where the bed is rocky and the water shallow; these will be noticed hereafter in detail. The current from the mouth of the river to the Del Toro is very rapid. With the water at a medium stage, in a light bongo, and with a stout crew of 10 men, I was six days in passing from San Juan to San Carlos. The men labored hard at the oars and setting poles from long before daylight until after dark each day. We passed other bungos which had left three days before us, and our trip was regarded as one of extraordinary rapidity. From these facts, some idea may be formed of the

strength of the current. Bulow calculates the fall of the stream at twenty inches per mile, except at the various rapids, where it is more.

The banks of the river are totally uninhabited, nor is it known that any one has penetrated the country in either direction. A small garrison is stationed at Castillo Viego, about twenty-five miles below the lake, and the rapids Del Casillo. There is no doubt that the entire region is eminently fertile, and capable of producing all the fruits and staples in the greatest abundance.

Virginia.

Virginia and Tennessee Railroad.—We find in the Richmond papers, the speech of Mr. Garnett, Chief Engineer of the above road, delivered at a meeting held in that city on the 19th ult., to take the necessary steps to raise \$100,000, the sum which it is now called upon to contribute to the above work, for the purpose of putting an additional division of 70 miles under contract the present season. The first division of the road from Lynchburg to Salem, a distance of 60 miles, by far the most difficult portion of the whole route, is now far advanced in the work of grading, and the iron for this portion of the line has been purchased.

The greater part of the speech of Mr. Garnett is taken up in illustrating of the advantages of railroads, from the favorable influences they have exerted wherever built, and in showing the importance of the above work to Virginia and the region traversed by it, which is unquestionably one of the best in the country. It is exactly to the point, dealing in plain matters of fact, discarding anything like display or verbiage. It should be placed in the hands of every man in the State, as a sort of a vade mecum of railroad information.

We have not room for the principal part of his remarks, which is designed to have a local bearing, and to operate upon those immediately interested in the road. But as this work, from its connections, becomes national in its character, so far it interests a New Yorker equally with a Virginian; and we copy the following for the purpose of showing what this road will enable us to accomplish in the way of travelling, when the whole line, of which this is a part, shall be completed.

Now what is the prospect of having all this line completed? You already know the chance of finishing the Virginia and Tennessee railroad, which extends from Lynchburg to the State line, 210 miles. The East Tennessee and Virginia road thence to Knoxville, 110 miles long, is now under construction. Seven hundred thousand dollars have been subscribed by private individuals, and a considerable distance has been put under contract. There is every reason to believe that the State will subscribe to this work if it is desired. Next comes the Georgia and East Tennessee road, which now runs to Dalton in Georgia, a distance of 115 miles, leaving 40 miles to reach Chattanooga, by the State road of Georgia. This distance will hereafter be saved by leaving the Georgia and East Tennessee road at Cleveland and running direct to Chattanooga, which is the same distance from Knoxville that Dalton is.

This road is in a rapid course of construction—even the iron, locomotives and cars have been purchased. In this road the State of Tennessee holds a large interest. From Chattanooga, we will use 40 miles of the Nashville and Chattanooga railroad, which is under contract. Then comes the Memphis and Charleston railroad, 280 miles long. For this road \$1,500,000 have already been subscribed by individuals, and the aid of the State can be obtained if necessary. But the citizens of that country have already displayed a degree of enterprise and public spirit which gives assurance of success. Some idea may be formed of the favorable direction of this route, from the fact that, in the 320 miles from Chattanooga to Memphis, there is not a variation in latitude of more than 30 miles. The whole variation between Richmond and the far-

thest southern extremity of this line of roads will be only 2½ degrees of latitude. By a glance at the map, the remarkably favorable direction of the whole route from Memphis by way of our road to Boston, cannot fail to strike any one who will take the trouble to examine it.

Virginia.

Winchester and Patomac Railroad.—By the last annual report of this company it appears that the earnings of this road for the year ending Oct. 1st, 1850, is \$96,862 60, being \$5,427 27 more than last year. Of the whole sum received, \$23,861 37 was for passengers, the whole number carried over the road for the year being 15,038, and the amt. of tonnage transported over the road is as follows:

Tonnage Eastward.	
Flour, 211,858 bbls.....	tons..21,185
Merchandise and produce.....	2,239
Iron, pig and bloom.....	1,523
Manganese.....	158
Tonnage Westward.	
Merchandise.....	9,824
Plaster.....	3,099
Coal.....	1,370
Aggregate.....	38,398

Statement of the Financial Condition of the Company on the 30th Sept., 1850.

Capital stock.....	\$180,000 00
Funded debt, due in 1867.....	120,000 00
Annuity to the state, \$5,000 principal.....	83,333 33
Floating debt.....	26,082 57
	\$409,415 80

A semi annual dividend of six per cent was paid on the first of May last, and the board declared a dividend of six per cent, payable the first November inst. The above is 32 miles long.

Indiana.

It is a subject of general remark, that there is no State in the Union where railroad enterprise is more widely spread than in Indiana. Whether we look east, west, north or south, we see our enterprising citizens engaged in constructing railroads; while here at the capital, all the roads seem to centre in noisy uproar upon our Union track, by which they are connected together as extensions of each other. We give, for future reference, as well as to show how true the above remark is, a brief statement of our railroads, completed and in progress of construction, from the best sources we have at command, and which we presume is nearly correct.

	Length.	Completed.	Constructing.
Madison and Indianapolis.....	88	88	—
Shelbyville and Edinburgh.....	16	16	—
Knightstown.....	26	26	—
Rushville and Shelbyville.....	19	19	—
Indianapolis and Bellefontaine.....	83	28	55
New Albany and Salem.....	100	27	73
Jeffersonville.....	66	8	58
Lafayette and Indianapolis.....	61	—	61
Peru and Indianapolis.....	70	—	70
Crawfordsville and Lafayette.....	26	—	26
Eva'sville and Illinois.....	50	—	50
Lawrenceburg and Indianapolis.....	87	—	87
Junction.....	38	—	38
Terre Haute and Richmond.....	141	—	141
Richmond and Newcastle.....	50	—	50
Martinsville and Franklin.....	20	—	20
Southern Michigan.....	100	—	100
Richmond and Ohio.....	4	—	4
Cincinnati and St. Louis.....	160	—	160
	1205	212	993

—Indiana Statesman.

Vermont.

Central Railroad.—Earnings for October, after deducting amount paid the lower roads, \$35,256 46—an increase of \$4,969 57 over the month of September.

Maine.

Penobscot and Kennebec Railroad.—We take the following from the Bangor Whig of the 13th inst. Our article in this week's paper in reference to the European and North American railway, or which is commonly known as the Portland and Halifax road, will show the relation which the proposed road from Bangor to the Kennebec river will bear to the leading lines in Maine.

Such are the topographical peculiarities of Maine that the line from Bangor to Waterville must always command the entire through travel of the State:

We are requested to state that the parties who have in charge the management of the affairs of the Penobscot and Kennebec railroad, propose to make a definite location of the line during the present year, as required by the charter. Surveys were made in 1847 and 1848 for a route through the Sebasticook valley, and more recently a line has been surveyed through Dixmont and Unity; and another line through St. Albans, Dexter, &c.

We are informed that by either route a good line could be formed, and the difference in distance between the two first named is but a few miles only.

In order to act understandingly in the matter, may become necessary to survey both lines anew, and possibly examine a still farther route through Plymouth and Etna.

For the purpose of giving a fair hearing to all parties interested, those residing on the line, at each terminus, and on the competing lines from Portland to the Kennebec valley; it is proposed to take up conditional subscriptions to the stock on each line—at Bangor, Waterville, Augusta, &c., and books of subscription will be prepared for this purpose.

Those who desire the line located in the Sebasticook valley, will subscribe upon the condition of its being so located—those desiring the southern route, through Dixmont, &c., will subscribe on the condition of its location on the general line surveyed through Dixmont, Unity, &c., and the same of the next southern route through St. Albans and Dexter.

It is proposed also to take offers of the right of way, on the different lines, so that in a proper quotation of all the points of difficulties or of advantage, the best conclusion can be reached.

Should the two short lines be found on close examination to be nearly on a par, when all the engineering points are fairly equated, the amount of comparative subscription to stock or in the cession of lands would necessarily have an important influence upon the decision of the question of the route. We would therefore advise the friends of each route to bestir themselves betimes.

Again the question of connection at the Kennebec river, becomes important to the two roads, and from thence to Portland. This necessarily involves the question of gauge. This question may have to be settled in the same way as the question of route. The friends of the narrow gauge to Augusta must bid sharp or they may be surpassed in their exertions by the friends of the broad gauge from Waterville to Portland. We understand conditional subscriptions will be taken up at Bangor, as well as along the two lines to Portland, with a view to test the strength of these two interests, and the feelings at Bangor upon the question of 'gauge,' 'through route,' &c.

Cotton Factories at the South.

It is estimated that there are now in operation in Georgia, 40 cotton factories, which employ nearly 60,000 spindles, and consume 40,000 bales of cotton annually. In Tennessee there are 30 cotton mills; in South Carolina 16, and in Alabama 12, making 96 factories in these four states. The mills in South Carolina contain 36,000 spindles, and consume 15,000 bales of cotton yearly. In Alabama there are 12,500 spindles in operation, requiring 5,500 bales of cotton yearly for consumption.

As an offset to the above interesting particulars we note the following:—

The Providence Journal contains a list of twenty cotton mills within 40 miles of that city, which

have been compelled to stop. A large manufacturing establishment at Willimantic, Conn., has failed.

Tennessee

Railroad to Cleveland.—The last Legislature granted a charter for a railroad from Chattanooga to Cleveland, to pass by, or near to Harrison; and the following named gentlemen were appointed commissioners, viz:

James A. Whiteside, Robert M. Hooke, John Cowart, Thomas McCallie, Reese B. Brabson, Benjamin R. Montgomery, Thomas Crutchfield, David N. Bell, A. G. W. Puckett, Richard Henderson, Wm. Clift, George Luttrell, Daniel C. Kenner, P. J. R. Edwards, Samuel L. McCole, and S. J. Gorie.

There was to have been a meeting of the commissioners in Chattanooga on Monday, the 18th inst., for the purpose of taking initiatory steps towards carrying the object of the charter into effect; at which time a full attendance of the commissioners is expected.—*Chattanooga Gazette*.

A NEW APPLICATION OF STEAM TO THE ENGINE.

We were very much interested, a few days ago, in witnessing the practical operation of a steam engine, invented by Mr. Clark, foreman for Messrs. Kingsland and Lightner, and which is to be seen at the foundry and machine shop of Messrs. Lightner and Ferguson, on Second street, between Green and Morgan. The principal novelty about it is, the application of the steam to the cylinder. In this, all the usual machinery of cams, valves, slides, &c., are dispensed with. Its intrinsic value consists in its entire simplicity, and the improbability of its ever getting out of order. The cylinder lies horizontal, vibrating on the centre. At each end of the cylinder there is a jug, or flat, smooth surface, with one aperture, working against a corresponding jug or flat surface, having two apertures. When the steam is let on, it passes through one of these apertures in the centre jug into the cylinder and sets it in motion; and as the cylinder vibrates up and down, it lets off the other without the aid of steam cheat, or any of the usual and multiplied machinery. It is difficult, without drawings, to describe it to the reader's understanding, but we must say that it is the simplest form of a steam engine, and has less machinery about it than any invention we have yet seen. Another improvement is in the piston rod, which is coupled directly on the crank, passes entirely through the cylinder, and having bearings at each end, prevents the cylinder head from cutting or wearing. It requires less steam, and any one can keep it in order. The present one, which is a small one, of only thirteen inches stroke, performs the same service that is performed by another in the same shop of five feet stroke. From the absence of all complication of machinery, it can be furnished at a very low cost, compared with those in use, and is eminently adapted to various purposes. The best recommendation we can give, is to invite an examination of it. The parties interested have taken the necessary steps to secure a patent.—*St. Louis Republican*.

Alabama.

Alabama and Tennessee River Railroad.—We have the gratification to announce that contracts have been made on favorable terms for the graduation, masonry and bridging of our road to Montevallo. The principal contractor is Col. Waller D. Riddle, of Talladega, the able and efficient contractor on the Mobile and Ohio railroad, a gentleman whose eminent qualifications in his business, and energetic character, give every assurance that the work will be speedily and well executed.

We congratulate the friends of our great enterprise upon the certainty of its completion, and the energy with which it has been carried into execution. Much credit is due to the president and directors of the company for the unexampled pro-

gress of the road. But one year has elapsed since the books were first opened for subscription—their all was doubt and hesitation—now with the stock and the appropriations of the legislature the means of the company exceed \$1,200,000. All the surveys, making an aggregate of a thousand miles, and all the estimates, etc., necessary to determine the location of the road, have been made, and about 56 miles of the road are under contract. We challenge a comparison with any enterprise in the country. We are assured that the next 4th of July we will have the pleasure of celebrating the advent of the iron horse in the Mulberry valley.

Arrangements are making to place under contract from fifty to sixty miles of the road in Talladega, Benton and Cherokee counties early this winter.—*Selma Reporter*.

Railroad Cars Without Dust.

The following is a description of an invention for the purpose of shutting out dust from railroad cars. The inventor is Mr. Nelson, for Goodyear of this city:

On the roof of the car a number of ventilators are arranged, so as to allow the air to pass freely into the car when it is in motion. The mouths of these ventilators are covered with a fine wire cloth through which the air circulates freely, but which effectually stops all cinders and other dirt. In each window of the car is placed a sash of blinds, constructed of plates of brass four inches wide. These blinds are so arranged that they are all moved by a connecting rod, in the same manner as ordinary window sashes are opened or shut. The air, coming through the ventilators, passes with a gentle current out of the blinds, or "car dusters," as they are called, the outward current thus formed effectually preventing the entrance of a particle of dust into the car, and the outside current, formed by the motion of the car, carrying the dust to the rear.

The Steamship Monumental City.

This splendid steamship, the launching of which from the yard of Mr. J. A. Robb, we noticed some two months since, has now all her machinery in, and in a short time will be prepared to start for her destination in the Pacific. She made what is called the "engineer's trip," for the purpose of testing her machinery, on Thursday evening, running down below Soller's Point Flats and back. Her engines, we learn, worked most satisfactorily and beautifully, without the least jar, and driving her through the water at about the rate of twelve miles in hour. She started on her regular trial trip yesterday afternoon, with a number of gentlemen on board who were invited by the owners to witness her performance. The intention is to go as far as Cape Henry and perhaps run out to sea for a short distance, in order to thoroughly test her machinery and ascertain her qualities. We expect on her return to be able to give a good account of her in both these respects.

The "Monumental City" is certainly a most beautiful vessel, her sharp clipper model and graceful appearance, challenging the admiration of all who have seen her since she has been fitted up.—She is a propeller steamship, her burden being about 750 tons. She has two engines of 200 horse power, built by Messrs. Murray & Hazlehurst, the propeller being one of Smith's screw propellers, an English Patent. The "Monumental City" is owned by Captain Norris, who is to have command of her, and other gentlemen of this city. The intention is to run her between ports on the Pacific, probably Panama and San Francisco; and she will sail from here for the latter port with passengers and freight. She has a first and second cabin, affording accommodations for about 250 passengers.

Her passenger accommodations are of the most superior character; the state rooms being fitted up with much elegance and abounding in conveniences. She has a flush promenade deck extending the whole length of the vessel, affording the passengers ample room for exercise during pleasant weather, an advantage which will be appreciated by all, and with her many other good qualities make her a favorite among the steam vessels on the Pacific.—*Balt. Am.*

Montour Iron Works.

For several months past, the large anthracite furnaces of the Montour Company have been undergoing thorough repairs, under the supervision of the Messrs. Grove, and will now soon be ready for another long, and we hope a prosperous blast of two or three years, without serious interruption.—In addition to the repairs making to the furnaces, the Montour Company have lately made another large addition to their mammoth rolling mill. For some time past the rail mill has been moving on in the manufacture of railroad iron very steadily and successfully.—*Danville Intel.*

RAILROAD DEPOT AT POTTSVILLE.

The *Miners' Journal* states that notwithstanding the repeated obstacles thrown in the company's way in the erection of a new depot, they have commenced operations, and the work is now rapidly progressing. The building will front on Centre street, immediately beside the American House, extending back to the railroad. The location is a desirable one, and when ready for use, will obviate the inconvenience so justly complained of by the travelling community in the delivery of themselves and their baggage at the Pottsville end of the line.

Testimonial of Respect.

Mr. John Russell, Jr., who has for many years been Superintendent of the Portsmouth, Saco, and Portland railroad, having resigned his office to accept a similar position in the Kennebec and Portland railroad company, those formerly associated with him, have presented to him an elegantly chased silver pitcher and goblet with the following inscription—

"Presented to
JOHN RUSSELL, JR.,
as a token of respect and esteem,
by those
associated in his employ
during his connection with the
Portsmouth, Saco, and Portland Railroad,
November, 1850."

FINAL OPENING OF THE BRITANNIA BRIDGE.

The permanent public opening of the new line of tubes for the down line from London to Dublin took place on Monday morning: the great structure being now in all respects made complete. On Saturday, Capt. Simmons, the government inspector, went over it early in the morning, and instituted, in conjunction with the engineers, a long series of experiments. The first and principal experiment consisted in passing the locomotive engines through the tube, and resting them at intervals in the centre of the sections. About nine o'clock a train of twenty-eight wagons and two locomotives with two hundred and eighty tons of coals was drawn into all four of the tubes, the deflections being carefully noted. These deflections in every case, by means of a nice apparatus for the purpose, were ascertained to be exactly three-fourths of an inch under this load, over the immense mass and area of iron.

After an interesting rehearsal of these experimental ordeals, which occupied several hours, the train of two hundred and eighty tons, with its two locomotives, was taken out about a mile distant from the tube, and then suddenly shot through it with the greatest attainable rapidity, and the result was very interesting as determining a much discussed question, it being found that the deflection at this immense velocity of load was sensibly less in the way of undulation or collapse than when the load

was allowed to remain at rest in the tube. The manner in which these results were registered and arrived at was by means of a new and curious contrivance, it being found that the tremor occasioned by trains, in transit prevented these deflections from being accurately read by the ordinary spirit level. —*London paper. Oct. 25.*

Utica Iron Manufacturing Co.

This company are now actively engaged in the manufacture of iron on a large scale. The Utica Gazette says "that over 1,500 tons are manufactured yearly, whose quality meets the approbation and secures the patronage of machinists and others in that line, throughout the country. Preparations are now making to enlarge still further the facilities for doing business. The works are under the superintendence of Mr. A. G. Smith, whose capacities and business qualifications are evidenced by the completeness and adaptation of every part of the complicated apparatus, which was erected under his supervision, and by the regularity and economy, which mark the progress of the manufacture."

The directors of the company are Alfred Churchill, Julius A. Spencer, Henry R. Hart, Elijah P. Williams, William G. Bullions, T. S. Faxon, David A. Lyons, A. G. Smith and Andrew S. Pond.

The officers are Andrew S. Pond, President; A. G. Smith, Secretary; and Henry R. Hart, Treasurer.

We are glad to learn that this company are doing a prosperous business, notwithstanding the general depression which prevails in the iron manufacture.

Interesting Discovery.

The model of the first steamboat (built by John Fitch) was discovered, a few days ago, in the garret of the late residence of the late Col. Kilbourne a brother-in-law of John Fitch, near the town of Columbus, in Ohio. It has been in the possession of Col. K. for more than thirty years. It is thus described in a letter to the Cincinnati commercial:

"It is about two feet long, and set upon wheels. The boiler is about a foot long, and eight inches in diameter, with a flue through it, not quite in the centre, into which the fire appears to have been placed. The cylinder stands perpendicular, and the framework that supports it is not unlike that now used by some of the low pressure boats on Lake Erie. There is a paddle wheel on each side, and, in fact, everything appears to be complete with the exception of a condenser and force pump. The boiler is even supplied with a safety valve, though part of it has been broken off."

Ohio.

The Columbus, Piqua and Indiana Railroad, a Link in the Great Central Chain of Railway from the Ohio River to St. Louis.—Artificial systems of facilitating intercourse between the most remote districts of country, have reached their climax in the railroad improvement. The experiment of this agency for purposes of communication for the last twenty-five years, has resulted in its adoption as the grand mode of transportation, excelling all other methods in rapidity, uniformity of action, and efficiency of operation in all latitudes and in all seasons. The enterprise, in its extension and effects has far exceeded the anticipations of its projectors. It has become the prominent feature of the age, in which more general interests are embraced than in any other industrial achievement, or measure of public benefit. In it are not only individual capital and industry embarked to an enormous extent, but the energies of governments themselves are enlisted into a hearty co-operation to carry on a system of improvement which will conduce to the growth and prosperity of a country at large equally with its lakes, rivers and canals.

The progress of railway communication in the old world in its rapidity and extent excited our wonder. Already has she connected her kingdoms by these links of iron, and now nearly one continuous chain runs through the heart of Europe, taking in its course Paris, Brussels, Cologne, Antwerp, the Rhine, Berlin, Warsaw, Leipsic, Vienna, Switzerland and Venice. The "City of the Czars" will soon be but a few days distant from the "City of Popes," and London nearer Paris (only 11 hours distance) than to either of her own Provincial Capitals, Edinburgh or Dublin.

On our own hemisphere railway lines are projected, spanning the continent from ocean to ocean. The maps of the territories of the States, with lines of railroads in operation, in progress, and contemplation marked upon them, crossed and re-crossed like the web of a spider's web, exhibit the vastness of this enterprise. Even Cuba has her 114 miles of railroad. The stupendous enterprises of the Pacific railways, the Panama, Nicaragua and Tehuantepec lines, all create an epoch in the annals of the world's advancement in commercial greatness. The railroad enterprise in the United States surpasses that of any European country, in extent of lines, economy of construction, amount of patronage, and permanency and value of stocks.

The northern, eastern and middle States have almost rivalled the gigantic projects of the old world in number and extent of roads, tying by chains of railway every town, village and city within their sovereignties to their capitals, and connecting one State with another, that the Union between them is made tighter and firmer by this bond, than State leagues and compacts could possibly effect. The southern States are in no wise indifferent to the advantages of railroad improvements; and a spirited and incessant effort through this agency is now being made to counteract the mighty influence which is drawing off the trade of the far west, hitherto tributary to them, to eastern markets.

The resources of a vast extent of country, almost irreclaimable, and unattainable, through this means will be developed; and a great social and commercial revolution worked out for that interesting portion of our national domain.

So long as no great central land route is created to intercept or give direction to the products of the west, the lakes will ever be the great inland "Exchange" of its wealth. The tendency of its trade through these great outlets to the eastern markets has been rapidly growing for years past, and the great commercial cities of the interior, St. Louis, Louisville and Cincinnati, heretofore commanding and controlling its business for southern marts, have become mere changing depots upon the grand chains of communication with the eastern seaboard. New Orleans, up to the year 1835, the successful rival and competitor of New York is fast losing her supremacy over the trade of the great west.—As long as these vast and fertile regions remained an isolated district, a *terra intacta* by any artificial communication with the eastern cities, so long did the great city of the southern seaboard direct and wield the commercial destinies of this territory.—But since the main channels of her commerce were tapped, and foreign connections made with them, her life's blood flowed into these arteries, exhausting the old, and vivifying the new system.—Take the city of New York, as to her influence alone upon the trade of the great west. Located as she is upon an Atlantic bay, giving harbor to the shipping of the world; at the terminus of the Hudson river, having a tide navigation into the in-

terior of the State to an extent of 150 miles, commanding the products of a highly cultivated and wealthy district of country; she, up to the year 1835, yielded to Philadelphia, with far inferior local advantages in point of commercial importance. New York was then shut out from the great inland trade, which sought its market in New Orleans, and those cities more contiguous to the basin of the great west. The disadvantages arising from this too great loss of the chief wealth of the country, induced a vigorous action to secure it, by efficient channels leading to the points of accumulation.—The construction of the Champlain and Erie canals first gave her a grasp upon the treasures of the territory of the northwest. The waters of the Mississippi, soon to become united with those of the lakes by the Illinois and Chicago canal, and through this continuous channel of water communication, with her chains of railway, flow the mighty products of the south, southwest and northwest portions, giving to that city alone produce to the value of \$60,000,000 per annum, equal to two-thirds of our entire foreign commerce. The eastern cities then, from the natural tendency of the trade of the west, must ever become the great discharging reservoirs of its resources, if facilities of intercourse are afforded. It is a feature in railroad communication, that "it is not arrested by drought, nor suspended by frost." During nearly half the year the check upon the traffic of the west, by closed canals, and rivers, and ice-bound lakes, either drives the stocks of produce bordering upon southern channels to southern markets, subject to the various vicissitudes of uncertain navigation and destructive climate, or leaves them in inert destructible heaps along the highways of transportation. Railways in their constant uniformity of action, break this embargo, and give a free and perpetual outlet to the active points of demand and consumption.

Under a full appreciation of the still greater advantages to be derived by a more uniform system of communication with the west, the Eastern States have of late years freely exerted their enterprise and capital to this end. Avenues are being constructed to the boundary of the west at its every point. The attitude which eastern enterprise has assumed of invitation and solicitude to that of the west to bring side by side the great points of production and consumption, and thereby secure incalculable advantages to both sections of the country, is such that no delay or hesitation has been evinced in gaining this mutual benefit. With this view, the State of Ohio, since, 1836, has made a progress in railway undertaking equal to that of any other State. Occupying a midland position between the eastern seaboard and the confines of the great west, she will become at no distant day the arena where the Atlantic cities, from Boston to New Orleans, will throw in their capital and influence to struggle for their moieties of the trade of the western valley which will here concentrate for allotment and distribution. The majority of the lines of railway in this State have for their object the conduction of the trade of the great western valley, drained for the most part by the St. Lawrence and Mississippi rivers, to their northern outlets at Quebec, Boston and New York, though a large portion of the productions of the two great basins of this valley can never be diverted from their legitimate channel to New Orleans. The tendency of this immense travel and property to the lakeshore, and her northern passages only served to enrich the Canadas, and the cities of Boston and New York, while the marts of Baltimore and Philadelphia

were in a measure cut off from any of its advantages.

These latter cities with the design to cope with the northern avenues, and control the vast traffic of the west, projected two of the most stupendous undertakings of which our country can boast, viz., the "Baltimore and Ohio" and "Pennsylvania Central railroad," having their termini at Wheeling and Pittsburg on the Ohio river. On the continuation of the former line from Cumberland to Wheeling, great efforts were at once made to continue this chain through the States of Ohio, Indiana and Illinois to the Mississippi river at St. Louis. Each State through which this route lays became enlisted in the enterprise, and individual capital and industry were bent to the utmost, to further this great undertaking. This grand central chain of railway, or so much of it embraced between Wheeling and the Indiana State-line, comprises two divisions. The first, composing 149 miles between the Ohio river and Columbus, and extends through the counties of Belmont and Guernsey, Zanesville, the capital of Muskingum, Newark, the capital of Licking county, to Columbus, the capital of the State, in Franklin county. The second division, constitutes 99 miles of the chain between Columbus and the Indiana State-line, and is called the Columbus, Piqua and Indiana railroad.* This line passes through Madison county, Urbana, the capital of Champaign, the city of Piqua, in Miami county, and Greenville, the capital of Darke county. It will be noticed that this route lies through a central tier of counties, the most important, populous and wealthy in the state; and taking in its course, for the most part, all of the principal cities in Central Ohio.

At the Indiana State-line a junction is formed with the western trunk of railway extending through Indianapolis to St. Louis. There is created for the State of Ohio a central railroad running on or near the 40th parallel from its eastern to its western border—giving it not only the advantage of an indispensable portion intermediate to a great eastern and a great western chain, but the pre-eminent position of a *terminal chain*, intercepting and concentrating upon it the traffic of numerous canals and railroads which intersect it. Viewing this Ohio line as a constituent part of a gigantic thorough-

* The Columbus, Piqua and Indiana railroad company was chartered February 23d, 1849, with a capital of \$2,000,000, and organized February, 1850, with Judge M. G. Mitchell as President. Subscriptions to this road have been made to the amount of \$500,000 by county townships and individuals. The entire line of 99 miles is under the direction of A. G. Conover, Chief Engineer in preparation for letting. 22 miles will at once be placed under contract, and the balance as soon as ready. The majority of the road from Columbus eastward to Wheeling is in progress of construction, as also portions of the line westward to the Indiana State-line through Indianapolis to St. Louis. Thus the entire line from the Ohio river at Wheeling to the Mississippi will in the space of three years be in full operation, while the other projected connecting lines from Louisville, Jeffersonville, New Albany, Lawrenceburg, Evansville, Terre Haute, Lafayette and Peru, with the Chicago and Winchester road will be made. The immense amount of way and through business necessarily thrown upon the Columbus, Piqua and Indiana road, from the vast operations upon its eastern and western prolongations—the freight and travel passing upon it, by its intersection with the Mad river railroad at Wabash, and the Miami Canal at Piqua—with its heavy local trade, are considerations which must render this line of railway productive of large remunerating profits to its stockholders, and well worthy of the attention of capitalists.

fare extending from the cities of the Atlantic to the Mississippi, and which enterprise in its march may extend to the shores of the Pacific, and thus become "the grand highway of nations;" and regarding it as a chain connecting the whole system of western railways—stretching through regions isolated and unpopulated—establishing and invigorating industrial interests in remote districts—developing and bringing within our reach their hidden wealth; its importance cannot be fully realized, as a means of great commercial advantage, but in establishing the blessings of a social and political state of things wherever it penetrates.

Piqua, O., Nov. 16th, 1850.

AMERICAN RAILROAD JOURNAL.

Saturday, November 23, 1850.

India-rubber Goods for Railroad Purposes.

THE Goodyear Metallic India rubber Co., (F. M. Ray, Agent) No. 104 Broadway, New York, (1 door from Pine street) has on hand and offers for sale at the lowest prices, an extensive assortment of Rubber Goods suitable for Railroad Companies, such as Hose of all sizes, Fire Buckets, Water Pails, Steam Packing, Car Covers, Tarpsaulins, Clothing of all kinds for brakemen, switchmen, etc. Belting, and many other articles—all manufactured from Goodyear's Metallic India-rubber, and warranted to give satisfaction.

India-rubber HOSE is in use upon many railroads, for Tanks and Water Stations. It requires no oiling, is unaffected by heat or cold and is in every respect a most desirable article, and much superior to leather. All sizes, from 1 in. to 6 in., or larger if needed, made to order.

The reputation of India-rubber for steam packing is well established, and it is now almost universally preferred to any other kind of packing. It will stand a higher degree of heat and last longer than any other substance. An assortment of every thickness from 1-2d in. to 1 in. always on hand.

Every article sold by the Goodyear Metallic India-rubber Co. is warranted, and will be offered to railroad companies at the lowest factory prices.

The Goodyear Metallic India-rubber Co. is a connection of the New England Car Co., and in addition to its large stock of goods for railroad and other purposes, has on hand a large assortment of F. M. Ray's Patent India-rubber Car Springs, both bearing and buffer, of all sizes.

Great Work on Bridge Building, etc., etc.

JUST published in medium folio, One Dollar, 75 cts. to subscribers.

Part III of a "THEORETICAL AND PRACTICAL TREATISE ON THE CONSTRUCTION OF BRIDGES IN STONE, IRON AND WOOD," including the Equilibrium of Arches, the mathematical principles of the Oblique Arch, Suspension Arch, etc., Construction of Foundations in Water, Centering, Oblique Arches, etc., the application of Iron to Railroad Structures, Practical Tunnelling, Suspension Bridges, etc.; illustrated by numerous accurately executed Plans, Elevations, Sections and Details of Stone, Iron and Wood Bridges, Viaducts, Tunnels, Culverts, Machines, etc., constructed by the most eminent Architects and Engineers in Europe and the United States, and numerous Original Designs for Bridges, Viaducts, Culverts, etc. The whole calculated to meet the exigencies of Engineers, and assist Draughtsmen, Bridge Builders, Mechanics and Students. By George Duggan, Architect and Civil Engineer.

The present part contains beautifully executed plans, elevations, sections, and details of the Cast Iron Girder Bridge on the South Eastern R.R., and the Timber Viaduct with Stone Piers and Abutments and Arches 120 feet span on the Newcastle and Northfields R.R., accompanied by Articles on the construction of foundations, including Piling, Cofferdams, Concrete, etc.

Published by George Duggan, 300 Broadway, New York, to whom all communications should be addressed and subscriptions forwarded.

Parties remitting Mr. Duggan \$5. and the remainder \$4 when they have been supplied with the first six parts of the "Theoretical and Practical Treatise on Bridge Building, etc.," shall receive it monthly as published. To those making Mr. Duggan a present remittance of \$9, the work will be forwarded post free to any part of the United States.

Boardman's Patent Improved Steam Boiler and Furnace.

THE Patentee is now prepared to sell in-lets or territorial rights to the use of the above named improvement. Recent experiments have demonstrated that this form of Boiler effects a saving of one half the fuel required to run the best Cylinder Boiler with return flues, and about 40 per cent. of the amount used by Locomotive Boilers. The heat is so thoroughly applied to the water that the temperature in the chimney is reduced below 140 deg. The smoke and combustible gases are consumed within the furnace. The refuse gas instantly extinguishes flame or sparks, so that all danger from sparks is avoided. This Boiler is very compact in form, occupying less space than any other of like power.

References—Thomas H. Faron, Chief Engineer U. S. Mail Steamer Arctic, N.Y.; Messrs Mott & Ayres, and Mr. D. F. Jaycox, Chelsea Iron Works, 26th street N.Y.; Messrs. Tugnot, Dally & Co., Franklin Forge, 1st avenue, N.Y.; Mr. John Mills, Machinist, 319 5th street, N.Y.; Mr. W. C. Smith, St. Albans, Vermont; and Messrs. Goulding, Green & Conro, Keeseville, N.Y. Address post paid, H. BOARDMAN, New York.

To Contractors.

SIXTEEN MILES of the Grading and a portion of the Masonry of the South Side Railroad, extending to a point opposite Farmville, will be let on the 17th of December next. The work is to be finished by the 1st of January, 1852.

Profiles, Plans and Specifications, will be ready for inspection at Petersburg by the 10th of December.

C. O. SANFORD,

Chief Engineer.

South Side Railroad Office, }
20th December, 1850. }

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Wrought Iron Chairs for Railroads.

It has always been felt, that there are serious objections to the common cast iron chair in use on railroads. These have, on some roads, been entirely dispensed with, and the rail has been confined in its place by spikes alone. The necessity, however, of some kind of a chair is admitted, and attention is now turned to the invention of a wrought iron one, which shall obviate the objection to which the cast chair is liable, and secure all the advantages of its use. We have been shown a specimen of an imported wrought iron chair, by the Agent of the Britain Ferry Iron Co., which appears well adapted to its use. It is similar to the chairs which have recently been put down on the Cleveland and Columbus railroad. It can be furnished at a much less cost than the cast chair, to which we believe it to be much superior in all respects. We are fully satisfied that wrought iron chairs will soon take the place of cast, on all our roads.

Boardman's Improved Steam Boiler.

We beg leave to refer our readers to an advertisement in another column of an improved locomotive and stationary boiler. The maker claims to have invented one that consumes *all the smoke*, or rather *all the fuel* supplied; and that consequently generates much more steam than any now in use. We have carefully examined one of these boilers, which has been in constant use in this city for six months past; and we are fully satisfied that it is all that is claimed for it. Its shape may be termed that of an *upright conical boiler*, though the form may be varied as the case may require. The tubing, instead of running through the boiler horizontally, is inserted vertically in a projection which runs entirely around it with the exception of the front. This projection is about three feet above the surface of the fire, and extends a short distance below the bottom of the grate, where the tubes terminate in a smoke chamber connecting with the chimney. This makes the top fire chamber much larger than the bottom, the projection or drawing in of the boiler in the one examined, being sufficient to allow three rows of tubes.

To secure a supply of a sufficient quantity of air, a blower is used, which drives a current of air under the grate. The same blower also forces jets of heated air into the top of the fire chamber, which supplies sufficient oxygen for the combustion of all the gases that are evolved, and forces the flame and any moisture that the fuel may contain, down through the upright tubes, into the smoke chamber, where are deposited all the cinders and ashes. The great merit of the improvement, in our opinion, exists in creating the draft by the pressure of the air thrown into the fire chamber, which is sufficient for this purpose, (forcing the colder portions of the air through the tubes,) and to consume completely everything combustible, and prevent for the same reason the escape of any sparks or cinders. So perfectly is the heat absorbed by the boiler that the mercury will not rise in a thermometer placed in the top of the chimney, to 140°, when the engine is doing full duty.

It is very difficult to give a description which can be readily understood, without drawings. We have stated sufficient, however, to an understanding of the principle involved. It has been carefully examined and tested by some of the best engineers in this city, who pronounce it superior to anything in use, and certify that it completely accomplished all that is claimed for it. As it entirely consumes its own smoke, and as the draft is supplied by pressure the use of chimneys in sea going steamers, may be entirely dispensed with. It is certainly well worth the attention of railroad companies, as it obviates all the objections heretofore existing against the use of coal as a fuel.

Reformation Proposed in our Money or Legal Tender.

By ISAAC BUCHANAN.

The immediate necessity of this arises from the increasing quantity of gold from California—but there is an urgent call for it to prevent all the internal or native interests of the country continuing to be the mere foot ball of the foreign trade. Let it be observed that I draw the distinction between paper money and paper currency thus: paper made a legal tender (or which you are bound to receive in liquidation of a debt) I call *money*; and paper issued by banks or private individuals, which you may or may not receive, I call *currency*. The use of paper money is as a standard for the currency, and of money a very small amount will do where banking exists in a full and healthy proportion to the wants of the community. In the United States the reformation necessary is, that we construe the clause of the constitution of the United States (which requires the legal tender to be metallic) to mean "secured by the precious metals or not credit paper." We must in fact retain gold as a security, but not as a standard of the currency; or in other words, our five dollar note must mean *five dollars worth of gold*, not a quarter of an ounce or any certain weight of gold. The best way to effect this is to let the sub-treasury issue no more precious metals till there is a given sum—say fifty millions—in its vaults, but issue in its stead evidences of the deposit of these precious metals, which would form a paper or emblematic legal tender that could not depreciate from insecurity, and than this (insecurity), there is no cause of money depreciating, (other things that are called depreciations being only the appreciation of gold or other commodity).

The necessity of such a measure in the view of increasing stocks of gold, is self-evident; but there is much more urgent call for the reformation of our

money as the only means of disenthraling our home trade and industry from the malign influence of the foreign trade under which these are made (by our money law) to suffer equally, as in England, from our following England in her monetary legislation. Nothing but the vast sums of money brought into this country by emigrants each year, keeps the currency right, and prevents the loss of all confidence in business, or the downfall of all banking credit. When the foreign traders choose to over-import, the loss would only be to themselves by my plan; but at present all classes are made to suffer, and often to be overwhelmed by this folly of the importers of goods, a thing beyond their control. Whenever undue imports occur, the precious metals become in demand for export, to balance our trade with foreign countries; but it is found that by our money law, we have violated "the law of supply and demand," as respects gold and silver coin, and away goes our money to vivify the industry of other countries, because they are commodities which are kept down in price even when they rise in value, in consequence of increased demand as a commodity. The foreigner thus has the advantage of us, as to him gold and silver are commodities, while to the home trade they are only a money.—And even when gold and silver is not taken in any great quantity, this is only prevented by the most cruel reduction of prices to every branch of native industry and American stocks; for under our present insane system high prices cannot exist without necessarily producing distress, or low prices, thus: a foreigner brings this month goods to New York, and sells them say for two eagles or twenty dollars, or otherwise an ounce of gold. This gold he might carry away out of the country, but because he finds American trade in a dull state, and prices very low, he takes away something of American growth, leaving the money to revive American trade; he takes say 200 pounds of cotton, at 10 cents, \$20; but three months hence he may come with a similar lot of goods, and for them get two and a half eagles, or twenty-five dollars, because of the revival of the home trade of the country; there is however a general prosperity or rise in price, so the foreigner finds he can get no more cotton, although he got twenty per cent. more gold, he finds that he can only get 200 pounds of cotton, because the price is now 12½ cents; the cotton in a word has risen in price, the gold in quantity! so the foreigner takes the gold, and every interest in the country is ruined, because in removing what to him is only a commodity, he removes what to them is by law, money, the life's blood of the trade. Cotton and every other commodity falls to a level with this profitless untaxed article, gold, to prevent its leaving the country, and increasing the paralysis which its exit has introduced into all stocks, and into every department of American industry, however disconnected with foreign trade.

Under the reformation of the currency here proposed, the prosperity or greatest employment of the people would be attained. The question of employment is the great point in every country, and to subserve this the paper money secured by gold and silver ought to be increased to the extent the gold rises in value (or in other words becomes scarce), in order to fill the vacuum in the circulating medium. Below a certain point, however, the paper money ought not to be permitted to fall, (say fifty millions of dollars) and, to keep specie enough in the vaults of the sub-treasury to meet this amount at the specie's market price, there should be a yearly tax on the country to the extent of the gradual de-

preciation of the gold and silver held. If the State was called on to make good the amount of depreciation on specie to the amount of the whole circulation, it would be a most serious thing, but this is only proposed to be the case to the amount of the legal tender paper, which may be required to form one standard of value all over the Union, as representing the value of the precious metals at the American (not a fixed or foreign) market value. The \$5 bill would state on its face that a quarter of an ounce of gold is held in the sub-treasury, and that this piece of paper therefore representing five dollars worth of gold, is equivalent to a quarter of an ounce of gold when the foreign exchanges are at par, to less weight in gold when the foreign exchanges are against the United States, and to more weight of gold when the foreign exchanges being in our favor gold is in less demand and has a less value. By this means, and this means alone, can the foreign merchant and the money monger be brought to feel themselves in the same boat with American industry, for it will become (under the law now proposed as a monetary reformation) interested in pushing our exports and limiting our imports, (the greatest national economy) as thus alone can the precious metals be brought down in value, and their paper money be made to stand for more gold and commodities.

The Coal Trade for 1850.

The quantity sent this week by railroad is 48,482 04 tons, 751 tons less than last week. There was no interruption in the trade during the week, and the result confirms the opinions we expressed last week, that the company would not transport 50,000 tons in any one week again this season.—The cold, frosty mornings interfere considerably with transportation, even when the weather is otherwise favorable. We have no new feature in the trade to notice.

Amount of coal sent over the Philadelphia and Reading railroad for the week ending on Thursday evening last:

	RAILROAD.		CANAL.
	Week.	Total.	Total.
Pt. Carbon..	17,287 19	425,388 17	129,478 69
Mt. Carbon..	5,985 18	165,049 13	40,381 09
S. Haven..	18,631 02	482,741 07	93,418 13
Pt. Clinton..	6,778 04	156,444 00	24,852 03
	48,482 04	1,230,623 17	288,030 07
		288,030 07	

Total by RR and canal. 1,518,654 04

To same time last year—Railroad.... 1,047,916 15

Canal..... 437,682 09

1,485,598 04

Increase this year, so far, tons, 83,055 00.

[Pottsville Jour.]

Ohio.

Central Railroad.—There is now a corps of engineers employed on the Ohio Central road between Zanesville and Bridgeport, making definite locations, and they have progressed as far as Morristown eastward. We are informed by the best authority, that they make the distance eleven miles less than under the estimates of Mr. Knight. His estimates, from reconnaissance, were 95 miles distance. The present survey makes it not exceed 84 miles. The route, we learn, is well adapted to the construction of a road. The grade on much of it is nothing, and on very little over 40 feet. The estimates, from the route thus far surveyed, are that the road can be graded, bridged and prepared for 10,000 dollars per mile, or \$480,000 dollars for the whole route. Iron can now be contracted for at 44 dollars per ton, or \$390,280 for the whole route.—We have then a cost of the whole route of \$1,430,280.

New York.

Sackett's Harbor and Saratoga Railroad.—The subject of constructing a railroad from Sackett's Harbor to Saratoga is attracting a good deal of attention along the line of the proposed road.—The distance is about 140 miles. The route has been surveyed, and stated to be very favorable. It is also stated that a large amount of means can be had for the work.

This road may be built, but we cannot ourselves see any reason to believe it will be, neither do we see any necessity for it. It will not materially shorten the distance between Sackett's Harbor and Albany, which are soon to be connected by means of Rome and Watertown railroad. The country to be traversed by the proposed railroad is for a large part of the way a forest, and we can see no reason for an additional road to one already existing, and occupying a much more favorable line. If the people interested in this project are desirous of building a railroad let them take up some line that is really needed, and bids fair to pay.

The *Utica and Schenectady Railroad Company* have declared a dividend of 25 per cent from their reserved fund, and also at the same time voted a service of plate to the President of the road, Mr. Corning, for his long and valuable services, for which he has always declined to receive any compensation. This is a well-deserved compliment to one of the most energetic and accomplished railroad officers in the country.

Pennsylvania.

Columbia Railroad.—On Saturday last the Canal Commissioners effected a sale of that portion of the Columbia railroad extending from Broad street near Callowhill to the foot of Inclined Plane, including the substantial stone bridge over the Schuylkill at Peters' Island, for \$243,200. The Reading railroad company was the purchaser, through their President, John Tucker, Esq. The payments are to be made as follows—\$25,000 cash at time of sale, \$50,000 on the first day of April, 1851; and \$10,000 monthly thereafter until the whole sum is paid. We are gratified to learn that this sum is to be appropriated to the straightening and improving the remaining portion of the road.

Schuylkill Navigation.—On Monday last the Schuylkill Canal was opened from Phoenixville to Reading, which again places the canal in complete navigable order between this city and Reading.—This will afford to the business men along the line the advantages resulting from the lumber and grain trade of the Union Canal, which has for some weeks been in navigable order throughout its length.—*Phila. Shipping List.*

Ohio.

Steubenville and Indiana Railroad.—The *Wheeling Gazette* says that the subscription to the stock now amounts to six hundred thousand dollars, and an agent leaves Steubenville this week for Philadelphia, to increase that stock. He will then go to Cincinnati, Columbus, &c.

Virginia.

South Side Railroad.—We learn from the last Farmville Republican, that quite a spirited meeting of the friends of the South Side railroad, was held in that town on the day and night of the 8th inst. The Rev. Dr. Rice was chosen Chairman, and after opening the proceeding in an appropriate address, he was followed by W. C. Flournoy and J. B. Anderson, when a sumptuous repast prepared for the occasion was partaken of. After night, Col. W. W. Forbes and others were called out in public

speeches, which did full justice to the important work they have undertaken. More than twenty thousand dollars was subscribed to the stock of the company.

Notice to Contractors.

PROPOSALS will be received at the offices of the Baltimore and Ohio Railroad Company, at Baltimore, Cumberland, Fairmount and Wheeling, until **SATURDAY**, the 24th of November next inclusive, for the Graduation and Masonry of about 33 sections or miles of the line, extending westwardly by the waters of Fish Creek and Grave Creek, and over the dividing ridges between them, from the 160th section of the part of the line already let, to the 204th section of the same line—being the only portion of the route remaining to be put under contract.

The work to be let will be generally heavy—including a tunnel of 2450, another of 1250, and a third of 400 feet in length, a number of deep cuttings and embankments, and a considerable quantity of Bridge Masonry. Specifications will be ready at the above offices, on or after the first day of November, and Engineers will be upon the line to give information.

No bid unsupported by good testimonials will be considered, and bidders are desired to state if they have other work on hand, and when it will be finished. The most energetic prosecution of the work will be expected.

By order of the Board of Directors.

BENJ. H. LATROBE,
Chief Engineer.

To Contractors.

ENGINEER'S OFFICE TROY & BOSTON R.R., }
Troy, November 5, 1850. }

PROPOSALS will be received by the subscriber until November 20th, 1850, for the Grading, Masonry and Fencing of the unoccupied sections of the Troy and Boston Railroad—between Hoosick Falls and Troy—viz: sections 3, 4, 5, 6, 7, 8, 10, 14, 17, averaging one mile each.

Plans and specifications may be seen on application at this office.
S. F. JOHNSON,
Chief Engineer.

Rochester Scale Works.

ESTABLISHED IN 1841.

THE Subscribers are manufacturing and prepared to furnish upon order all kinds of Scales, such as Canal Weigh Lock Scales, from 100 to 400 tons capacity,

Railroad Track and Depot Scales,
Cattle, Coal, and Hay Scales,
Dormant and Wheat or Hopper Scales,
Portable Platform, and Counter Scales,
Sugar Crushers, Letter Presses,
Warehouse Trucks, Wheat Cars, etc., etc.

Our long experience in the business, and the facilities we have for manufacturing, enables us to supply all orders promptly. Every article made of the best material and warranted.

REFERENCES:

J. W. Brooks, Supt. Michigan Central R.R., Mich.
Benj. Loder, Prest. N. Y. & Erie R.R., New York
Charles Minot, Supt. do. do. do.
The Hon. Board of Canal Commissioners and Engineers of Erie Canal Enlargement.
E. F. Osborn, Supt. Mad River & Lake Erie R.R., O.
Sam'l Brown, Chief Clerk Freight Department New York & Erie R.R., New York.
John Wilkin-on, Prest. Utica & Syracuse R.R., N.Y.
John B. Turner, Supt. Galena & Chicago R.R., Ill.
M. Shout, Supt. N. Y. & Harlem R.R., N.Y.
Charles Dutton, Supt. Roch. & Syracuse R.R., N.Y.
Henry Martin, Prest. Buffalo & Attica R.R., N.Y.
John Crookford, Agent Patterson & Hudson River R.R., New Jersey.
D. C. McCallum, Supt. Bridges & Buildings N. Y. & Erie R.R., N.Y.
B. Higgins, formerly Supt. Mansfield & Sandusky City R.R., Ohio.
A. H. Barber, Agent Mansfield and Sandusky City R.R., Ohio.
Charles Butler, Prest. Board of Trustees Wabash & Erie Canal, Indiana.
Jesse L. Williams, Chief Engineer Wabash & Erie Canal, Indiana.

DURYEE, FORSYTH & CO.,

No. 15 Water St., Rochester, N.Y.
General Depot and Scale Warehouse,
No. 205 Pearl St., New York.

Railroad Spikes, Boiler Rivets, etc.

THE Subscribers, Agents for the sale of James S. Spencer's, Jr., Railroad and Boat Spikes, Boiler Rivets, and Wrought Iron Chairs for Railroads, made at his Works near this city, will execute all orders with promptness, despatch, and of the best quality.

ALSO IMPORTERS of English refined and Merchant Bar Iron; Extra refined Car and Locomotive Axles (from 3½ to 6½ inches in diameter); B. O. Locomotive Tire (welded by Baldwin). Also, supply Boiler and Flue Iron cut to pattern or otherwise.—Spring, Shear, and Cast Steel, etc., etc., etc.

T. & E. GEORGE.

Philadelphia, November 11, 1850.

Notice to Contractors.

ATLANTIC & ST. LAWRENCE RAILROAD.

PROPOSALS will be received by the subscribers, at Leary Tavern, in the town of Gorham, New Hampshire, until the 30th of November, for the Grading and Masonry of that portion of the Atlantic and St. Lawrence Railroad extending from Peabody's River in said Gorham, to the Connecticut River, a distance of about 30 miles.

Plans and profiles will be in readiness for examination after the 20th inst., at the Engineer's office at Gorham, N. H.

This line embraces some heavy work, and Contractors of means and experience will find this notice worthy of their attention.

Spirituous liquors will not be allowed on or about the work; nor will the propositions of Contractors be considered, who have heretofore failed to pay the laborers employed, on this, or any other public work.

Cash payments will be made monthly, reserving ten per cent. until the final completion of the contract.
WOOD, BLACK & CO.

Portland Nov. 5, 1850.

NOTICE

For Proposals for Railroad Iron, for the Alabama and Tennessee River Railroad,

TO BE MANUFACTURED FROM ALABAMA ORE.

THE Alabama and Tennessee River Railroad Co. invite proposals, until the 1st of January, 1851, for Iron Rails, to be made of Alabama Iron, for the Northern Division and part of the Southern Division of their road, embracing a distance of about 105 miles. The rails are to be of the H pattern, in lengths of 18 feet, and weighing 63 lbs. per lineal yard. They are to be delivered on the Coosa river, at a landing to be hereafter designated, between Kimulgee ferry and Fort Williams, commencing their delivery on the 1st of November, 1851, and continuing it at the rate of from 80 to 100 tons per week, until the whole quantity required (10,500 tons) shall have been delivered. They are to be inspected by Lewis Troost, Chief Engineer.

It is proper to state to iron masters and capitalists at a distance, that the country traversed by the Northern and part of the Southern divisions of the road abounds in excellent iron ore and bituminous coal, and possesses every advantage for the successful manufacture of iron, health, cheap labor and provisions.

Further information may be obtained by addressing the President of the Company at Selma, Ala.

By order of the Board of Directors.

J. W. LAPSLEY, President.

Great American Engineering

AND MECHANICAL WORK, just published in

A medium folio One Dollar, 75 cts. to Subscribers.
Part IX, of "Specimens of the Stone, Iron & Wood Bridges, Viaducts, Tunnels, Culverts, &c., &c., of the United States Railroads." By George Duggan, Architect and Civil Engineer.

The present part contains beautifully executed plans, elevations, sections and details of the Timber Bridge—34ches 150feet span—over the La-kawaxen river, and Delaware and Hudson canal on the line of the N. Y. and Erie R.R., and of an improved R.R. Suspension Bridge. Invented and patented by Joseph C. Avery, of the C. C. and C. R.R., Cardington, Ohio, with Articles on the Application of Suspension Bridges to R.R. purposes, and explanatory of the engravings of the Timber Bridge across the Patuxent river, at Elysaville, on the line of the Balt. and Ohio R.R.

Published by

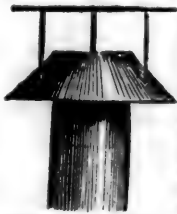
GEORGE DUGGAN,

300 Broadway, New York.

To whom all communications should be addressed, and subscriptions forwarded.

Emerson's Patent Ventilator,

ADAPTED to Cars, Engine houses, Public Halls, Factories, Churches, School Houses, Dwellings, Chimney Flues, etc.



This Ventilator is stationary, and cannot get out of order. It is constructed in such conformity to certain ascertained laws of pneumatics, as to insure a constant draft outward, whatever may be the changing direction of the wind. The Massachusetts Mechanic Association have awarded a gold medal to the Inventor, and the Manufacturers have already disposed of over

3,000 of the article. Manufactured and sold by
CHILSON, ALLEN, WALKER & Co.,
351 Broadway, New York.

Providence Tool Co.,

MANUFACTURERS OF

Plane Irons, Tooth Irons, S ft Moulding and Rubber Irons, Cornice Irons, Plow Bits, and Planing Machine Knives:

NUTS, WASHERS AND BOLTS.

—ALSO—

PLATE HINGES AND PICK AXES.

They are prepared to execute orders for all descriptions of Cold Punching and Job Work:

WM. FIELD, Agent. RUFUS WATERMAN, Treas.
PROVIDENCE, R. I.

Ibbotson, Brothers & Co's CELEBRATED CAST STEEL

AND

Best Cast Steel Royal Improved Files, well known as better adapted for Engineers' and Machinists' purposes than any now in use in the United States.

Every description of Square, Octagon, Flat and Round Cast Steel, Sheet, Shovel and Railway Spring Steel, etc., and Steel to order for any purposes—manufactured at their works in Sheffield—and universally known by the old stamp "Globe."

HENRY I. IBBOTSON, Agent,
218 Pearl st., New York.

Faggotted Car and Engine Axles

FORGED by **RANSTEAD, DEARBORN & Co.,**
Boston, Mass.

These Axles enjoy the highest reputation for excellence, and are all warranted.

American Cast Steel.

THE ADIRONDAC STEEL MANUFACTURING CO. is now producing, from American iron, at their works at Jersey City, N.J., Cast Steel of extraordinary quality, and is prepared to supply orders for the same at prices below that of the imported article of like quality. Consumers will find it to their interest to give this a trial. Orders for all sizes of hammered cast steel, directed as above, will meet with prompt attention.

May 24, 1849.

GRAHAM'S COMPOSITION, to Remove and Prevent Incrustation (or Scale) in STEAM BOILERS.

THIS valuable composition having been fully and extensively tested, is now offered to the public, as a sure remedy and preventive for incrustations in steam boilers of all descriptions. By its use, all scale is entirely removed from the boilers of Ocean and River Steamers, Locomotive and Stationary Engines, in from 3 to 20 running days, according to the size of the boiler and thickness of the scale. In New Boilers, all incrustation is prevented at a trifling expense.

The preservation of the boiler, great economy of fuel and labor, safety, and increased speed, are among the advantages to be derived from the use of this composition.

Orders should state the quality of water used, viz: "Salt," "Fresh," or "Brackish."

For sale, with directions for use, by
W. H. NEWMAN,
75 Pearl street,
New York.

TESTIMONIALS.

New York, August 17, 1850.

We have used Graham's Composition in the boilers of the Steamship Southerner, during several voyages between this place and Charleston. The boilers were old and very foul with scale, a very large quantity of which was removed by the use of the composition, and no new scale was formed.

From our own experience and observation in the use of the article, we are fully satisfied that it will effectually remove the incrustation made by sea water, and also that it will effectually prevent its formation. We are also satisfied that the use of it will be attended with a great saving of fuel, and that it has no injurious effect upon iron.

DAVID N. MAXON, Engineer,
BERRY, Master,
Steamship Southerner.

Steamship Philadelphia,

New York, August 27, 1850.

I have used "Graham's Composition for Steam Boilers," in the boilers of Steamship Philadelphia, on the voyage to and from Chagny, and am entirely satisfied that it will remove, dissolve and prevent all scale or incrustation in salt water boilers.

For the preservation of the boiler and economy of fuel and labor, I hereby recommend the employment of this composition in the Boilers of Ocean Steamers.

WM. BISBY,
Chief Engineer.

Newly Iron Works,

New York, July 5, 1850.

We have examined the specimen of Graham's Composition for preventing incrustation of steam boilers, and we believe it may be used with perfect safety in reasonable quantities for the purpose intended, as there does not appear to be any agent in the composition calculated to injure the iron.

STILLMAN, ALLEN & CO.

Piermont, May 20, 1850.

I have used "Graham's Composition," and find it to produce the intended effect; and I hereby, without hesitation, recommend it for Stationary, Marine and Locomotive Engine Boilers.

JOHN BRANDT,
Superintendent Motive Power
New York & Erie R.R.

New York, July 25, 1850.

In answer to many inquiries as to the practical effect of "Graham's Composition," I will state that I have used it in the boiler of the Steamboat Sunwick, which had become considerably incrustated with hard scale from both salt and fresh water. We need 10 lbs. per day, for three days, without blowing off the water, until the fifth day, when all was drawn off. To our astonishment, we found the whole interior of the boiler as clear of scale and smooth as when it came from the hands of the maker. The following week, we tried the same quantity in a small steam tow boat. The boiler had old scale of long accumulation and very thick. We ran the boat three days without blowing off, and on the fourth day washed out the boiler and found it, like the "Sunwick's," perfectly clean and smooth as when new. I am therefore enabled to state that the use of the composition in these two instances under my own immediate observation and direction, has been attended with complete success.

JAMES MORROW,
Engineer Astoria Ferry.



To Merchants, Railroad Companies, Machinists and Boiler Makers.

THE subscribers beg leave to call attention to their very large stock of Iron and Steel—of American, English, Swede and Norway make—of all the different kinds in use. Also, Railroad Iron, Ship, Boat and Railroad Spike. They are also Agents for the Best Pennsylvania Locomotive Boiler and Tank Iron, each sheet of which will be stamped and warranted, at lowest mill prices. Our prices for all kinds of iron will be found very low, either for cash or approved credit.

BRINK & DURBIN, Philadelphia.

ENGINEERS.**Atkinson, T. C.,**

Alexandria and Orange Railroad, Alexandria, Va.

Bancks, C. W.,

Civil Engineer, Vicksburg, Miss.

Buckland, George,

Troy and Greenbush Railroad.

Clement, Wm. H.,

Little Miami Railroad, Cincinnati, Ohio.

Cozzens, W. H.,

Engineer and Surveyor, St. Louis, Mo.

Alfred W. Craven,

Chief Engineer Croton Aqueduct, New York.

Davidson, M. O.,

Eckhart Mines, Alleghany Co., Maryland.

Fisk, Charles B.,

Cumberland and Ohio Canal, Washington, D. C.

Felton, S. M.,

Fitchburgh Railroad, Boston, Mass.

Floyd-Jones, Charles,

South Oyster Bay, L. I.

Gzowski, Mr.,

St. Lawrence & Atlantic Railroad, Montreal, Canada.

Gilbert, Wm. B.,

Rutland and Burlington Railroad, Rutland, Vt.

Grant, James H.,

Nashville and Chattanooga R. R., Nashville, Tenn.

S. W. Hill,

Mining Engineer and Surveyor, Eagle River, Lake Superior.

Holcomb, F. P.

Southwestern Railroad, Macon, Ga.

Johnson, Edwin F.

New York and Boston Railroad, Middletown Ct.

Latrobe, B. H.,

Baltimore and Ohio Railroad, Baltimore, Md.

Miller, J. F.,

Worcester and Nashua Railroad, Worcester, Mass.

Morris, Elwood,

Schuylkill Navigation, Schuylkill Haven, Pa.

Morton, A. C.,

Atlantic and St. Lawrence Railroad, Portland, Me.

McRae, John,

South Carolina Railroad, Charleston, S. C.

Nott, Samuel,

Lawrence and Manchester Railroad, Boston.

Prichard, M. B.,

East Tennessee and Georgia R. R., Cleveland, Tenn.

Roebbling, John A.,

Trenton, N. J.

W. Milnor Roberts,

Bellefontaine and Indiana Railroad, Marion, Ohio.

Roberts, Solomon W.,

Ohio and Pennsylvania Railroad, Pittsburgh, Pa.

Sanford, C. O.,

South Side Railroad, Virginia.

Schlatter, Charles L.,

Northern Railroad (Ogdensburg), Malone, N. Y.

Sours, Peter,

Rahway, New Jersey.

Stark, George.,

Boston, Conn. and Mont. R. R., Meredith Bridge, N. H.

Steele, J. Dutton,

Pottstown, Pa.

Trautwine, John C.,

Panama Railroad—Address through office of Panama Railroad Co., 72 Broadway, N. Y.

Trimble, Isaac R.,

Philad., Wil. & Baltimore Railroad, Wilmington, Del.

Tinkham, A. W.,

United States Fort, Bucksport, Me.

Thomson, J. Edgar.,

Pennsylvania (Central) Railroad, Philadelphia.

Troost, Lewis,

Alabama and Tennessee Railroad, Selma, Ala.

Whipple, S.,

Civil Engineer and Bridge Builder, Utica, N. Y.

Williams, E. P.,

Auburn and Schenectady Railroad, Auburn, N. Y.

Williams, Charles H.,

Milwaukee, Wisconsin.

HOTELS.**Exchange Hotel,**

Adjoining Eastern Railroad Depot,

BUFFALO, N. Y.

BY.....**FISS & SPERRY,**

Late of Delevan House, Albany.

J. D. Abraham, Architect,

NO. 300 MAIN STREET,

BUFFALO, N. Y.

Fountain Hotel,

LIGHT STREET, BALTIMORE,

P. THURSTON.....Proprietor.

DUNLAP'S HOTEL,

On the European Plan,

NO. 135 FULTON STREET,

Between Broadway and Nassau St.,

NEW YORK.

MANSION,

Corner of Maine and Exchange Streets,

P. DORSHIMER. BUFFALO.

GUY'S**United States Hotel,**

(Opposite Pratt street Railroad Depot.)

BALTIMORE.

JOHN GUY.

WILLIAM GUY.

American Hotel,

Pratt street, opposite the Railroad Depot,

BALTIMORE.

HENRY M. SMITH.....Proprietor.

Lat. of the Exchange & St. Charles Hotels, Pittsburgh.

Washington Hotel,

BY JOHN GILMAN,

\$1 Per Day.

No. 206 Pratt street, (near the Depot.)

BALTIMORE.

Barnum's City Hotel,

MONUMENT SQUARE, BALTIMORE.

This Extensive Establishment, erected expressly for a Hotel, with every regard to comfort and convenience, is situated in the centre and most fashionable part of the city, and but a few minutes' walk from the Railroad Depots and Steamboat Landings.

The House has lately undergone a thorough repair, embracing many valuable improvements, and will accommodate 250 Guests.

BARNUM & CO.

JONES' HOTEL,

NO. 152 CHESTNUT STREET,

PHILADELPHIA.

Business & War, Proprietors.

BUSINESS CARDS.**Lithography.****JOHN P. HALL & CO.,**

161 Main st., Buffalo, (Commercial Advertiser Build.)

Are prepared to execute all kinds of Lithography in good style and at reasonable rates. Particular attention will be paid to Engraving Railroad Maps, Engineer's Plans and drafts, etc., and orders in this line are respectfully solicited.

J. T. Hodge

Will attend to the examination of mining tracts near Lake Superior, and prepare Reports and Maps.

Address, during the Summer,

[Ontanagon Postoffice, Lake Superior.

Cumberland Steam Coal,

FROM THE

FROSTBURG MINES, MD.

H. A. TUCKER,

Agent of Frostburg Coal Co.

No. 50 Wall Street, New York.

Eaton, Gilbert & Co.,Railroad Car, Coach and Omnibus Builders,
TROY, N. Y.**Charles T. Jackson, M. D.,**

STATE ASSAYER, late Geologist to Maine, Rhode Island, New Hampshire, and the United States, offers his services to his friends and the public in making any Chemical, Mineralogical or Geological researches that may be required for the improvement of Agriculture and the Manufacturing Arts. Particular attention will be paid to the exploration of mines and to assaying of ores of the metals.

State Assayer's office, 31 Somerset st.
Boston Sept. 3, 1850.**STEEL AND FILES.****R. S. Stenton,**

20 CLIFF STREET, NEW YORK,

AGENT FOR

J. & RILEY CARR,BAILEY-LANE WORKS, SHEFFIELD,
Manufacturers of Cast, Shear, German, Blister, and
Spring Steel,

Of all descriptions, Warranted Good.

FILES.

Manufacturers of Machinists' Warranted Best Cast Steel Files, expressly for working upon Iron and Steel, made very heavy for recutting.

A full Stock of Steel and Files at all times on hand. 6m4

Walter R. Johnson,

CIVIL AND MINING ENGINEER AND ATTORNEY for Patents. Office and Laboratory, F St., opposite the Patent office, Washington, D. C.

Dudley B. Fuller & Co.,IRON COMMISSION MERCHANTS,
No. 139 GREENWICH STREET,
NEW YORK.**Manning & Lee,**GENERAL COMMISSION MERCHANTS,
NO. 51 EXCHANGE PLACE,
BALTIMORE.Agents for Avalon Railroad Iron and Nail Works.
Maryland Mining Company's Cumberland Coal 'CED'—'Potomac' and other good brands of Pig Iron.**Samuel Kimber & Co.,**COMMISSION MERCHANTS
WILLOW ST. WHARVES, PHILADELPHIA.

AGENTS for the sale of Charcoal and Anthracite Pig Iron, Hammered Railroad Car and Locomotive Axles, Force Pumps of the most approved construction for Railroad Water Stations and Hydraulic Rams, etc., etc.

July, 27, 1849.

James Herron, Civil Engineer,

OF THE UNITED STATES NAVY YARD,

PENSACOLA, FLORIDA,

PATENTEE OF THE

HERRON RAILWAY TRACK.

Models of this Track, on the most improved plan, may be seen at the Engineer's office of the New York and Erie Railroad.

PLUSHES

FOR

Railway Cars & Omnibuses.**F. S. & S. A. MARTINE,**
112 WILLIAM ST., NEAR JOHN.

ARE now receiving a large and complete assortment of Plain and Figured PLUSHES, of their own importation, which will be sold at the lowest market price, viz: Crimson, Maroon, Scarlet, Green, Blue, Purple, etc.

ALSO—CURLED HAIR, the best manufactured in market.

**To Railroad Companies,
Machinists, Car Man-
ufacturers, etc., etc.**

CHARLES T. GILBERT,

NO. 80 BROAD ST., NEW YORK.

IS prepared to contract for furnishing at manufacturer's prices—
Railroad iron,
Locomotive Engines,

Passenger and Freight Cars,
Car Wheels and Axles,
Chairs and Spikes.

Orders are invited; and all inquiries in relation to any of the above articles will receive immediate attention.

**Manufacture of Patent Wire
ROPE AND CABLES,**

For Inclined Planes, Suspension Bridges, Standing Rigging, Mines, Cranes, Derrick, Tilters, &c., by
JOHN A. ROEBLING, Civil Engineer,
TRENTON, N. J.

FORGING.**Ranstead, Dearborn & Co.,**

MANUFACTURERS OF

LOCOMOTIVE CRANKS AND CAR AXLES,

ALSO

WROUGHT IRON SHAFTING,

And All Kinds of Hammered Shapes.

Office 25 Foster's Wharf, Boston.

Henry I. Ibbotson,

IMPORTER of Sheffield and Birmingham Goods.
Also, Agent for the Manufacture of Telegraph Wire.
218 PEARL ST., NEW YORK.

**Cumberland, (Md.,) Coals for
Steaming, etc.**

ORDERS RECEIVED FOR AND FILLED
by **J. COWLES, 27 Wall St., N. Y.**

Samuel D. Willmott,

MERCHANT, AND MANUFACTURER OF
CAST STEEL WARRANTED SAWS,
—AND FILES—

IMPORTER OF THE
GENUINE WICKESLY GRINDSTONES
NO. 8 LIBERTY STREET,
NEW YORK.

Railroad Instruments.

THEODOLITES, TRANSIT COMPASSES,
and Levels, with Fraunhoffer's Munich Glasses,
Surveyor's Compasses, Chains, Drawing Instruments,
Barometers, etc., all of the best quality and
workmanship, for sale at unusually low prices, by
E. & G. W. BLUNT,

No. 179 Water St., cor. Burling Slip,
New York, May 19, 1849.

IRON.

Stickney & Beatty,
DEALERS IN IRON AND IRON
MANUFACTURERS.

AGENTS for the Balt. City Rolling Mill, from which establishment they are prepared to furnish Ellicott's round, square, and flat bar iron, puddled and charcoal boiler plates and billet iron—also agents for the sale of the Laurel, Gunpowder and Locust Grove (Balt.) forge pig irons, Locust Grove and Laurel Irons for car wheels, Caledonian boiler blooms made from cold blast iron, Old Colony anti-Eatam nails, Wm. Jessop & Son's steel, Coleman's blister steel and nail rods, sheet, hoop, band, oval and common English iron.

Nos. 18 and 20 South Charles st., Baltimore.

Car Wheel Iron.

100 Tons "Columbia" No. 2 Cold Blast Charcoal
Iron.

300 Tons "Salisbury" No. 1, do. do.
For sale by **CHARLES T. GILBERT,**
No. 80 Broad st.

New York, Sept. 21, 1850.

Railroad Spikes.

THE subscribers are prepared to make and execute contracts for Railroad Spikes of a superior quality, manufactured by the New Jersey Iron Company, at Boonton.

DUDLEY B. FULLER & CO.
139 Greenwich st. corner of Cedar.

Railroad Iron.

1650 Tons, weighing about 61 lbs. per yard, 40 tons, weighing about 52 lbs. per yard, and 825 tons, weighing about 53½ lbs. per yard, of the latest and most approved patterns of T rail, for sale by
BOORMAN, JOHNSTON & CO.,
119 Greenwich street.

New York, Aug. 26, 1850.

N.B.—B. J. & Co are also prepared to take contracts for English rails, delivered in any of the Atlantic ports of the United States.

Railroad Iron.

THE Undersigned, Agents for Manufacturers, are prepared to contract to deliver Rails of superior quality, and of any size or pattern, to any ports of discharge in the United States.

COLLINS, VOSE & CO.
74 South St.

New York, June 1, 1850.

Railroad Iron.

1,500 Tons weighing 58 lbs. per lineal yard.

500	"	57	"	"
500	"	56	"	"
500	"	60 & 61 lbs.	"	"

Also 2½x flat rails. All the above being of approved patterns. For sale by

DAVIS, BROOKS, & CO.,
68 Broad street.

N.B.—Rails imported on commission, or at a fixed price.

Iron.

Pig Iron, Anthracite and Charcoal; Boiler and Flue Iron, Spring and Blistered Steel, Nail Rods, Best Refined Bar Iron, Railroad Iron, Car Axles, Nails, Stove Castings, Cast Iron Pipes of all sizes, Railway Chairs of approved patterns for sale by
COLEMAN, KELTON & CAMPBELL,
109 N. Water St., Philadelphia.

Railroad Iron.

THE UNDERSIGNED, HAVING made arrangements abroad, are prepared to contract for the delivery of Foreign rails, of approved brands upon the most favorable terms.

They will also make contracts for American rails, made at their Trenton works, from Andover Iron, in whole or in part, as may be agreed upon.

They are prepared to furnish Telegraph, Spring and Market Wire; Braziers and Wire Rods; Rivets and Merchant Bars to order, all made exclusively from Andover Iron. The attention of parties who require iron of the very best quality for special purposes, is respectfully invited.

COOPER & HEWITT,
17 Burling Slip, New York.

February 15, 1850.

Railroad Iron.

THE Undersigned, Agents for Manufacturers, are prepared to contract for the delivery of English, Welsh and Scotch Rails, of any pattern and weight, also for every description of English, Welsh, Scotch, and Swedish Iron, Railway Chairs and Spikes, Rivets, Bolts, Nuts, Washers, Chain Cables, Anchors, Tin Plates, German Spelter, Iron Castings, and every description of Machinery.

WILLIAM BIRD & CO.,
Iron and Tin Plate Merchants,
44 Wall st., New York.

And at 5 Martin's Lane, City, London,
and 140 Buchanan st., Glasgow.

July 27th, 1850.

Railroad Iron.

THE Undersigned are prepared to contract for the delivery of superior make Welsh Railroad Iron of the favorite brand "Aberdare."

JOSEPH BRAMWELL & CO.,
91 Wall street.

40

Glendon Refined Iron.

Round Iron, Band Iron, Hoop Iron,
Square " Flat " Scroll "

Axles, Locomotive Tyres,

Manufactured at the Glendon Mills, East Boston, for
sale by **GEORGE GARDNER & CO.,**
5 Liberty Square, Boston, Mass.

Sept. 15, 1849.

3m37

PATENT HAMMERED RAILROAD, SHIP & BOAT SPIKES.—The Albany Iron Works have always on hand, of their own manufacture, a large assortment of Railroad, Ship and Boat Spikes from 2 to 12 inches in length, and of any form of head. From the excellence of the material always used in their manufacture, and their very general use for railroad and other purposes in this country, the manufacturers have no hesitation in warranting them fully equal to the best spikes in market, both as to quality and appearance. All orders addressed to the subscribers at the works will be promptly executed.

JOHN F. WINSLOW, Agent.

Albany Iron and Nail Works, Troy, N. Y.
The above Spikes may be had at fact prices, of
Erastus Corning & Co Albany; Merritt & Co., New York; E. Pratt & Br. Ter. Es. Annerie Md

**LAP—WELDED
WROUGHT IRON TUBES**

FOR

TUBULAR BOILERS,

FROM ONE AND A QUARTER TO SEVEN
INCHES IN DIAMETER.

THE ONLY Tubes of the same quality and manufacture as those so extensively used in England, Scotland, France and Germany, for Locomotive, Marine and other Steam Engine Boilers.

THOMAS PROSSER & SON, Patentees,
28 Platt street, New York.

Railroad Iron.

THE UNDERSIGNED ARE PREPARED TO contract for the delivery of English Railroad Iron of favorite brands, during the Spring. They also receive orders for the importation of Pig, Bar, Sheet, etc. Iron.

THOMAS B. SANDS & CO.,

73 New street,
New York.

February 3, 1849.

Iron Store.

THE Subscribers, having the selling agency of the following named Rolling Mills, viz: Norristown, Rough and Ready, Kensington, Triadelphia, Pottsgrove and Thorndale, can supply Railroad Companies, Merchants and others, at the wholesale mill prices for bars of all sizes, sheets cut to order as large as 58 in. diameter; Railroad iron, domestic and foreign; Locomotive tire welded to given size; Chairs and Spikes; Iron for shafting, locomotive and general machine purposes; Cast, Shear, Blister and Spring Steel; Boiler rivets; Copper; Pig iron, etc., etc.

MORRIS, JONES & CO.,

Iron Merchants,

Schuylkill 7th and Market Sts., Philadelphia.
August 16, 1849.

1v33

Railroad Iron.

THE MOUNT SAVAGE IRON WORKS, Alleghany county, Maryland, having recently passed into the hands of new proprietors, are now prepared, with increased facilities, to execute orders for any of the various patterns of Railroad Iron. Communications addressed to either of the subscribers will have prompt attention.

J. F. WINSLOW, President

Troy, N. Y.

ERASTUS CORNING, Albany**WARREN DELANO, Jr., N. Y.****JOHN M. FORBES, Boston.****ENOCH PRATT, Baltimore, Md**

November 6, 1848.

Railroad Iron.

THE SUBSCRIBERS ARE PREPARED TO take orders for Railroad Iron to be made at their Phoenix Iron Works, situated on the Schuylkill River, near this city, and at their Safe Harbor Iron Works, situated in Lancaster County, on the Susquehanna river; which two establishments are now turning out upwards of 1800 tons of finished rails per month.

Companies desirous of contracting will be promptly supplied with rails of any required pattern, and of the very best quality.

REEVES, BUCK & CO.

45 North Water St. Philadelphia.

March 15, 1849.

Tredegar Iron Works.

ROLLING MILL, FOUNDRY AND MACHINE SHOPS. The undersigned continues to manufacture at his Works in this city (from best charcoal metal) Bar Iron of every description, embracing—Rounds and Squares, from 1 to 5 inches diameter. Flats, from 1 to 7 inches, all thicknesses. Bands and Scrolls, all sizes. Boiler plate and Plough Iron. Railroad and Locomotive Axles and Tires. Locomotive Frames, Spikes and Plates. Hoops, Ovals, Half Ovals, Half Rounds, Angle, T, L, and indeed every description of Iron usually manufactured, all of which he warrants to be equal to any made in this country. He also manufactures at his Foundry and Machine Shops all descriptions of Railroad Work, say, Locomotives, Railroad Wheels and Axles complete and ready for the road, Railroad Chairs, etc. Also, Marine and Stationary Engines all sizes, Sugar mills and Engines, Horse mills, and every kind of Machinery usually required for the operations of the country. He has paid particular attention to getting up machinery, etc., for Gold Mine operations, and those in want of such work might find it to their advantage to give him a call.

J. R. ANDERSON.
Richmond, Va., Sept. 10, 1850.

CUT NAILS OF BEST QUALITY, BAR IRON (including Flat Rails) manufactured and for sale by
FISHER, MORGAN & CO.,
75 N. Water St., Philadelphia.

Wheel, Forge and Foundry Iron.

LOCUST GROVE Wheel Iron of great strength and superior chilling property.
Balt. Charcoal Forge Iron, from Patuxent, Curtis Creek and Gunpowder furnaces.
Elkridge Foundry Iron, of superior strength and softness. Anthracite and Charcoal Iron from Pennsylvania and Virginia. Gas and Water Pipes, Lamp Posts from Elkridge furnace.

LEMMON & GLENN,
60 Buchanan's Wharf, Baltimore.

**S. S. Keyser & Co.,
IRON WAREHOUSE,**
Corner of South and Pratt Streets,
BALTIMORE, MD.

Selling Agents for the Rough and Ready Bar Iron and Flk Boiler and Flue Iron Rolling Mills, Sarah and Taylor Furnaces, and Wrightsville Hollow Ware Foundry, and Dealers in Bar and Sheet Iron, and Cast, Sheer, German, Blister, Spring and Electroplated Steel, etc., etc.

Smith & Tyson,

GENERAL COMMISSION MERCHANTS,
No. 25 South Charles St., Baltimore, Md.

AGENTS for the Celebrated Columbia Pig Iron, suitable for Car Wheels and Chilled Rolls.
Columbia refined Charcoal Blooms; Refined Charcoal Juniata Billet Iron for Wire; Refined Iron for Bridging, of great strength; Cut Nails, Spikes, and Brads; Railroad Spikes and Wrought Chairs. 221f

Railroad Iron.

CONTRACTS made by the subscribers, agents for the manufacturers, for the delivery of Railroad Iron, at any port in the United States, at fixed prices, and of quality tried and approved for many years, on the oldest railways in this country.

RAYMOND & FULLERTON, 45 Cliff St.

**JOHNSON, CAMMELL & Co's
Celebrated Cast Steel,**

**AND
ENGINEERING AND MACHINE FILES,**
which for quality and adaptation to mechanical uses, have been proved superior to any in the United States. Every description of square, octagon, flat and round cast steel, sheet, shovel and railway spring steel, best double and single shear steel, German steel, flat and square, goat stamps, etc. Saw and file steel, and steel to order for any purposes, manufactured at their Cyclops Steel Works Sheffield.

JOHNSON, CAMMELL & CO.,
100 William St., New York.

November 23 1843.

Bowling Tire Bars.

40 Best Flange Bars 5 1/2 x 2 inches, 11 feet long.
40 " " 5 x 2 " 7 feet 8 in. long.
40 " Flat " 6 x 2 " 11 feet long.
40 " " 6 x 2 " 7 feet 8 in. long.

Now in store and for sale by
RAYMOND & FULLERTON,
45 Cliff street.

RONDALE PIG METAL, MANUFACTURED
and for sale by the Bloomburg Railroad Iron Co.
LINDLEY FISHER, Treasurer.
75 N. Water St., Philadelphia.

Railroad Iron.

2000 Tons, weighing 55 pounds per lineal yard, of the most approved pattern of T rails, in store and to arrive, for sale by
COLLINS, VOSE & CO.,
74 South St.

New York, June 1, 1850.

Railroad Iron.

3,000 TONS C. L. MAKE 63; lbs. per yard, now landing and to arrive.
Also contracts made for future delivery of above superior make English Iron.
300 Tons Banks Best Iron, Round, Square and Flat.
200 " English Bar " " " "
10 " 9-16 Square Iron for Railroad Spikes.
For sale in lots to suit purchasers by
DAVID W. WETMORE.
New York, March 26, 1850. 3m

**WILLIAM JESSOP & SONS'
CELEBRATED CAST-STEEL.**

The subscribers have on hand, and are constantly receiving from their manufactory.

PARK WORKS, SHEFFIELD,

Double refined Cast Steel—square, flat and octagon.
Best warranted Cast Steel—square, flat and octagon.
Best double and single Shear Steel—warranted.
Machinery Steel—round.

Best and 2d gy. Sheet Steel—for saws and other purposes.

German Steel—flat and square, "W. I. & S." "Eagle" and "Goat" stamps.

Genuine "Sykes," L. Blister Steel.

Best English Blister Steel, etc., etc., etc.

All of which are offered for sale on the most favorable terms by
WM. JESSOP & SONS,
91 John street, New York.

Also by their Agents—

Curtis & Hand, 47 Commerce street, Philadelphia.
Alex'r Fullerton & Co., 119 Milk street, Boston.
Stickney & Beatty, South Charles street, Baltimore.
Nov 6, 1848.

Railroad Iron.

B. O. Railway Tires, Railway Wheels,
Scotch Pig Iron, Tin Plates and Banca Tin,
Muntz's Patent Metal Sheathing,
Baltimore Copper.

Contracts for Rails made on behalf of the manufacturers, for delivery at any ports in the United States, at fixed prices.

Bowling Tires and Tire Bars and Scotch Pigs imported to order.

Muntz's Ship-sheathing, and a general stock of Tin Plates and Banca Tin in store, and for sale by
RAYMOND & FULLERTON, 45 Cliff St.

Bowling Iron. Stamped B.O.

Railway Tire Bars, Rivet Iron
Locomotive and other Axles, Locomotive Frame do
Boiler Plates, Bars.
and every other description of this superior Iron.

The subscribers, agents for the sale of Bowling Iron, are prepared to execute orders for importation, especially for railway and machinery uses, with despatch from the manufacturers.

RAYMOND & FULLERTON, 45 Cliff St.

**Lovegrove's Patent Cast Iron
Water and Gas Pipes.**

THE Subscriber, the Inventor and Patentee of the Centrifugal mode of giving form to metallic substances while in a molten state, is preparing to make Cast Iron Water and Gas Pipes, of any dimensions, at prices much lower than they can be made in the old manner, and the pipes warranted to stand a pressure of three hundred pounds to the square inch, and to be soft enough to drill. Steam Engines and all kinds of machinery. Cast Iron Doors and Frames, and Mill Castings of every description, made to order.

THOMAS J. LOVEGROVE,

Machinist and Founder,

West Falls Avenue, below Pratt St., Baltimore.

Railroad Iron.**SPIKES**

Wrought Iron CHAIRS, New Pattern.

THE Undersigned continues to contract, as usual, for the above articles. The reputation already acquired for their excellent quality is a guarantee that strict attention shall continue to be paid to the wants and interests of purchasers.

CHARLES ILLIUS,
20 Beaver St., New York.

**Ray's Patent India Rubber
Car Springs.**

Savannah, Ga., May 22, 1850.

FOWLER M. RAY, Esq.,

Dear Sir: I have no hesitation in saying, after having used on our road your springs and Fuller's, that I consider yours decidedly the best in every particular, and in this opinion I am sustained by all our officers. Fuller's spring has a tendency to split, and also to chafe or abrade by the constant friction on the cast iron plates or disc; and in my opinion is not near so elastic as yours.

Your springs, which have been in use on our road for 12 or 15 months past, and in constant use under both passenger and freight cars, are to all appearances as elastic, sound and good, as when first put in use.

We are now building eighty-five new cars, of which for fifty sets the springs have been ordered of you.

GEORGE A. ADAMS,

Master Carpenter,

Central Railroad and Banking Co. of Georgia.

Connecticut River Railroad Office,
Northampton, May 4, 1850.

E. CRANE, Esq.,

Dear Sir: It is now about two years since I first tried the experiment of using a set of Ray's India-rubber Springs upon one of our merchandise cars, and although the car has been in constant service since that time, I do not on examination find the slightest difference either in the thickness or elasticity of the material.

The same result has followed wherever we have applied them, either for wheel or draw springs on Engines, Tenders or Cars. At present we use no other; either in replacing old springs or building new cars—and I am perfectly satisfied that for economy, durability, safety, and ease of motion, that Ray's India-rubber is the best article for Springs which has been presented to the public.

Yours respectfully, **J. HUNT,**
Supt. Connecticut River Railroad.

EDWARD CRANE, Esq.,

Dear Sir: Having applied to cars of the Boston and Worcester Railroad Corporation, Ray's Vulcanized Rubber Springs (where they have been in use for some two years last past), I have had occasion to observe their operation, and am free to say in answer to your inquiries, that they retain their elasticity perfectly during all changes of atmospheric temperature; and are in my opinion a most valuable acquisition to Railroad Cars—are not liable to derangement, as is the case with steel springs; while at the same time it costs less to apply them. Respectfully yours,

D. N. PICKERING,
Supt. Motive Power, Bost. & Wor. Railroad.
Boston April 15th 1850.



**EMERSON'S
PATENT
CORRESPONDING
VENTILATORS,**

For Ships, Steamers, etc.,

Manufactured by



CHILSON, ALLEN, WALKER & CO.,
331 Broadway, New York

TO RAILROAD COMPANIES, CAR MANUFACTURERS, etc.

THE Undersigned hereby gives public notice, that the Commissioner of Patents, pursuant to his decision in relation thereto, on the 8th day of October, 1850, issued to him a Patent for the sole right to manufacture, and exclusive use of the **INDIA RUBBER CAR SPRING**, on account of priority of invention of said Spring.

F. M. RAY.
New York, Oct. 23, 1850.

RAILROAD CAR MANUFACTORY

TRACY & FALES.

GROVE WORKS, HARTFORD, CONN.

Passage, Freight and all descriptions of

RAILROAD CARS,

AS WELL AS

LOCOMOTIVE TENDERS,

Made to order promptly.

The above is the Largest Car Factory in the Union. In quality of Material, and in Workmanship, Beauty and Good Taste, as well as Strength and Durability, we are determined our work shall be unsurpassed.

JOHN R. TRACY. THOS. J. FALES.

Monument Foundry.

A. & W. DENMEAD & SON,
Corner of North and Monument Sts.,—Baltimore,

HAVING THEIR

IRON FOUNDRY AND MACHINE SHOP

In complete operation, are prepared to execute faithfully and promptly, orders for Locomotive or Stationary Steam Engines, Woolen, Cotton, Flour, Rice, Sugar Grist, or Saw Mills, Slide, Hand or Chuck Lathes, Machinery for cutting all kinds of Gearing, Hydraulic, Tobacco and other Presses, Car and Locomotive patent Ring Wheels, warranted, Bridge and Mill Castings of every description, Gas and Water Pipes of all sizes, warranted, Railroad Wheels with best fagotted axle, furnished and fitted up for use, complete. Being provided with Heavy Lathes for Boring and Turning Screws, Cylinders, etc., we can furnish them of any pitch, length or pattern. Old Machinery Renewed or Repaired—and Estimates for Work in any part of the United States furnished at short notice.
June 8, 1849.

RAILROAD CAR AND COACH TRIMMINGS.

Doremus & Nixon,

IMPORTERS AND FURNISHERS

HAVE FOR SALE

Plain Garnet Plush. Fig. Garnet Plush (Butterfly pat.
"Crimson" "Crimson" (Elegant.
"Scarlet" " " (Gen. Taylor.

BROCADELLES.

Crimson Silk Brocades. Gold and Maroon do.
Gold and Blue " Brown "
Silk and Wool " of every color.

MOQUETTES,

Of elegant designs and colors.

GERMAN CLOTH FOR CAR LININGS.

The most beautiful goods ever shown in this country, and the subscribers are the sole agents for the sale of them.

Oil cloths Enamelled with Gold. } These goods can be
" " Silver. } furnished in any
Do. Silver ground velvet printed. } dimensions req'd.

CURLED HAIR

Of every description and quality.

JNO. W. A. STRICKLAND, Agent.
New York, 1850. 1yl6

FOWLER M. RAY'S Patent India-rubber Railroad CAR SPRING.

New York and Erie Railroad Shops.
Piermont, March 26, 1850.

This will certify that from practical experience in the use of Fowler M. Ray's India rubber Car Springs, I believe them to be far superior to any others now in use.

I have never known them to be affected by any change of temperature, as other Rubber Springs have been affected on this road.

I am at the present time repairing a Passenger Car that Mr. Ray and myself mounted with his springs about two years and eight months since.

The springs are at the present time as perfect, to all appearances, as when first applied to the car.

Respectfully yours,

HORACE B. GARDNER,
Foreman of the Car Shops.

Supt. Office N.Y. & H. R.R., }
New York, March 8, 1850. }

This is to certify that we have used the Rubber Springs manufactured by Mr. F. M. Ray for the past twenty months, "both for Passenger and Freight Car Springs and Bumpers, and of different sizes," and have in every case given entire satisfaction, and I consider them the best spring now in use.

M. SLOAT, Supt.

Boston, March 5, 1850.

In answer to your enquiry about India-rubber Springs, I have to say that we have used them to a considerable extent on both freight and passenger cars, and also on several of our tenders; and I am very well satisfied that they answer all the purposes for which they are intended. I believe the India-rubber will soon supersede all other springs for cars and tenders.

Yours truly,

S. M. FELTON,
Supt. Fitchburg Railroad.

Office New Jersey Railroad Co., }
Jersey City, March 8, 1850. }

FOWLER M. RAY, Esq.,

Dear Sir: In answer to your enquiries respecting the operation of the Vulcanized Rubber Springs, purchased by our company from you some two years since, I reply that they are superior to any spring in use, (that I have either seen or heard of).

The improved form of your spring, consisting of a solid piece of vulcanized rubber with bands on the outside, is far superior to your first form, consisting of disks of rubber with metallic plates interposed.

The last named form was tried, if you recollect, at a much earlier period; and then was replaced by your last form.

I have no hesitation in saying that your springs have given entire satisfaction, and most cheerfully recommend them to railroad companies throughout the country for the following reasons:

- 1st. The cost is 30 per cent. less.
- 2d. Saving of weight on each car of 8 wheels from 700 to 800 lbs.
- 3d. Less care and attention is required, as they are not liable to get out of repair.
- 4th. A great saving is secured in the wear and tear of the cars and rails from their great elasticity.
- 5th. The freedom from noise.
- 6th. There is greater safety in case of accident, as they cannot be broken.
- 7th. The comfort of passengers is enhanced sufficiently to pay the expense, waiving all the other reasons that I have given.

Should this fail to satisfy any person enquiring, you are at liberty to refer to me, No. 150 Washington St., Jersey City. Yours respectfully,

T. L. SMITH, Supt.

New York, March 11, 1850.

I have used the Patent India-rubber Spring purchased of Mr. Ray, upon the cars of the New York and New Haven Railroad, and have found them efficient and economical; and when applied to the axles and draw springs, believe them to be quite equal to any in use. I have found a combination of these springs with a steel spring under the transom beam a very satisfactory arrangement, and am now using this plan in all new cars.

Yours respectfully,

ROBERT SCHUYLER.

February 25, 1850.

From practical observation of the use of the India-rubber Car Springs, manufactured and sold by your company, we are entirely satisfied in their application, and do not hesitate to recommend them as elastic, durable, requiring no repairs for years, and retaining their consistency during all extremes of weather. We have applied them for the past two years, and consider them superior for all railroad purposes.

Yours truly,

OSGOOD BRADLEY, Car Builder, Worcester.
T. & C. WASON, do. Springfield.
DEAN, PACKARD & MILLS, do. do.
DAVENPORT & BRIDGES, do. Cambridgeport.

Office of the New Jersey Railroad Co., }
Jersey City, March 7, 1850. }

This is to certify that we have had Mr. F. M. Ray's India-rubber Springs in constant use under our cars, and as Bumper Springs for upwards of two years, and they have in every way given perfect satisfaction.

The present form of spring we deem far superior to the form of Disk, having used both forms, although we have none of those made in Disks at present in use.

We take pleasure in recommending these springs to all railroad companies.

J. P. JACKSON, Vice Prest.
New Jersey Railroad and Trans. Co.

Roxbury, February 28, 1850.

In compliance with your request, I take great pleasure in stating the result of my experience in the use of "Ray's Patented Vulcanized India-rubber Car and Engine Springs." We have used them nearly two years, and never had one fail in any way. The cold weather does not affect them, as it has other rubber springs we have used.

With sixteen years' experience as superintendent of machinery on the Boston and Providence railroad, I take pleasure in saying that your springs are the best we ever used, or I ever saw used elsewhere. We have 20 cars rigged with them, of which I can say that the springs are as good now as when first applied. I put 24 lbs. of the rubber under the fore and end of one of our heaviest engines, taking off 250 lbs. of steel springs—it has been in use 18 months, and is in as good condition now as when first put under the engine.

Very respectfully yours,

GEO. S. GRIGGS,
Supt. of Machinery, Boston and Prov. R.R.

Fall River, February 2, 1850.

In answer to yours of the 20th ult. I would say that this company has for some 10 or 12 months past been using "Ray's India-rubber Springs." We have applied them to both passenger and freight cars with uniform success. They have invariably preserved their elasticity and consistency through all the extremes of weather; and we are now applying them whenever the steel spring fails. I am well satisfied that they are particularly adapted for railroad purposes.

Very respectfully yours,

GEO. HAVEN,
Supt. Fall River Railroad.

Jersey City, March 9, 1850.

This is to certify that the present form of Mr. F. M. Ray's India-rubber Car Spring I consider far superior to the form of Disk, having used both forms. I take pleasure in recommending these springs to all railroad companies.

DAVID H. BAKER,
Foreman of Car Shop of N.J. R.R. & Trans. Co.

Harlem R.R. Depot, }
New York, March 7, 1850. }

This is to certify that we have used Mr. F. M. Ray's India-rubber Springs for over eight months, and find them to be easy and durable, and recommend them to railroad companies as being superior to anything we have tried.

J. M. SMART,
Foreman at 42d St. Depot.

Old Colony Railroad Office,
Boston, March 6, 1850.

EDWARD CRANE, Esq.,

President New England Car Co.,

Dear Sir: In compliance with your request I would state that the Old Colony Railroad Company have had in use upon their road, India-rubber Springs furnished by your company, for more than eighteen months past, during which time they have been extensively used under Passenger and Freight Cars, Locomotive Tenders, and for Drawer and Buffering Springs, with the most perfect success. The elasticity and consistency of the Rubber has never been unfavorably affected by either extremes of heat or cold—and from the experience which we have had in the use of Rubber Springs, I think them well adapted for railroad purposes—and therefore we have for some months past used Rubber almost exclusively, in all places where springs are required.

Respectfully yours, etc.,

JAS. H. MOORE,
Supt. O. C. Road.

Troy, February 27, 1850.

We have been using your India-rubber Car Springs for nearly two years—and we take pleasure in saying that in our opinion the rubber has to a certain extent already, and may eventually entirely supersede all other Springs for Railroad Car purposes. We now use it entirely for Draw Springs and Bumpers, considering it better and lighter than steel.

During our two years' experience in the use of it, we have not known any to lose their elasticity, or fail in any way; and we cheerfully recommend the rubber for railroad car springs. Very respectfully,
EATON, GILBERT & CO.

Passenger Car Linings.

THE Advertiser continues to make to order the Enamelled Car Linings which have been so highly approved the last three years, and are now exclusively used by all the Northern Railroads. No pains are spared to get out new styles, and adapt them to the tastes of every consumer.

Orders addressed to **CHARLES STODDER, No. 75 Kilby street, Boston,** will have prompt attention.
March 23, 1850. 2m

India-rubber for Railroad Cos.

RUBBER SPRINGS—*Heaving and Buffer*—*Fowler's Patent*—Hose from 1 to 12 inches diameter. Suction Hose. Steam Packing—from 1-16 to 2 in. thick. Rubber and Gutta Percha Bands. These articles are all warranted to give satisfaction, made under Tyer & Helm's patent, issued January, 1849. No lead used in the composition. Will stand much higher heat than that called "Goodyear's," and is in all respects better than any in use. Proprietors of railroads do not be overcharged by pretenders.

HORACE H. DAY,

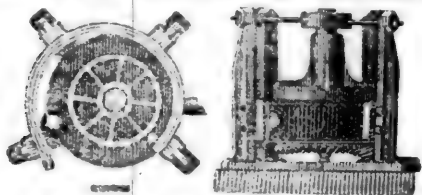
Warehouse 23 Courtlandt street,
New York, May 21, 1849.

Spikes, Spikes, Spikes.

Any person wishing a simple and effective Spike Machine, or a number of them, may be supplied by addressing **J. W. BLACK,**
March 6, 1850. Troy, N. Y.

MACHINERY.

Henry Burden's Patent Revolving Shingling Machine.



THE Subscriber having recently purchased the right of this machine for the United States, now offers to make transfers of the right to run said machine, or sell to those who may be desirous to purchase the right for one or more of the States.

This machine is now in successful operation in ten or twelve iron works in and about the vicinity of Pittsburgh, also at Phoenixville and Reading, Pa., Covington Iron Works, Md., Troy Rolling Mills, and Troy Iron and Nail Factory, Troy, N. Y., where it has given universal satisfaction.

Its advantages over the ordinary Forge Hammer are numerous: considerable saving in first cost; saving in power; the entire saving of shingler's, or hammerman's wages, as no attendance whatever is necessary, it being entirely self-acting; saving in time from the quantity of work done, as one machine is capable of working the iron from sixty puddling furnaces; saving of waste, as nothing but the scoria is thrown off, and that most effectually; saving of staffs, as none are used or required. The time required to furnish a bloom being only about six seconds, the scoria has no time to set, consequently is got rid of much easier than when allowed to congeal as under the hammer. The iron being discharged from the machine so hot, rolls better and is much easier on the rollers and machinery. The bars roll sounder, and are much better finished. The subscriber feels confident that persons who will examine for themselves the machinery in operation, will find it possesses more advantages than have been enumerated. For further particulars address the subscriber at Troy, N. Y. P. A. BURDEN.

Railroad Spikes and Wrought Iron Fastenings.

THE TROY IRON AND NAIL FACTORY, exclusive owner of all Henry Burden's Patented Machinery for making Spikes, have facilities for manufacturing large quantities upon short notice, and of a quality unsurpassed.

Wrought Iron Chairs, Clamps, Keys and Bolts for Railroad fastenings, also made to order. A full assortment of Ship and Boat Spikes always on hand.

All orders addressed to the Agent at the Factory will receive immediate attention.

P. A. BURDEN, Agent,
Troy Iron and Nail Factory, Troy, N. Y.

CHILLED RAILROAD WHEELS.—THE UNDERSIGNED are now prepared to manufacture their Improved Corrugated Car Wheels, or Wheels with any form of spokes or discs, by a new process which prevents all strain on the metal, such as is produced in all other chilled wheels, by the manner of casting and cooling. By this new method of manufacture, the hubs of all kinds of wheels may be made whole—that is, without dividing them into sections—thus rendering the expense of banding unnecessary; and the wheels subjected to this process will be much stronger than those of the same size and weight, when made in the ordinary way.

A. WHITNEY & SON,
Willow St., below 13th,
Philadelphia, Pa.

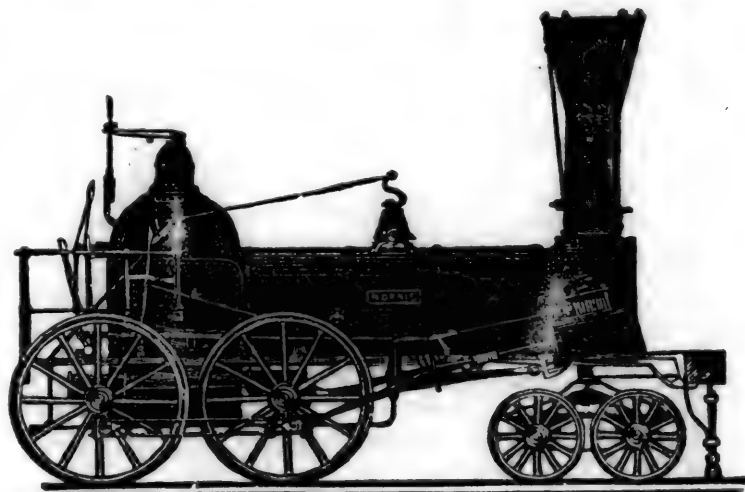
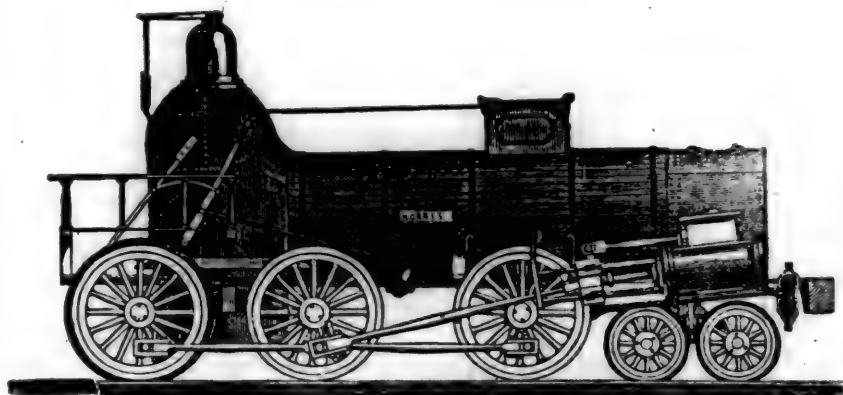
Brown's Old Established SCALE WARE HOUSE,
NO. 234 WATER ST. NEW YORK.

THE Subscriber, Practical Manufacturer of Scales of every description, respectfully asks the attention of Railroad Companies to his Improved Wrought Iron Railroad Track and Depot Scales which for strength, durability, accuracy, convenience in weighing, and beauty of workmanship, are not surpassed by any others in this country.

He is aware that this is rather a bold assertion for him to make, yet he can say with confidence that they have but to be tried to give them precedence over all others.

Bank Scales made to order, and all Scales of his make Warranted in every particular.

References given if required

NORRIS' LOCOMOTIVE WORKS.
BUSHHILL, SCHUYLKILL SIXTH-ST., PHILADELPHIA,

THE UNDERSIGNED Manufacture to order Locomotive Steam Engines of any plan or size. Their shops being enlarged, and their arrangements considerably extended to facilitate the speedy execution of work in this branch, they can offer to Railway Companies unusual advantages for prompt delivery of Machinery of superior workmanship and finish.

Connected with the Locomotive business, they are also prepared to furnish, at short notice, Chilled Wheels for Cars of superior quality.

Wrought Iron Tyres made of any required size—the exact diameter of the Wheel Centre, being given, the Tyres are made to fit on same without the necessity of turning out inside.

Iron and Brass castings, Axles, etc., fitted up complete with Trucks or otherwise.

NORRIS, BROTHERS

PATENT MACHINE MADE HORSE-SHOES.



The Troy Iron and Nail Factory have all ways on hand a general assortment of Horse Shoes, made from Refined American Iron.

Four sizes being made, it will be well for those ordering to remember that the size of the shoe increases as the numbers—No. 1 being the smallest.

P. A. BURDEN, Agent,
Troy Iron and Nail Factory, Troy, N. Y.

Etna Safety Fuse.

THIS superior article for igniting the charge in wet or dry blasting, made with DUPONT'S best powder, is kept for sale at the office and depot of

REYNOLDS & BROTHER,
Sole Manufacturers,
No. 85 Liberty St.
NEW YORK.

And in the principal cities and towns in the U. States. The Premium of the AMERICAN INSTITUTE was awarded to the Etna Safety Fuse at the late Fair held in this city.

November 3, 1849.

1y

COLUMBUS, OHIO,

Railroad Car Manufactory.
RIDGWAYS & KIMBALL,

HAVE established at this central point, the manufacture of Passenger, Freight, Gravel and Hand Cars for Railroads, and assure all Western Railroad Companies that it will be their constant aim to procure the best materials and workmen, and to turn out the best kind of work at fair prices. Specimens may be seen on the Columbus and Xenia Railroad. The patronage of Railroad Companies is respectfully solicited.

1y8

FOR SALE.

THREE LOCOMOTIVES, Manufactured by M. W. Baldwin, of 10 tons weight, all in complete repair, and now running on the Columbia and Philadelphia Railroad.

For particulars apply to A. L. Roumfort, Supt. of said road, either at Philadelphia, or Parkersburg, Chester county.

A. L. ROUMFORT,

Supt. Motive Power Col. & Philad. R.R.

AMERICAN RAILROAD JOURNAL.

STEAM NAVIGATION, COMMERCE, MINING, MANUFACTURES.

HENRY V. POOR, Editor.

ESTABLISHED 1831.

PUBLISHED WEEKLY, AT No. 136 NASSAU ST., NEW YORK, AT FIVE DOLLARS PER ANNUM IN ADVANCE.
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ASSISTANT EDITORS,
J. T. HODGE, *For Mining and Metallurgy.*
GEN. CHAS. T. JAMES, *For Manufactures and the
Mechanic Arts.*

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American Railroad Journal.

PUBLISHED BY J. H. SCHULTZ & Co., 136 NASSAU ST.

Saturday, November 30, 1850.

Correspondence of the Journal.

WASHINGTON, November 27, 1850.

More than ordinary interest is felt as to the contents of the forthcoming Message of the President, and the Annual Reports from the Secretaries. I learn that the Report of the Secretary of the Treasury will show that a system of frauds upon the revenue has been extensively practiced by an undervaluation of the goods imported, and that a more stringent law will be recommended to protect the honest importer and the government.

The imports during the year ending June 30th, 1850, have reached \$186,000,000 as the declared value, but the actual value has been equal to the sum of \$200,000,000.

The exports have reached but \$145,000,000, showing an excess of imports over exports of \$41,000,000.

000 according to the Custom House returns, but in fact an excess in value of over \$50,000,000.

The amount of gold received from California and deposited at the U. S. Mint, to August 31st, 1850, was \$24,508,454. Since August 31st, the average has been equal to \$2,000,000 per month. This will make the sum of \$32,500,000 as the probable receipts of gold from California.

One of the most interesting items of statistics is the annual revenue derived to the Postoffice Department from the ocean steam ships. The following tables, compiled from official sources, will show the extent to which our foreign mail service has been carried on through the agency of ocean steam navigation. These tables will be fruitful in the way of suggestions hereafter.

Statement of Postages by the Cunard Line, from February 21st, 1849, to September 30th, 1850, (under the Postal Treaty).

From Feb. 21, 1849, to Sept. 30, 1850—
Mails received.....\$488,611 94
" sent.....438,453 55
927,065 49

Or as follows:
From Feb. 21, 1849, to June 30, 1849—
Mails received.....\$88,491 82
" sent.....79,088 06
167,579 88

From July 1, 1849, to June 30, 1850—
Mails received.....\$317,014 70
" sent.....290,014 93
607,029 63

From July 1, 1850, to Sept. 30, 1850—
Mails received.....\$83,105 42
" sent.....69,350 56
152,455 98

\$927,065 49

Postages by the Collins' Line of Steamers [under the Postal Treaty with Great Britain] from April 27th, 1850, to Sept. 30th, 1850.

From April 27, 1850, to Sept. 30, 1850—
Mails received.....\$7,673 62
" sent.....25,789 54
33,468 16

Or as follows:
From April 27, to June 30, 1850—
Mails received.....\$500 67
" sent.....9,890 74
10,391 41

From July 1, to Sept. 30, 1850—
Mails received.....\$7,177 95
" sent.....15,898 93
23,076 75

\$33,468 16

Statement of Postages on the New York and Charges Line, from December 1, 1848, to November 1, 1850.

From Dec. 1, 1848, to Sept. 30, 1850—
Mails received.....\$178,699 67
" sent.....223,898 96
402,598 63

Or as follows:
From Dec. 1, 1848, to June 30, 1849—
Mails received.....\$6,737 89
" sent.....16,907 14
23,635 03

From July 1, 1849, to June 30, 1850—
Mails received.....\$109,263 26
" sent.....140,005 64
249,268 90

From July 1, to Sept. 30, 1850—
Mails received.....\$54,630 57
" sent.....75,056 13
129,686 70

\$402,598 63

Charleston and Havana Line, from October 18th, 1848, to September 30th, 1850—one steamer only making trips twice a month.

From Oct. 18, 1848, to Sept. 30, 1850—
Mails received.....\$13,598 79
" sent.....8,807 58
22,406 37

Or as follows:
From Oct. 18, 1848, to June 30, 1849—
Mails received.....\$4,744 99
" sent.....3,529 48
8,274 47

From July 1, 1849, to June 30, 1850—
Mails received.....\$8,049 22
" sent.....4,802 08
12,850 30

From July 1, to Sept. 30, 1850—
Mails received.....\$504 58
" sent.....476 02
1,280 60

\$22,406 37

During August and September, [the hurricane months] a schooner is employed instead of the steamer.

Postages on the New York and Bremen Line from June 1st, 1847, to September 30th, 1850.

From June 1, 1847, to Sept. 30, 1850—
Mails received.....\$82,160 00
" sent.....58,707 12
140,867 12

Cunard steamers—arrive and depart once a week;
gross amount of postage per month.....\$50,000
Collins' line, " ".....11,000
New York and Bremen line, " ".....13,000
" Havre " ".....5,000

\$79,000

Internal Improvements of the State of New York.

A SKETCH OF THE RISE, PROGRESS, AND PRESENT CONDITION OF INTERNAL IMPROVEMENTS IN THE STATE OF NEW YORK.

Continued from page 736.

If those who are engaged in transporting a million and a quarter of tons to tide water on the Erie Canal, were required to elevate this vast amount of tonnage to a perpendicular height of 2,500 feet, and again to let it down the same number of feet, this ascent and descent would be regarded as an insurmountable obstacle to the transmission of commodities, and the trade would inevitably pass into other channels where the obstacles were less formidable. By means of lift locks on canals, planes with stationary engines, and heavy grades with locomotive engines, on railroads, the science of the engineer has rendered it possible to overcome a rise and fall even of 5,000 feet. But to effect this there must be an outlay in the construction of the machinery, and an application of power for raising and letting down the tonnage, corresponding with the elevation to be overcome.

A lift lock, acting by the power of water, is probably the most economical mode of raising and lowering the heavy products of the forest, the mines and of agriculture. By the agency of a lock of ten feet lift, eighty tons may be elevated ten feet in ten minutes, in the boats used on the present canal; and this can be continued, on an average, for the whole season of navigation.* The cost of the locks on the old Erie Canal was \$1,000 per foot lift, or \$10,000 for a lock of ten feet lift. Five hundred and forty-one locks, the required number to overcome the rise and fall from Cleveland to Philadelphia, would amount to \$5,410,000. The annual expense for tending, repairing and furnishing oil for the locks on the Erie Canal before they were doubled, was about \$50,000, for 80 single locks. At this rate, 541 locks would cost annually \$338,000. Add to this the interest at 6 per cent on the cost of the locks, \$324,000, and it makes the total annual expense of the structures to overcome a rise and fall of 5,410 feet, equal to \$662,000. Take the rise and fall on the Erie Canal as requiring 71 single locks at \$10,000 each, and it gives a capital of \$710,000, the interest of which is \$42,600; add this to the cost of tending, repairs, &c., \$50,000, and it makes the annual expenditure \$92,600. The difference between the ascents and descents on the Pennsylvania and New York lines, when reduced to dollars and cents, is equivalent to an annual expenditure of \$569,400, which is about 5 per cent on the cost of the main line of the public works of Pennsylvania from Philadelphia to Pittsburgh. This of itself is sufficient to account for the success which has attended the efforts of New York, in the competition with Pennsylvania, for the trade of the western lakes. But in addition to the annual cost of overcoming the rise and fall, the transporters of property are subjected to delay, expense, and inconvenience, proportioned to the obstacles to be overcome. New York is in all respects equal, and in some particulars a more desirable shipping port than Philadelphia.

In a comparison between New Orleans and New York, from Cincinnati, although there is a difference of 500 miles in favor of New York, yet on the untaxed waters of the Ohio and Mississippi, a barrel of flour is carried 1,500 miles in a flat boat for fifty cents, being less than the toll charged by the states of Ohio and New York on 613 miles of canals, besides the sum required to remunerate the person for transporting the barrel of flour 1,010 miles, and the inconvenience and delay occasioned by 1,339 feet of lockage. The charge of transit on the Ohio river, by steamboats, is about half cent per ton per mile.

* The number of lockages at Alexander's Lock, a few miles west of Schenectady, in the 219 days of navigation in 1849, was 36,918, averaging one boat for 8.66 minutes for the whole period, being 168½ boats for each 24 hours. Canal Commissioner's Report, 1850, p. 100. In 1847 the lockages averaged 205 for each 24 hours, being one in each seven minutes, of the whole season. Single locks, in 1847, by being double manned, passed a boat every five minutes for twenty-four hours in succession.

There are causes, however, which operate against the route to New Orleans. These are set forth by Mr. Cabell, in an able defence of the canal policy of the James river and Kanawha Canal Company, and published in 1846, as follows:—"1. The danger of the navigation of the Mississippi on account of snags, and the higher rates of insurance in consequence of these hazards. 2. The storms and hurricanes in the Gulf of Mexico, incident to a West India climate. 3. The climate of New Orleans, and injury to articles liable to damage from heat. Persons connected with five mercantile houses of established character in Richmond, engaged in the trade to which they refer, certify that the articles of tobacco, flour, pork, bacon, lard, butter, cheese, &c., would pay two cents per ton per mile from the Ohio river to Richmond, and net the grower more than if taken to New Orleans free of charge, for the following reasons:—"These articles are all materially injured by passing through a warm and humid climate; at New Orleans they have to pay exorbitant rates of drayage, storage, fire insurance and commission, and when shipped from thence to other markets are subject to a rate of freight at times 50 per cent higher than from James river." Gen. Steenbergen, who resides on the borders of the Ohio, says:—"Every avenue from the Ohio to the eastern cities at all practicable is used and sought now in preference to the New Orleans route. It will always be the case. The climate and dangers of the one, against the certainty and even high prices of the other, will make the inland passage the favorite one."

Heavy expenditures have been made by the British government for improving the channels of communication between the great lakes and the ocean, through the St. Lawrence river in canalling by the falls. The interior route, which is completed only to Lake Ontario, might serve an important purpose in case of war, by keeping up intercourse with the upper lakes, independent of the navigation of the St. Lawrence along the borders of the United States. But as a channel for the accommodation of vessels in a peaceful contest for the trade of the lakes, it is entirely superseded by the superior navigation afforded on the direct route down the St. Lawrence.

The interior route leaves the St. Lawrence at the mouth of the Ottawa river, 61½ miles above Montreal, and follows the Ottawa 58½ miles, where the connection is made with the Rideau Canal. The whole distance, by this route, from Montreal to Kingston, is 248 miles, with 63 locks and 564½ feet of lockage. From Kingston by Bay of Quinte to the mouth of the river Trent is 70 miles. From this point, by way of Rice Lake and Otonabex river, to the summit of Balsam Lake, 166½ miles, the rise is 584 feet, requiring 61 locks. In descending by Talbot river to Lake Simcoe, 16½ miles, 12 locks are required for 108.4 feet of lockage. From Lake Simcoe by the river Severn to Gloster Bay, Lake Huron, 52 miles, the descent is 110 feet, requiring 10 locks. From Montreal to Gloster Bay, Lake Huron, the total distance by this route is 553½ miles, with 1,367 feet rise and fall, requiring 146 locks.

The direct route by the improvement of the St. Lawrence is as follows:—From Montreal to Kingston, 176 miles, 204.3 feet of lockage and 23 locks. From Kingston to Port Dalhousie by Lake Ontario 163 miles. Ascending to Lake Erie by the Welland Canal, 329 feet of lockage and 26 locks, in a distance of 28 miles. From Port Colbourne, Lake Erie to river Detroit 218 miles. Ascending river Detroit, Lake St. Clair, and river St. Clair to Lake Huron, 85 miles. Total, 670 miles, 533.3 feet of lockage, and 49 locks. This route saves 97 locks and 833 feet, nine inches of rise and fall, compared with the inland route. The English engineers give the elevations of the lakes above the level of the sea at the termination of tide water at Three Rivers, 90 miles below Montreal, as follows:—Lake Huron, 594 feet; Lake Erie, 564 feet; Lake Ontario, 234 feet.

The distance from Toledo to New York is 760 miles, and to Montreal 585 miles. To the ocean from Montreal is 800 miles, and from New York only 20. The totals are 780 by New York, against 1,385 to the ocean by way of Montreal and Quebec. The New York route has 640 feet of lockage, and

71 locks, while that by Montreal has 533.3 feet of lockage and 49 locks. The difference in the lockage is not so material as the fact that by the recent improvements of the Welland Canal, and on the direct route down the St. Lawrence, a vessel of 500 tons burden can take in a cargo at Toledo, and so far as physical obstacles are concerned, can pass down the St. Lawrence and into the Atlantic without breaking bulk. When the navigation of the St. Lawrence is made free, and a vessel can clear from Toledo or Chicago to a port in Europe, this route will have all the advantages of the Mississippi route from Cincinnati in saving the cost and trouble of transshipment. By the present regulations a cargo must go to sea from Montreal in a British vessel.

The outlet of the St. Lawrence river into the ocean is not less than 1,000 miles to the northeast of Lake Ontario, about 700 miles of the line consisting of the river itself, and 300 miles of the Gulf of the St. Lawrence, into which it falls. This line of navigation has been accurately described by Mr. Stevenson, who visited and carefully examined it in 1838, and made a report to the British government in reference to the enlarged canals around the rapids of the St. Lawrence. He describes the navigation of the Gulf as follows:—

"The navigation of the Gulf of St. Lawrence, through which the river discharges itself into the Atlantic, is very hazardous. In addition to the dangers arising from the masses of ice which are constantly to be met with floating on its surface, for nearly one-half of the year, it is subject to dense and impenetrable fogs, and its rocky shores and desolate islands afford neither comfort nor shelter to the shipwrecked mariner. One of the most desolate and dangerous of the islands in the Gulf is Anticosti, which lies exactly opposite the mouth of the St. Lawrence, and is surrounded by reefs of rocks and shoal water. Two light houses have been erected on it, and also four houses of shelter, containing large stores of provisions, for the use of those who have the misfortune to be shipwrecked on its inhospitable shores."

New York, as stated in Mr. Clinton's memorial, "is placed in a happy medium between the insubstantial heat of the Mississippi, and the severe cold of the St. Lawrence; and has pre-eminent advantages as to the goodness and extensiveness of her market." Will the commerce of the lakes turn away from their favorite shipping port, and the safe channel to it by the Erie Canal and the Hudson, and expose itself to the hazardous navigation of the Gulf of the St. Lawrence?

This may take place to some extent. At the same time the attractions of the New York market may draw trade even from Lower Canada through Lake Champlain and the Northern Canal. The valleys of the Hudson, of Lake Champlain, and of the St. Lawrence, are nearly on the same level.—Lake Champlain is only 87 feet above the tide of the Hudson; and from Albany to Whitehall, the rise and fall is only 204 feet in a distance of 73 miles. It is stated by the Canal Commissioners in their report of 1817, that three locks at Fort Edward, [from whence the Hudson was originally used as a part of the canal,] of 7.779 feet lift each, would attain the summit level between the river and lake. Gordon, in his Gazetteer of New York, says:—"The most remarkable feature of the Hudson and Champlain valley, is its great and uniform depth. The highest part of its bottom, between the river and the lake is only 147 feet above the tide of the Hudson, and 54 above the surface of the lake. Hence, an obstruction in the channel of the Hudson, at the entrance of the Highlands near Newburgh, of only 150 feet in height, would turn the current of the river northward, and cause it to descend by Lake Champlain and its outlet to the Gulf of the St. Lawrence."

The formation of the country, for uniting the Hudson with Lake Champlain, was as favorable as that for connecting it with the great western lakes; and as soon as the Northern Canal was completed, the lumber and other articles which formerly were transported from the shores of Lake Champlain to Montreal and Quebec, took the route of the canal to the Hudson.

The Northern railroad, which is intended to tap the western trade at Ogdensburg, on the St. Lawrence, is brought on an easy grade, and enters the

Champlain valley about one hundred miles north of Whitehall, at Rouse's Point, where the company desires to bridge the lake, and connect the road with those leading to Boston, through Vermont.—Will this trade go over the mountains to Boston, or pass through the Champlain and Hudson valley to New York? The engineer who surveyed the route for the Northern railroad, states, that "the amount of elevation to be overcome from Burlington to Boston, exceeds, by 3,000 feet, that to be surmounted by a train in passing from Burlington to Albany. But adopting this excess at 2,500 feet only, and it would, so far as the transportation of freight is concerned, be equivalent to an additional distance, on a level railway, of 125 miles; which, being added to the 86 miles excess in the measured distance, gives an excess of 211 miles in the equated distance of Boston from Burlington over that of Albany to Burlington. And it cannot be doubted, that with this difference in favor of Albany, and 67 miles in favor of New York, when compared to the distance to Boston, a large portion of the business which passes the bridge at Rouse's Point, must take the route to the Hudson river valley."

During the season of navigation the present accommodations for trade and travel are of the best character, and when the railroad connections are completed, the grades of the respective lines will decide in favor of the route through the Champlain and Hudson valley, at all seasons.—*Merchants' Magazine*.

The French Navy.

The following was the state of the French navy according to the official returns of the first of June last:—24 ships of the line afloat and 21 in the dockyard. These latter represent the force of 16 ships of the line at 22-24 of advancement, and 4 at 14-24; 38 frigates afloat and 18 in the dockyard, representing 10 at 22-24, and 6 at 14-24; 36 corvettes, 30 afloat and 6 in the dockyard; 51 brigs, 44 afloat and 6 in the dockyard; 38 transports, 15 of 800 tons, 12 of 500 tons, and 11 under 500 tons; 50 light vessels, of various tonnage; in all, 277. In mixed vessels there are—1 ship of the line of 100 guns, and 2 of 90 in the dockyard; 1 third-rate frigate afloat, 2 corvettes, used as advice boats, and 1 small vessel, the *Pingouin*, of 30 horse power. The steam navy is composed of 1 vessel of 960 horse power, and 21 frigates; 8 corvettes of the first-class, 2 afloat and 6 in the dockyard; 21 corvettes of the second class, 20 being afloat and 1 in the dockyard; 34 advice boats of the first class afloat; 23 advice boats of the second class, 19 afloat and 4 in the dockyard; 2 iron boats of 30 horse power and 1 of 20 horse power, appropriated to the local service of Senegal—in all, 111 vessels. It appears, from an official return, that the cost of building and fitting out a French ship of the line, of three decks, and carrying from 110 to 120 guns, is 3,000,000*f*.; one of 100 guns, 2,800,000*f*.; and one of 90 guns, 2,500,000*f*.

Institution of Mechanical Engineers.

"On the India-rubber Buffer," by Mr. De Berge. In reference to the observation that the sustaining power of the India-rubber buffers is too great, and that in the event of a collision the train might collapse before this was fully developed—the writer would observe, that the most effective buffers, in the event of a collision, will be those which will oppose the greatest amount of resistance moving through the greatest space, provided their maximum resisting force should not exceed the pressure that could be sustained by the under frames of the waggons without injury. Now the maximum sustaining power of a pair of these India-rubber buffers does not exceed 30 tons, and as there are several thousand sets of them in use, many of which have at times been driven quite home without the waggons being collapsed, it follows that their resisting power does not exceed a useful limit, and that they must consequently be much more efficient in the event of a collision, than any other buffers having the same stroke and only one-third of the resisting power.

But it must be borne in mind that buffers are not solely required for cases of collision, they are more generally serviceable to break the slighter concussions in stopping and starting trains and in sidings and warehouses; and in order that they should be

appropriated to this service, their resisting force must be comparatively very small at the commencement of the stroke, no spring yet produced combines these properties so perfectly as the vulcanised India-rubber; indeed, it is so easily acted upon at the commencement of the stroke, that it has been found advisable to compress the four rings in each buffer to the extent of one inch before the stroke commences.

If the immense sustaining power of these buffers were objectionable, it could be reduced to any required amount, simply by decreasing the diameter and thickness of the rings, which would also lessen the cost—but, in the opinion of the writer, that would be destroying one of the most valuable properties of these buffers.

A comparison has been made between the relative proportions of effective resistance of a pair of buffers of 12 inches stroke with the ordinary laminated spring, and a pair of the India-rubber wagon buffers; but, in the writer's opinion, the calculations are incorrect. It has been assumed that the India-rubber buffers have only 1½ inch stroke with a final resistance of three tons: say 3 tons × 1½ inches = 4½ effective resistance of a pair of India-rubber buffers. Then 12 inches is given as the stroke of the laminated spring with 2½ tons, which would make 2½ tons × 12 inches = 33 effective resistance, the proportion being 4½ to 33, or 1 to 7½.

But as regards the India-rubber buffers, the length of stroke is exactly 3 inches, and the maximum resistance 20 tons for a pair; and as this large amount of resistance is mainly accumulated towards the end of the stroke, as will be seen from a statement of experiments annexed, it would not be correct to take the half of that as the average resisting power; but it is presumed that it will be keeping within the limits to take only one-quarter of the maximum resistance; say 5 tons, as the average resisting power for a pair of buffers, thus: 5 tons × 3 inches = 15 effective resistance.

With regard to the laminated spring, 2½ tons is given as the resisting power of the spring for the pair of buffers with 12 inches of action; but this 2½ tons is the maximum resistance of the spring deflected to a straight line, and being a steel spring, and its resistance not increasing in the same compound ratio as the India-rubber, nearly half its maximum power should be allowed as the average resistance throughout the stroke; say 1½ ton × 12 inches = 16½ effective resistance; thus it appears that the proportionate effective resisting force between a pair of the India-rubber 3 inches stroke wagon buffers, and a pair of 12 inches stroke ordinary laminated spring buffers, is as 15 to 16½, instead of being as 1 to 7½.

It may be here observed that the India-rubber buffers are not limited to 3 inches stroke; some are made 4½ inches, and some with 6 inches stroke for passenger carriages, and their resisting power is proportionately increased, but this incurs additional expense, which is a matter of no small consideration in the present times, and it is found from lengthened practice that the 3 inch stroke buffers are quite sufficient for all classes of goods waggons, and even for cattle trucks, luggage vans, &c. The size of the India-rubber rings in these 3 inches stroke buffers is 5½ inches diameter and 1½ inch thick.

With respect to the durability of the vulcanised India-rubber, a reference has been made to elastic bands for papers that have become completely rotten; but it will be sufficient to state the fact that a great quantity of these bands have been made that were never "vulcanised" at all, and were manufactured under an independent patent for "converting," but they were sold by the same parties, and the public did not know any difference. The India-rubber rings used in the buffers are all vulcanised, and the writer has examined many of them that have been at work for several years, and he has not yet met with a single instance of a bad one.

It has been objected to the external cylinder buffers, that the piston or plunger is guided through too short a space, which makes it more liable to break the cylinder in the event of an oblique blow; but it should be observed that this defect is obvious in the India-rubber buffer, where the length of the bearing extends from the mouth of the cylinder

to the end of the boss on the base plate, the spindle being fitted so as to form a solid body with the plunger. The India-rubber buffer is superior, in the writer's opinion, to the other external buffers, in efficiency and durability, whilst equally compact and economical, as the resistance begins very gradually at the first part of the stroke, and increases to a great power at the latter part, without coming to a dead stop at a moderate pressure, as in the other buffers; the pressure being spread uniformly over the whole surface of the base plate, which is better adapted to preserve the wagon frame from injury, and the elastic material is not liable to break as steel, whether in the form of a spiral or otherwise.

The following table shows the actual compression of one of these India-rubber wagon buffers of 3-inch stroke, with each increase of pressure from ½ ton up to 10 tons, tried with great accuracy in a machine made for the purpose:—

Pressure in tons.	Amount of action in inches.
½	1.125
1	1.625
1½	1.963
2	1.344
2½	1.694
3	1.750
4	1.906
5	2.031
6	2.219
7	2.375
8	2.563
9	2.750
10	2.938
	2.969
	3.000

—*Practical Mech. Jour.*

LARGE DAMAGES FOR A FORCIBLE EJECTMENT FROM A RAILWAY CAR.

In the case of *Thomas Keyes vs. W. B. Lawton* and others, for assault and battery, tried before the Supreme Court of Rhode Island, the Jury returned a verdict for the plaintiff for \$10,000. The Providence Journal says that the action was brought for an assault committed upon the plaintiff while a passenger in the Stonington cars by the defendants, who were officers in the cars, and for a forcible ejectment from the cars. We understand that the assault for which this suit was brought commenced by a controversy between the plaintiff and brakeman about the smoky condition of the cars, and ended by the former being thrown from the train, and seriously injured.

Vermont Legislature.

The Middlebury Register contains a brief review of the proceedings of the Vermont Legislature at its last session, from which we extract the following:

"In the department of 'roads,' the great questions in agitation this year were: The bridging of Lake Champlain at Rouse's Point, and the application of the Rutland and Whitehall railroad for right to extend their road from Castleton to Rutland. In the former case, after so amending the original bill as to give the Rutland and Burlington road equal privileges with the Vermont and Canada (authorising the Rutland and Burlington to extend their road to Swanton via St. Albans Bay for that purpose)—the grant was made almost unanimously—only three in the Senate, Messrs. Chandler, Currier and Parker voting against it. In the House there were but eleven opposed. The grant asked by the Rutland and Whitehall road was refused by a decisive majority. Several plank road companies were incorporated—among the number one from Bristol to Vergennes, and one from Hinesburgh to Burlington.

STATISTICS OF COAL.

The following tables comprise many particulars of interest in relation to coal. They are derived mainly from the valuable work on this subject by Richard C. Taylor, Esq.* The very general substitution of coal for wood as fuel, and its employment in the manufacture of iron and in the production of steam and gas, have, of late years, given an amazing impulse to the trade in this article. Thirty years ago, the coal trade in this country was limited to 365 tons of anthracite, brought from the Lehigh mines to Philadelphia; now, the annual production of anthracite greatly exceeds 3,000,000 of tons. This rapid increase is not confined to the United States. In the twenty years from 1825 to 1845, the exports of coal from Great Britain increased 713 per cent.; the production of coal in France 181 per cent., in Belgium, 111 per cent., in Prussia 124 per cent.

Indeed, so great and various have the uses of coal become, that in connection with iron it must now be considered one of the most important elements of a nation's commercial and manufacturing prosperity. It is interesting, therefore, to ascertain and compare the extent and quality of the coal deposits of various countries. Unfortunately, there exist innumerable deficiencies and discrepancies in the statistical materials at command. In some countries, however, as in France and Belgium, measures are taken to register every important particular in mining operations. It is much to be regretted, that the same fullness of detail is unattainable in Great Britain and in this country. This work of Mr. Taylor, by exhibiting the importance of these details, will, it is hoped, do much towards securing so desirable a result.

In the distribution of coal the United States are highly favored. Exclusive of Texas, New Mexico, California and Oregon, all of which are known to contain coal, the area of coal formations in the United States is estimated by Mr. Taylor to be 133,132 square miles, while the total area of these formations in Great Britain, Ireland and the British Provinces of Nova Scotia, New Brunswick, Cape Breton and Newfoundland, is, according to the same authority, less than 30,000 square miles. Nearly the whole of this vast area is occupied by bituminous coal. The total area of the anthracite region of Pennsylvania is estimated at less than 400 square miles. Yet more tons of fuel are now annually produced from this small area, than from the almost boundless fields of bituminous coal scattered over twelve States. The railroads and canals built to develop the wealth of this region, had cost in 1847 about \$40,000,000. Anthracite seems, indeed, to have superseded bituminous coal on nearly the whole of our Atlantic seaboard. The freedom from smoke of anthracite is alone sufficient to account for the preference given to it for domestic purposes. In steam navigation it admits of much closer stowage, and is not liable to spontaneous combustion, as is the case with bituminous coal. In war steamers there is additional advantage, that no smoke betrays the motions of steamers burning anthracite, whereas steamers burning fat, bituminous coal can be "tracked" seventy miles, before their hulls become visible, by the black smoke trailing along the horizon.† The preference given to anthracite may be illustrated by a comparison of the importations of coal into Boston, in the years 1840 and 1847, which stand thus:

	1840.	1847.
Pennsylvania anthracite,	73,847	258,093 tons.
American bituminous coal,	3,299	4,554 "
Foreign " "	49,997	65,203 "

Thus, while in 1840 the excess of anthracite was but 20,551 tons, in 1847 it was 188,336 tons.†

In regard to the red ash and white ash varieties of anthracite mentioned in Table VIII, "it seems established," says Mr. Taylor, "that, for closed furnaces for warming houses, the white ash variety, being the most compact, dense and slow burning, is more durable" than the softer red ash coal, and consequently preferable. "In open grates, he adds,

* Statistics of Coal, by Richard C. Taylor, Philadelphia, 1848, 8vo., pp. 754.

† Taylor, p. 364.

‡ Taylor, p. 16.

for warming apartments, the latter is decidedly preferred."

"A very important and interesting experiment was recently made for the purpose of testing the comparative value of the red and the white ash coals for domestic purposes. Two rooms of nearly the same size, and having the same temperature, were selected to ascertain how many pounds of each kind would be required to heat them to a temperature of 65 degrees, during a period of 15 hours, when the temperature out of doors at 9 A. M. was at ten degrees below the freezing point. Two days were occupied in the trial, so that the red and the white ash coal might be used in alternate rooms. Fires were made at 9 A. M., and continued until 12 P. M. Two thermometers (one in each room) were suspended at the greatest distance from the grates, and the temperature was carefully registered every hour. The result was as follows:

"Thirty-one pounds each day of the Schuylkill red ash coal gave a mean temperature of 64 deg.; and thirty-seven pounds each day of the white ash, taken from a vein of high repute in the Lehigh region, gave a mean temperature of 63 deg.; making 2,000 pounds of the red ash to be equal to 2,387 pounds of the white; or red ash coal at \$5 50 per ton to be equal to white ash at \$4 61."

Table I. gives a comparative view of the areas of coal lands, and the production in 1845 of the six principal producing countries. As to the area of coal formations in France, it is to be remarked, that the area of the "concessions," or grants made for working, is all that is given. The amount of coal produced includes 152,900 tons of lignite or brown coal in France, and over 700,000 tons in Prussia. The fourth column gives the relative parts in 1000 produced by each country.

TABLE I.†

Countries.	Sq. miles of coal formations.	Tons of fuel produced in 1845.	Relative parts of 1,000.	Official estimated value at places of production. American dollars.	Pounds sterling.
Great Britain.....	11,859	31,500,000	642	45,738,000	9,450,000
Belgium.....	518	4,960,077	101	7,689,900	1,660,000
United States.....	133,132	4,400,000	89	6,650,000	1,373,963
France.....	1,719	4,141,617	84	7,663,000	1,603,106
Prussian States..	"not defined."	3,500,000	70	4,122,945	856,370
Austrian States..	" "	653,340	14	800,000	165,290
Total.....	49,161,034	1000	72	663,845	15,108,729

Tennessee.

Memphis and Charleston Railroad.—The President of this road, Hon. James C. Jones, has called a meeting at Memphis, on the 1st. proximo. The route of this road will then be determined.

In speaking of the road, the Memphis Eagle says,

The prospect of the construction of the road in a few years, is eminently favorable. One million seven hundred thousand dollars have been subscribed to the stock already. A like amount, we feel certain, never yet was subscribed in the same time to a public project, under similar circumstances. The question of building a railroad, as a

* Taylor, Introduction, p. 1x.

† Ibid, Introduction, p. xx.

practical question, was a new one in the section of country in which it was proposed, and yet from this section every dollar of subscription has thus far come. "No appeal has yet been made for aid to Charleston or New Orleans, large and wealthy points deeply interested in the work, or to the capitalists of northern Georgia, to whose system of internal improvements the completion of this road is absolutely essential, or to foreign capitalists in Baltimore, Philadelphia and New York, who will doubtless recognise in the projected road a fine opportunity for profitable investment of their surplus means, and a project ensuring greater convenience and more frequent intercommunication in their trade with the west.

It will not be long before they will be called upon and solicited to properly note the value of the projected road as an investment and an aid to trade and travel. We understand that it is the intention of Governor Jones, immediately after the meeting of the board of directors at this place, on the 1st proximo, to proceed first to New Orleans and then to Charleston in the prosecution of his zealous labors, which have thus far so signally advanced the prospects of the road, which, in fact, more than anything else, have placed it at a point from which the view of its completion is certain. We have no doubt but that he will gather in New Orleans and Charleston a harvest of subscriptions, abundant even in the most sanguine expectations of the warmest friends of the road.

North Carolina.

Wilmington and Raleigh Railroad.—We closed our report of the proceedings of the stockholders of this company on Saturday, by stating they had not adjourned at 10 o'clock, P. M. They did not adjourn till after 11 o'clock, having finished their business before they left the hall.

A resolution was offered to divide 2 per cent. of the surplus balance of cash on hand among the stockholders, which is equal to 3 per cent. on the capital stock.

This resolution was amended on motion of Dr. Frederick J. Hill, as follows:

Resolved, That the available means, \$45,000, should be applied to the extinguishment of the debt of the company, and the president and directors are instructed to apply it to the payment of such debt as may in their judgment most conduce to the prosperity of the company.

The stockholders separated under the influence of the most kind and friendly feeling, and were much cheered by the fine prospects of the road, its growth in favor with the public, and the faithful and efficient manner in which its concerns had been managed by those having charge of the same.

—Commercial.

The Great Central Railroad.

Among the many railroad enterprises of the day, perhaps the most remarkable is the almost continuous line extending westwardly through the centres of the States of Pennsylvania, Ohio, Indiana and Illinois to the Mississippi river opposite St. Louis, and from the latter point to the western line of Missouri. It is almost equally remarkable that while the projectors of many of the links of this extended chain have located their roads mainly with a view to local advantages and the development of local wealth, they have so adjusted them as to make in almost every instance, the nearest practicable approach to the air line from New York to St. Louis and the Bay of San Francisco. This central line is nearly equi-distant from the northern lakes and the Ohio river, and passes through the richest portions of the States intersected by it. It affords a ready access to market for the products of those districts of country which have been heretofore farthest removed from the great natural thoroughfares above mentioned, thereby increasing the value of their lands and products and swelling the tribute of trade pouring into our great eastern markets. The fact is worthy of note, that this line of communication, in passing through the States of Ohio, Indiana and Illinois, follows the route of the National road, the chosen and habitual route of land travel between the east and the west. That this will hereafter be the favorite route for travel and transportation appears probable, not only because it presents the shortest line between the Mississippi river and New York and Philadelphia, but

also, from the fact that its latitude is the most favorable which can be imagined; being far enough south to avoid the heavy snows which often impede operations on the northern roads, and so far north as to transport every kind of product without danger of injury from heat.

There is a class of products for the transportation of which railroads do not now and perhaps never will successfully compete with our rivers and lakes. For this reason all lines of road running parallel and near to those natural thoroughfares must yield the preference to them. But where no such natural channels of trade exist, the railroad monopolises the traffic. The country lying immediately adjacent to the Ohio river and the lakes is, in general, inferior in fertility to the central portions of the States named. The width of country tributary to a road running along those water thoroughfares, is of course less than that upon the central route. From all these obvious considerations, it must be apparent, that the 'Great Central' route of railroad, will not only confer a greater benefit upon the country than any other, but that it will enjoy a controlling advantage in point of both the through and the local business. The north and south lines of road and canal cannot be competitors nor rivals of this work; each will aid the other; especially will they be tributary to this line of road. The great currents of travel and transport set east and west, seeking the shortest and most expeditious route; and all the lateral currents rush into this main stream. The influence of rival interests may for a little time deflect trade from the right line, but this perversion will be only temporary and cannot long be maintained in violation of the controlling law of trade.

The enterprise and energy displayed in prosecuting the various parts of this great work are proportioned to its magnitude and importance. From Philadelphia westward the road is completed to Johnstown; and active measures are in progress for its extension not only to Pittsburgh, but by the Hempfield railroad route on the air-line to Wheeling. From Wheeling to Zanesville, the subscription of stock to the Central Ohio railroad is rapidly filling up. From Zanesville to Newark the line is under contract and will be completed the next summer; and the entire line from Zanesville to Columbus will be completed within fifteen months. From Columbus to the Indiana boundary, occupying ground which will ultimately be conceded to the Central Ohio company, from the greater economy of working a consolidated line—several interests are found arranging themselves, perhaps unconsciously, in line—the Columbus, Xenia and Dayton—the Columbus, Springfield and Dayton—the Dayton and Western, and the Richmond and Miami railroads may not only become absorbed in the Central Ohio railroad interest, but that interest itself may be ultimately swallowed up in a more comprehensive consolidation, and become a part of the "Great Atlantic and Mississippi line," a name which, by the bye, is already given to that portion of the route which traverses Illinois. The Terre Haute and Richmond railroad, extending across the State of Indiana, is in a good state of forwardness. Measures are in progress for putting the part extending from Richmond to Indianapolis under contract at an early day. From Indianapolis to Terre Haute the line is nearly ready for the rail, and will be in full operation by December, 1851. The survey of the route across Illinois, from Terre Haute to St. Louis, is nearly completed, and a large subscription of stock has been made. In Missouri, correspondent to the grandeur of the conception that looks to a railway across the continent, a company has been organized, large amounts of stock have been taken, and surveys are actually in progress upon the route of the Pacific railroad.

In less than five years from this time, there will be a continuous line of railroad in operation over the route we have indicated from New York to the western part of Missouri; and making, throughout nearly its entire length, the nearest practicable approach to an Air Line in the direction of San Francisco.

To no States is the construction of this work of greater importance than to Ohio and Indiana. Railroads are changing, to a great extent, the channels of trade. In time, they will in a large degree become competitors with the navigable waters in

the carrying trade. It is, therefore, important, as a matter of public policy, that railroads should pass through those districts whose natural capacity for production promises the largest amount of local business.

As a general rule, the local business of a road contributes more largely to its revenues than the through transportation; but, when the two are united in a large degree, of course no element of success can be wanting. Sooner or later a railway communication will be had between New York and San Francisco; and, not only to accommodate itself to the sublime destiny of being the world's commercial artery, but also to meet the requisitions of a great national trade, will all the railway interests we have adverted to be compelled to throw out every needless foot of distance. When such a necessity is contemplated, what a decided preeminence must be conceded to the Great Central Atlantic and Pacific line.—*Terre Haute, Ia., Journal.*

Indiana.

We copy from the Lafayette Journal the following extract from a series of articles in that paper, written by Hon. A. S. White, President of the Lafayette and Indianapolis railroad. In addition to its intrinsic merits, it is well worth perusal, as giving a good idea of the feeling which prevails throughout the west upon the subject of railways:

The productions of the soil and of labor, are the immediate and only sources of national wealth.—Railroads are the best media through which the products are made available to the general use and convertible into the standards of value. Of what account is our fertile soil, and to what end shall we labor, if we remain in our pastoral and primitive seclusion? The ascent of the steamboat up our river, and the completion of our canal, have marked successive eras of improvement in our condition, and if all the world stood still around us might continue to sustain us in our present growth. But are we content with this? For ourselves and for our children, our ambition as citizens aims much higher. Planted in the best part of the Mississippi valley, where all the comforts and luxuries of civilized life may be reached in their highest excellence, we desire to see all our resources unfolded, and our society advance in all its various forms. This will not only be realized in an increase of our wealth, but in the heightening of our moral and intellectual condition. In these channels of commerce, arts and manufactures will follow. The intercourse of the world will bring to us its intelligence. We shall be visited by the best classes of emigrants, and with the increase and improvement of our population, Schools, Lyceums, Churches, Agricultural and Mechanical Societies, will be instituted and sustained, general intelligence will increase, social intercourse will be refined and promoted. To none are these results so interesting, as to our country friends and their young families.

Hitherto the great waters have been the sites of cities and the points of enterprise; and ships, the messengers of commerce, have connected continent with continent and city with city, but those "canvas-backed birds of the ocean" could never display on our prairies the rich exchanges of commerce. Soiled, faded, and out of time, those exchanges came to us in Canestoga waggons or sluggish canal boats. The traveller who would record our manners or note our history, passed around our inaccessible region. On account of her contiguity to the great lakes and to "The Father of Waters," even our younger sister Illinois has stolen our name and the honors of our primogeniture. Throughout the entire east the whole region west of Ohio was known only as Illinois, and Hoosier character was just enough developed to point some tale of romance, whose hero was the wondrous man of civilisation and the affright of ladies. A gentleman just returned from Rochester told me, that an intelligent friend there inquired of him "if Lafayette was on Fox river?"

It is the glory of the railroad system that it has brought the country in contact with the city; or rather that it has brought the city into the country. Selecting its own track, always a golden one, it does not travel over sterile fields of ocean, or along miasmatic and overflowed valleys; but speeding

through a thousand harvest fields and past as many workshops in a single day, it leaves its tribute and scatters its favors with the quickness of thought ready to return again on its diurnal round through the circuit of the year, fearing neither frosts, nor drought, nor tempests, nor embargo, nor blockade.

If this language is figurative, it portrays facts of our daily experience. The railroad has proved itself the dominant system of the 19th century. No city or village now can flourish which is cut off from its influence. Look at the expensive race of rivalry that Boston and New York, and the slow-moving city of Philadelphia, and Baltimore with her unflinching perseverance, are running to secure by this instrumentality the western commerce! See how Buffalo, enthroned on the lakes, and her great Erie Canal, has been startled at the thunders of little Dunkirk! How Dayton, nearer to us, in her cobweb of turnpikes and secure in the fatness of the Miami valley, has embarked with an alarmed but determined zeal, almost too late, in the railroad career! How Cincinnati, after the sun of her prosperity has culminated, and when, to use the language of Dewitt Clinton, applied to New York city some thirty years ago, "she has reached the self-sustaining point," and how Louisville, even while I am writing, have poured out each a million of treasure to avoid, by an anchorage of iron, being thrown from their orbits! Look also, at the smiling countenance of our coy neighbor Indianapolis, whom nature destined to rurality and consigned to the genius of Parchment and law-giving, but whom art has snatched from this "manifest destiny" and made her the centre, geographically at least, of this western world! Many railroads cannot be built. Those favorably situated as trunk lines, and first in time, secure to the regions they penetrate advantages, that we now can scarcely realize.

Growth of Western Cities.

By the complete returns of the census of this city, it appears that the population of Chicago on the 1st of June last, was twenty-eight thousand, two hundred and nine.

To show how rapid has been the increase of the Garden City, we append the census of preceding years as follows:

Year.	Population.
1845.....	12,088
1846.....	14,164
1847.....	16,859
1848.....	20,724
1849.....	23,017
1850.....	28,209

As compared with other lake cities, Chicago, by her rapid strides, bids fair soon to lead them all, as the following table will show:

	1845.	1850.
Milwaukee.....	9,508	29,035
Detroit.....	13,055	21,057
Cleveland.....	—	17,600
Buffalo.....	29,773	42,266
Chicago.....	12,088	28,209

North Carolina.

Wilmington and Raleigh Railroad.—The annual meeting of this company was held at Wilmington on the 14th inst., at which the following named gentlemen were re-elected directors, viz:—General John McRae President, P. K. Dickinson, Edward B. Dudley, Gilbert Potter O. G. Parsley, Wm. A. Wright, and J. D. Bellamy.

The report of the directors was made and directed to be printed. The company voted "to apply the available means, \$45,000, to the extinguishment of the debt of the company, and the President and directors are instructed to apply it to the payment of such debts as may in their judgment most conduce to the prosperity of the company."

The above embrace the chief matters acted upon as far as we could gather from newspaper reports of the proceedings. We hope soon to receive the report, the substance of which we shall lay before our readers.

Vermont.

Vermont Central Railroad.—From the recent annual report of this company, we make the following extract, showing its financial condition:

Construction.....	\$3,991,690
Equipment.....	366,847
Due C. Paine for materials.....	51,655
Interest paid on loans and bonds.....	242,735
Commissions on sales of bonds.....	8,820
Interest paid to stockholders.....	471,673
Amount to debit of suspense account.....	13,996
Cash on hand.....	28,728
Notes receivable.....	451,807
Stocks—Boston and Prov., Vt. Central, and Grand Junction railroad, Vt. Telegraph, &c.....	212,115
Amount to debit of individuals, includ. S. F. Belknap's acc. previous to Sept., 1849.....	608,364
Running expenses from June, 1848, to Nov. 1, 1850.....	144,590
Profit and loss.....	1,096

Cash paid in.....	\$6,594,026
Funded debt—bonds due 1852.....	\$4,575,242
“ “ “ “ 1856.....	597,000
“ “ “ “ due stockholders, payable in bonds.....	192,400
Notes payable.....	79,248
Earnings of road from June, 1848, to Oct. 1, 1850.....	730,550
Forfeited assessments.....	381,182
Due Vermont and Canada road.....	977
	37,427
	\$6,594,026

Steamboat Building in the U. S.

We copy from the Cincinnati Chronicle the following statistics of the number of steamers built in the United States since 1824—twenty-five years in periods of five years each.

From 1824 to 1829.....	194
From 1829 to 1834.....	304
From 1834 to 1839.....	405
From 1839 to 1844.....	521
From 1844 to 1849.....	969

Total.....2,493

Two thousand five hundred steamboats built with in twenty-five years! These boats have averaged about 200 tons, and consequently the steamboat tonnage in that period has amounted to five hundred thousand tons!

But, let us see what part the west had in this business. From the reports on commerce for the years 1846, '48 and '49, we find, that in three years, the steamboats built in the west compare with the total number, as follows:

	In the west.	Total.
In 1846.....	130	175
In 1848.....	152	225
In 1849.....	155	208

Aggregates.....437.....608

Thus we see that two-thirds of the steamers built in the Union, were built on the waters of the west.

The proportions built in Ohio and in Cincinnati stand thus:

	In Cincinnati.	In Ohio.
In 1846.....	29	34
In 1848.....	16	17
In 1849.....	38	44
Aggregate.....	83	95

It appears that one-sixth part of the steamboats built in the Union are built in Ohio, and one-seventh part built in Cincinnati.

The largest number of steamers built, at one place, are built in Pittsburgh, and its neighborhood. Several boats, within the last two or three years, have been built at Brownsville, on the Monongahela, but are recorded at Pittsburgh. The

next largest place for steamboat building is Cincinnati; but in the course of the last twenty years there has been little difference between steamboat building at Pittsburgh or Cincinnati.

As to the number of steamers moving along the western waters, we can approximate the number very nearly. In the year 1826, there were 143 steamboats carrying 24,000 tons, navigating the western waters.

In the last five years, there have been built 1,000 steamboats, and of those 700 were built in the west. The life of a steamboat does not average more than five years on the western rivers, but there are a large number of boats, which have been patched up, and are much older than five years. It is safe to say then, that there are more than eight hundred steamers now running on the western waters, six times as many as in 1826. Thus we see one element of the growth of western commerce; a commerce whose magnitude must at an early day surpass anything the earth has yet seen of commercial developments.

Peat—Important Discoveries.**The Irish California of 1848.**

About a year and a half ago Lord Ashley and O'Gorman Mahon started the House of Commons by an announcement that a method had been discovered by which Irish peat could be made to yield a variety of products of the most valuable kind, which would realise in the market a profit of upward of 100 per cent. Much excitement was created by it at the time, and it was boasted that Ireland had at length found a means of wealth that would raise her forthwith to the height of prosperity. A few explanations, however, showed that Lord Ashley, in speaking on an Irish subject, had fallen into the common infection of Irish precipitancy, and that although the products he mentioned could undoubtedly be obtained, there was no satisfactory evidence as to the real cost of the process and its consequent profit. He had, it is true, produced a candle made from the peat, and had lighted it on the table of the House, but without some illumination in the way of actual figures, this step could have only the effect of a pretty trick.

Since that time, however, the party by whom the patent was taken up [Mr. Owen, a private gentleman of property and of unquestionable integrity.] has caused the experiments to be carried on upon a definite scale, and results have at length been arrived at, it is said, of the most satisfactory kind, by which not only the candles and other products can be exhibited, but their cost, as it would appear, can be definitely estimated. The following statement of the annual expenditure and produce of the trial works for one year has just been placed in my hands:

Expenditure.

36,500 tons of peat, at 2s. per ton.....	£3,650
455 tons of sulphuric acid, at £7.....	3,185
Wear and tear of apparatus, &c.....	700
Wages, labor, &c.....	2,000
Cost of sending to market and other incidental charges.....	2,182
Profit.....	11,908

Total.....£23,625

Produce.

365 tons of sulphate of ammonia at £12 per ton.....	£4,385
255 tons of acetate of lime, at £14.....	3,575
19,000 gallons of naphtha, at 5s.....	4,750
109,500 pounds of paraffine, at 1s.....	5,475
73,000 gallons volatile oil, at 1s.....	3,656
36,000 gallons fixed oil, at 1s.....	1,800
Total.....	£23,625

These results have not yet been made public in any way in London, but if they should be fully borne out they will create a great sensation, since nearly one-seventh of the whole surface of Ireland consists of bog. The commercial value of the various articles has been stated considerably below the existing market quotations, and the charcoal which would also be obtained in the process has

been entirely omitted from the estimate, as well as the subsequent value of the land that would be reclaimed by the removal of the peat. The statement shows, nevertheless, a profit of more than 100 per cent. The paraffine is a fatty, inodorous matter, and it is from this that the candles are made. I have one of them burning before me at this moment, and its appearance and flame are the same as wax. The light, however, seems rather less white than from the spermaceti. The largest candle manufacturers in London have fixed the price they are willing to give for the paraffine at 1s. per pound.

POPULATION OF BALTIMORE.

The following are the complete returns of the population of this city.

Districts.	Comprising.	Free.	Slaves.
1st,	1st and 2d wards,	23,981	164
2d,	3d and 4th wards,	19,003	445
3d,	5th and 17th wards,	15,417	129
4th,	6th and 9th wards,	13,512	243
5th,	7th and 8th wards,	16,480	135
6th,	10th ward,	4,703	419
7th,	11th and 18th wards,	20,255	420
8th,	13th ward,	5,303	265
9th,	14th ward,	7,205	176
10th,	15th and 16th wards,	15,739	441
11th,	12th, 19th, 20th "	24,403	287

20 wards.....	166,001	3,124
Entire population.....	169,125	
Dwelling houses actually occupied.....	25,006	
Number of deaths reported from 1st June, 1849, to 1st June, 1850.....	3,650	

CONGRESSIONAL APPROPRIATIONS.

More than three pages of a supplement of the National Intelligencer are occupied with a report of the clerk of the House of Representatives, detailing the appropriations made during the first session of the thirty-first Congress. The aggregates under the several heads are as follows:

Civil, diplomatic and miscellaneous.....	9,388,368	32
Military and fortifications.....	9,341,822	45
Indian department, including, naval, revolutionary, and other pensions.....	4,537,573	81
Naval service.....	10,413,135	39
Postoffice department.....	5,447,589	82
In fulfilment of the treaty with Mexico.....	3,360,000	00

\$42,488,509 77

Pacific Railway.

The Tribune is out with a long article in defence of "Whitney's Railroad." As it is a "Land Reform" paper, it attempts to show the compatibility of this grant with the principles it advocates. In the article referred to, after reciting the nature of the proposed grant to Mr. Whitney, it goes on to say, "that the land does not in any sense pass into Mr. Whitney's own possession; he is merely charged with the right of selling it; the title comes directly from the government." This is a direct misstatement of the nature of the grant, as will be seen by the following extract for the bill reported in his favor. The bill provides that—

"Said Whitney shall first survey, fix upon, and locate the route for said road to a suitable bridging place on the Mississippi, if the road commence on or near Lake Michigan, or, if commencing at the other point, to such distance as shall be necessary to secure the land for the purpose aforesaid. He shall also commence the work with machinery, preparations, and arrangements for its continuance, and complete ten miles of road, according to the best plan of construction of railroads in the United State at the present day, with a single track, on a gauge or width of not less than six feet, and with an iron rail of not less than sixty-four [64] pounds to the yard, at his own expense, and to the satisfaction of the commissioner hereinafter directed to be appointed, to be charged with the interests of the United States, who shall certify to the Commissioner of the General Land Office that said road

has been substantially made and constructed, and is in all respects in conformity to the requirements of this act, and that said road is progressing; and thereupon said Whitney, and his assigns, shall be entitled and fully authorized to sell, at public or private sale, the first five miles of the breadth of said land so set apart for the construction said road, and one-half part of the equivalent lands selected in lieu of what may have been sold; and the Commissioner of the General Land Office shall cause patents to be issued the same as for lands sold by the government, said patents to be delivered to said Whitney for the purchasers under contracts by and with him; and the title shall be the same as if they had purchased directly from and paid to the government for the lands."

Now Mr. Whitney may assign his grant the moment he gets it, and Congress is bound to convey the land to his grantee, who, if he has got money enough, may build the road for 800 miles, and hold every acre granted for this distance. Or, Mr. Whitney may cause a conveyance to be made one day, to one person, and take a reconveyance the next, and hold the whole amount himself. Curious "Land Reform" this. The Tribune either will not see the truth, or is most egregiously humbugged in this matter.

Michigan.

Michigan Central Railroad.—The traffic over the Central Michigan road shows a large gain over last year. The earnings thus far have been—

	1848-9.	1849-50.
December	19,103 84	36,749 20
January	17,390 65	16,006 07
February	15,367 25	19,302 78
March	18,243 67	28,673 10
April	34,485 08	53,692 91
May	74,190 28	108,734 52
June	48,386 68	70,313 56
July	33,683 71	56,585 03
August	45,009 98	78,195 44
September	95,544 91	117,078 00
October	126,138 50	165,572 93
November	78,835 06	48,635 00
	\$606,370 61	\$800,659 54

* First twelve days.

The receipts for the present month are estimated at \$100,000. Taking this estimate as correct, and the total receipts for the current year are \$910,839 54—an increase of \$304,388 93 over last year.

Ohio.

Lake Shore Junction Railroad between Cleveland and Sandusky City.—The Sandusky Clarion states that "this important link in the great thoroughfare to Boston and New York, was put under contract on very favorable terms at Elyria, on the 13th inst., and the work has already commenced, with a certainty of its entire completion within the year.

The contractors are gentlemen of great energy, moral worth and high character; and abundant means for the rapid prosecution of the work are provided. The distance to Cleveland is 55 miles; from Sandusky City to Toledo is 43 miles; making the length of the Lake Shore road 98 miles."

Indiana.

A large meeting was recently held by the citizens of Falmouth and vicinity to facilitate the early completion of the Jeffersonville road to intersect the Terre Haute and Richmond route at Cambridge City. The total cost of this road, 124 miles, is estimated at \$1,055,600.

A railroad meeting was held on the 2d inst., at Cambridge City, to aid the great railway enterprises of the west, and especially to hasten the completion of the Terre Haute and Richmond railroad and the Jeffersonville road to Cambridge City. This meeting resolved that it was for the interest

of the Jeffersonville railroad company to extend their road from Columbus to intersect the Terre Haute and Richmond road at Cambridge City, and that they were in favor of tendering to the Jeffersonville company the use of "our road from this place east."

The board of directors of the Terre Haute and Richmond road, and of the Dayton and Western railroad company were also requested to take this matter into consideration.

Tehuantepec Railroad.

This work is making very rapid progress; about \$1,000,000 has been subscribed to the stock of the company in New Orleans—a sum sufficient to the immediate wants of the company.

The necessary steps have also been taken to open this route immediately for passengers going to California. A steamboat has been chartered to run between New Orleans and the Coatzacoalcos river. New Orleans is fully aroused to the importance of this work, and is the whole city is interested in the enterprise, we may expect to see the whole line opened with all the dispatch consistent with the magnitude of the undertaking.

Vermont.

Vermont Central Railroad.—At the meeting of the Vermont Central railroad company at Burlington, on Tuesday, the following gentlemen were appointed directors for the ensuing year: Chas. Paine, of Northfield, president; James R. Langdon, of Montpelier; J. P. Putnam, Charles O. Whitmore, and James C. Dunn, of Boston; John Smith, of St. Albans; and John Peck of Burlington.

DISCOVERY OF A THIRD RING TO THE PLANET SATURN.

We understand that last night the existence of a third ring around this planet, which had been for some time suspected, was ascertained by the astronomers at the Observatory at Cambridge. It is inferior to the two others, and therefore its distance from the body of Saturn must be small. It was well observed through the great Equatorial, with powers varying from 150 to 900, the evening for astronomical observations being remarkably fine, perhaps the finest since the establishment of the Observatory, although, singularly enough, the sky was so hazy, that to the naked eye only the brighter stars were visible. It will be remembered that the eighth satellite of this planet was also discovered at Cambridge, by Mr. Bond, about two years since.—*Boston Traveller.*

Ohio.

Mad River and Lake Erie Railroad.—Earnings in October, 1850:

Passengers	\$25,778 67
Freight	37,485 09
Mails	717 91
	\$63,981 67
Expenses	20,452 30

Net income for the month... \$43,529 37

This amount, we are informed, is one and three quarters per cent on the cost of the road.

Railroad Connection West of the Ohio River.—Contracts are advertised for letting 22 miles of the Columbus, Piqua and Indiana railroad, between Covington, Miami county, and a point in Champagne county. The Piqua Register says:—

"This road, then, which is intended to form an important link in the great Central railroad through Ohio, connecting at the Ohio river with the Baltimore and Ohio railroad and the western line of our great State with one to the Mississippi river and another extending northwest to Chicago, etc., will be made and that too, in a reasonably short time.

The present condition of the company is such as to fully warrant the step the board has now taken; and its prospectus such as to justify the belief that the work will go forward uninterruptedly to a speedy completion. The agent who was sent east by the board a short time since with the county and township bonds subscribed, has returned—having made an arrangement very favorable to the interest of the road and entirely satisfactory to the company."

Southern Michigan and Northern Indiana Railroad Companies.

The directors of these companies met in the town of Elkhart, on the 22d ult., it was settled that Bristol, Elkhart, Mishawaka, South Bend and Laporte should be points on the main line of the road, and a resolution was adopted, "That the road from Toledo to Laporte shall be completed and the cars running on the whole line by the first day of January, 1852."

Arrangements have also been made to complete the road through to Chicago in the same time.—The iron road, uniting the Mississippi and Atlantic, by this route, will soon be completed. The road from New York to Dunkirk will be finished in May next—from Dunkirk to Cleveland the entire line is rapidly progressing, and will be done in 1851. From Cleveland to Toledo, the necessary means are secured, and arrangements are being made for its speedy completion. The Chicago and Galena road is progressing rapidly, 42 miles being already built. Thus, it is confidently asserted, that the Mississippi and Atlantic will be united by an iron road, and by this route, 1200 miles in length, within the next two years.—*Cin. Gaz.*

Connecticut.

New London Railroad.—We understand this road is to be immediately put under contract, from this city to Saybrook—and the balance of the route as soon as it is settled whether it will run to New London or Norwich; a strong interest having sprung up in the latter city to favor its connection with the Norwich and Worcester road. As soon as that point is settled, the whole project will be pushed on with vigor. We think it will be operated during the year 1851.

New York.

A party of engineers are now engaged in making a survey between Little Sodus Bay and Oswego, for a railroad connecting Lake Ontario with the New York and Erie railroad, and passing through Auburn.

The subscriptions already raised in that city, and in the county, place this enterprise among the practicabilities and probabilities.

New Jersey.

Notice is given in the Sussex Register of an application to the next Legislature to charter a company with a \$500,000 capital, to build a railroad from the line of division between New York and New Jersey, through Warren and Sussex counties to the Delaware river, within six miles of its junction with Paulus Kill.

The following applications are to be made to connect, the next New Jersey Legislature, viz:—for a railroad from Freehold to connect with the Delaware and Raritan Canal and railroad, at or near Dean's Pond; for a railroad from a point on the Delaware river, at or near Camden, through Burlington, Ocean and Monmouth to some point on Raritan Bay, at or east of Keyport, in Monmouth county, with a capital of \$2,000,000, also to charter a railroad company with \$500,000 capi-

tal to construct a road from some point on the line of division between Warwick and Blue Mountains, through Sussex and Warren to the Delaware river within a mile of Paulus Kill.

AMERICAN RAILROAD JOURNAL.

Saturday, November 30, 1850.

The results that are destined to flow from the completion of the projected lines of railroad which are to connect the extreme parts of our country, and to unite our great Atlantic cities with the Mississippi valley, can hardly be appreciated; though the growth of New York for the five past years affords a pretty good illustration of what we may expect to see in the progress of Philadelphia and Baltimore, and in the increased growth of New York, when their great lines of railroad extending west shall be completed. The growth of Baltimore and Philadelphia for the past ten years has depended chiefly upon the increase of the business of the country with which they were immediately connected. Baltimore yet enjoys no connection with the Ohio, either by railroad or canal. Philadelphia is connected with this river by a canal, but this is interrupted by the Alleghenies, and from the unfavorable nature of the country for a work of this kind, it has failed to secure to that city what was anticipated from it. Boston, taking into consideration her natural advantages, has shown a much more rapid growth than either Baltimore or Philadelphia, and is unquestionably the third city in the Union, if we number among its inhabitants all that properly belong to it, from their business connections. By far the larger part of her business men reside out of the city. The conveniences of railroads enabling her merchants residing from five to ten miles out to reach their places of business with the same ease that a New Yorker, residing above Bleeker street, can reach his. Boston is the least favorably situated for western trade than either of the above cities, and feels more sensibly the influence of New York; yet owing to her magnificent lines of railroad, she has, as we have said, gained much the faster.

New York now enjoys means of intercourse with the west vastly superior to any Atlantic city, though this is almost entirely interrupted for about five months each year. Since the completion of the Michigan Central railroad, and the railroads from Cincinnati and Lake Erie, the journey from this city to Chicago and Milwaukee, can be performed with the greatest ease in three days, and by means of the Illinois canal, the Mississippi can be reached over the same route much quicker, cheaper and easier, than through any other. The consequence has been, that this has become the great route of travel in the summer months, not only for western, but for a great portion of the travel between the north and south. New York at the same time enjoying the monopoly in the export of western produce, the opening of the above great line for travel has tended to concentrate business in this city for a few years past to a remarkable degree. This increase of business is shown in the growth of this city for the past five years, which has been at the rate of more than 50,000 per year, including its suburbs, where her business men reside. Brooklyn, New York and Williamsburgh contained in 1845, 430,000 inhabitants. These cities now contain about 680,000, showing an increase in this period of 250,000, to say nothing of neighboring villages, which are increasing with extraordinary rapidity.

No small part of this increase is owing to the superiority of our avenues for communicating with the west. New York is now the most accessible of all her rivals, and through the means of intercourse she enjoys, she feels in her own growth every step made by the great west in its onward career. Every mile of railroad or canal constructed adds its quota to the vast flood which is now pouring in upon her, and is, as far as the business of this city is concerned, as much a New York canal and railroad as if it were within the limits of this State.

In the growth of New York, we see the influence which works that facilitate intercommunication exert upon the growth of towns; and from her growth we can form some estimate of what the Pennsylvania Central railroad, and the Baltimore and Ohio railroad will accomplish for the two great cities which constitute their eastern termini. New York is now the most forcible illustration that can be formed of the influence of railroads, as her more rapid growth is directly attributable to her more favored position in reference to such works.

Pennsylvania.

A railroad convention is to be held at Allentown on the 3d of December, with a view to connect the city of New York with the Schuylkill coal fields, by a direct road via Allentown. The people of Schuylkill and Lehigh counties are urging the project. Meetings are being held in Pottsville and Tamaqua to appoint delegates.

Southern Railroad.

Among the numerous projects for connecting the Atlantic and Mississippi by railroad, the one requiring the least effort to complete, and at the same time one of the most important, is the *Southern railroad*, the object of which is to connect the Vicksburg and Jackson railroad, in Mississippi, and the Montgomery and West Point road, in Alabama.—The completion of this link would at once open a railroad communication between Charleston and Savannah and the Mississippi. The completion of the Atlanta and Lagrange railroad is soon to supply the only link wanting in the chain, from Montgomery to the Atlantic coast; while on the western end of this great line, a railroad is already in operation to Brandon. From Brandon to Montgomery the distance cannot be over 250 miles; with a route so favorable, that the whole cost could not exceed \$15,000 to the mile. The country on the line of the proposed road, is one of the most fertile and wealthy portions of the South, with abundant means. The only thing that can be lacking is the will, to secure this portion of the line at the earliest practicable moment. At Selma, which is about 50 miles west of Montgomery, the proposed road would connect with the Alabama and Tennessee railroad, which is now pushing northward with energy and vigor, to connect with the great line in progress through eastern Tennessee and western Virginia. Between Selma and Montgomery, the Alabama river would at present supply the immediate necessity for a railroad, leaving the distance to be built only about 200 miles.

Some movements have recently been made to secure the commencement of this work, but we do not learn that they have yet amounted to much. No man has yet been developed, as far as we can see, with a mission to carry out this work. We are satisfied that should this matter be properly brought before those immediately interested, and public sentiment concentrated upon some feasible plan, its accomplishment would be a very easy task; and that the enterprise might prove a very profitable

one. There is one thing, about which those interested may feel assured, that they will never see a more favorable time, as far as abundance of money and the low price of iron is concerned, for the construction of a railroad, than the present moment.

Indiana.

Chauncey Rose, Esq., President of the Terre Haute and Indianapolis railroad company has just completed a contract on favorable terms for the iron for the entire road, (about 70 miles.) The whole quantity is to be delivered at New Orleans on or before May next, and it is intended to have the road for the whole distance between Indianapolis and Terre Haute opened for traffic during the next autumn.

Pennsylvania.

We compile from the Messenger the following synopsis of the Pittsburg, Steubenville and Indiana railroad company:—

"Organized early last spring; capital then, \$500,000; present capital \$600,000—10 per cent paid in; surveys in progress, under Mr. Blickensderfer; a portion of the road to be located this winter. The President, Hon. Daniel Kilgore, and James Parks, Esq., a director, are actively procuring subscriptions to the capital stock. The road is intended to reach from Pittsburg, Pa., to Newark, Ohio; and it is expected the excavation will be commenced next spring."

St. Josephs and Hannibal R. R.

The Mississippi is no longer the "*Ultima Thule*," the western limit of the projects designed to open to a market the vast valley to which that river gives the name. This is now transferred to the Missouri, some two or three hundred miles from what a few years since was regarded as the extreme boundary of enterprises of this kind.

Two projects are now engaging the attention of the people between these two rivers: one a railroad from Rock Island to Council Bluffs, and another between Hannibal on the Mississippi, and St. Josephs on the Missouri. The former of these is as yet only a project; the realization of which must depend upon the settlement of the country on its proposed line. The latter has this condition necessary to success, a well settled country, possessing ample means for the execution of such a work; the country on the line of this road being one of the best parts of Missouri, as well as the most densely settled.

Those interested in this road have two objects in its construction; first to secure to themselves the advantages of a railroad for ordinary purposes, and next, to carry to the Missouri river the great lines of railroad which are now in progress from the East. It will be seen, by reference to a map, that a prolongation of the Springfield and Meredosia railroad west, would strike the Mississippi near Hannibal. The Springfield and Meredosia, in connection with the Northern Cross road of Illinois, will form one of the trunk lines through that State, which will eventually connect itself with the roads of Indiana. The Hannibal and St. Josephs railroad will be a direct continuation of this great line, and will constitute a much shorter route for emigrants going west, than the more southern one by St. Louis. This fact would give to this road a large share of through travel. The country through which the proposed road is to run, is almost entirely destitute of navigable rivers, which adds to the necessity of this road, as an outlet for its produce.

The subject of railroads is a new one for the people of this State, but it is now receiving great at-

attention, and there can be no doubt that their construction will be commenced and pushed with the same vigor and energy which we now witness in Ohio and Indiana. Missouri is fast losing the idea of remoteness which we have been accustomed to attach to her. She is now the central State in this great confederacy, and through her must run the great thoroughfares, through which the tide of emigration will flow from one extreme to the other.—She is inferior to no one, if she is not superior to all, in extent, in fertility of soil, and in mineral wealth; and must soon become the theatre of some of our greatest enterprises, designed to develop this wealth, and make it available to the wants of men.

New Line of Steamers.

Our readers have probably seen in the papers notices of a projected line of steamers between Glasgow and Montreal. The Portland Advertiser of the present week states, that Mr. Buchanan, an eminent Scotch merchant, who is also connected with mercantile houses both at Montreal and in this city, visited that city the past week with a view to ascertain the fitness of the harbor for a steamship terminus, and also the exact condition of the railroad enterprises in which Portland capital is embarked, and especially as the prospects of the Montreal road. In company with Mr. Poor, he went over the Atlantic road as far as Bacon Falls in Greenwich, sixty miles from Portland, and examined all the wharves and other localities in Portland and in the neighborhood. Mr. Buchanan sailed in the Africa from New York on Wednesday, and will probably bring his scheme to the attention of the public the coming winter. The plan is to construct three iron steamers of 1,600 tons measurement, of the same general character as the steamer "Glasgow City," each steamer capable of carrying 6,000 barrels of flour or an equivalent amount of freight, with accommodations for seventy-five first class and seventy-five second class passengers—the steamers to run alternately from Glasgow to Portland and Montreal, till the completion of the road, and after that to Portland direct. These steamers would cost about £30,000 each. Certain New York houses propose to join in the carrying out of this scheme.

New York.

Rome and Watertown Railroad.—This road, which proposes to connect Rome with Cape Vincent, on the St. Lawrence, opposite Kingston, via Watertown, is making rapid progress towards its completion. The whole length of line is 97 miles. That portion of the road between Rome and Watertown, a distance of 73 miles, will be in readiness for the rails in July next. From Rome the cars are now running 35 miles, and will soon run seven miles further.

This road may be looked upon as a rival, to some extent, of the Ogdensburg railroad, in connecting the eastern part of Lake Ontario with tide water. From Sackett's Harbor to Albany, by this route, the distance is about 180 miles, and to New York 320, over very favorable, and in most cases descending grades. From Ogdensburg to Boston the distance by the Vermont Central and Northern railroad is over 400 miles. Sackett's Harbor too has a great advantage over Ogdensburg, in being much farther west, as well as much more accessible. In reaching tide water, the Rome and Watertown road has the advantage of over 200 miles of railroad, much better grades, and a much more accessible port on the lakes; and produce can reach New York by this route by a line nearly, if not

quite 100 miles shorter, than the route to Boston.

We give these data not for the purpose of injuring the Ogdensburg, or the Vermont roads, but simply to show that this city has nothing to fear from them, and that consequently no good reason exists against giving those roads the right to bridge Lake Champlain. That a large amount of produce designed for consumption in New England, would pass over this road there is no doubt; but very little if any would go over it for exportation. As far as home consumption is concerned we shall oppose no objection, and certainly none exists as far as our export trade is concerned. Nothing can ever deprive New York of this. The bulk of western produce must always come through the Erie Canal. The tolls on this canal will be reduced just so fast as it is necessary to enable it to retain its business. But should the produce which now passes through this channel leave it for the railroad, there is but little fear of its taking the long circuit by way of Ogdensburg, and climbing the Green Mountains, where they can reach tide water by a much more direct and easy route of half the length of the former.

New York.

The work on the Canandaigua and Corning railroad, we understand, is being prosecuted with all possible dispatch, and it is expected that by the first of August next it will be completed and in running order. By this route the time between Rochester and New York will be reduced to about 14 hours.

Ashuelot Railroad.

On Monday next the Ashuelot railroad, from Keene, N. H., to South Vernon, Vt., where it connects with the Connecticut river railroad, is to be open for public travelling, bringing Hartford in direct railway communication with Bellows Falls and Burlington, Vt.

The construction of this work forms a continuous line of railroad from New York to the head of Lake Champlain, a short distance south of Montreal.

Extension of the Morris and Essex Railroad.

A survey has been made under the superintendence of Mr. Bassenger, Engineer of this company, of the proposed route of the extension of this road from its present terminus to the Delaware Water Gap. The line of the proposed extension will commence at Dover, where the present road terminates, and passing through Stanhope and near Hacketts-town, along the valleys of the Musconetcong, the Pequest and Beaver Brook, ends at the Water Gap. A branch can be constructed from the main line to Belvidere, distant only about two miles. At Waterloo, the line will connect with the Sussex Mine railroad, running from that place to Newton. The distance from Dover to Belvidere, including the branch, is thirty-two miles. The curves are represented as favorable, and the grade nowhere exceeds fifty feet per mile. It is estimated that the whole cost of the road, including the equipment of the same, will not exceed \$800,000.

Virginia.

Orange and Alexandria Railroad.—We learn that contracts in small sections for the Orange and Alexandria railroad, have been taken by the former sub-contractors, and others, and all the hands formerly employed, have resumed their work. In a few days, the work will be more vigorously prosecuted than it has ever yet been.

COTTON SPINDLES OF THE WORLD.

The London Examiner gives the following table as an estimate of the number of spindles engaged in the cotton manufacture throughout the world:—Great Britain, 17,500,000; France, 4,300,000; United States, 2,500,000; Zollverein States, 815,000; Russia, 700,000; Switzerland, 650,000; Belgium, 420,000; Spain, 300,000; Italy, 300,000. Total, 28,985,000.

Kentucky.

The public debt of this State, as given in the Governor's Message, is \$4,247,637 81

Virginia.

Central Railroad.—Boston, New York, Philadelphia and Baltimore all have their favorite and appropriate lines, by which they seek to draw to each "the trade of the West." This they regard as the source of that life blood which is to make them all great and prosperous. Richmond is now asking herself the question why she may not lay claim to a share of this trade. Geographically, she is nearer to Cincinnati, the great metropolis of the West, than any of her rivals. She possesses, at the mouth of the James river, a harbor inferior to none, with the exception of New York. Richmond and Virginia, both, have come to the conclusion that they are entitled to a pretty large share of this trade, the largest moiety perhaps. All this may be very true in the abstract, but this *right* depends entirely upon the use of the proper means to get it; the same that has already secured it to the more northern cities. Virginia must build a railroad direct to the Ohio, through which this trade may flow into her, diffusing as it goes, life, energy and strength.

The following tables are claimed by the Richmond people, as showing the relative distances from Cincinnati to the cities of New York, Philadelphia and Baltimore in direct lines; and also by routes practicable for railroads.

The distances in direct lines are as follows:	
From Cincinnati to New York.....	535 miles.
Baltimore.....	400 "
Richmond.....	360 "

These are the air-lines; but by practicable railroad routes they will be expressed thus:

From Cincinnati to New York—	
Via Baltimore.....	780 miles.
Via Buffalo.....	900 "
Via Dunkirk.....	850 "
From Cincinnati to Baltimore—	
Via Wheeling.....	700 "
From Cincinnati to Richmond—	
Via Chillicothe and Guyandot.....	596 "

The work by which Richmond proposes to secure a portion of the western trade, is the *Central railroad*. This road is now in operation from that city to Charlottesville, a distance of 90 miles. From the latter place to Staunton, a distance of 40 miles, the road is in progress. From Staunton to the Ohio at Guyandotte, on the mouth of the Big Sandy river, a distance of something over 200 miles, nothing is done; and what is still more unfortunate, the greater part of the country for this distance is comparatively a forest, and can afford but little present aid to such a work. When this road strikes the Ohio, it will connect with the Cincinnati and Belpre railroad, of the construction of which there cannot now be a doubt.

The great obstacle to the construction of this line, and in realising all the benefits that are expected to flow from it, is the great Virginia link which is still untouched. Efforts are now making in various parts of that State to secure the necessary means to commence operations here. The State, we believe is to subscribe three-fifths of the sum re-

quired. The counties of Monroe and Greenbrier have each subscribed \$50,000. A movement is now making in Richmond to secure a subscription of \$100,000 in that city. If this sum should be voted, still these subscriptions make up but a fraction of the amount needed. A large sum, we presume can be obtained by private subscription.—But this is a work which will tax the energies of Virginia to the utmost. It is a road that must be built, and the sooner she sets about it the better.—Its construction is demanded upon every consideration of interest as well as State pride. It is the only work that can realise the expectations formed from the James River and Kanawha canal. Its immediate construction is necessary to divert at an early stage, a portion of western trade and travel, before these shall form other channels too deep to allow anything to flow here. Virginia for the past half of the present century, has been a great sleeping giant—strong, but unconscious of her strength. From the first, and with capacities which should have continued her the first State in the Union, she is now the fourth, with every prospect of being soon eclipsed by many others. Let her take the same course that has enabled States with less resources to distance her, and she will soon regain her natural position.

To Contractors.

SIXTEEN MILES of the Grading and a portion of the Masonry of the South Side Railroad, extending to a point opposite Farmville, will be let on the 17th of December next. The work is to be finished by the 1st of January, 1852.

Profiles, Plans and Specifications, will be ready for inspection at Petersburg by the 10th of December.

C. O. SANFORD,
Chief Engineer.

South Side Railroad Office,
20th December, 1850.

347

Rochester Scale Works. ESTABLISHED IN 1841.

THE Subscribers are manufacturing and prepared to furnish upon order all kinds of Scales, such as Canal Weigh Lock Scales, from 100 to 400 tons capacity.

Railroad Track and Depot Scales,
Cattle, Coal, and Hay Scales,
Dormant and Wheat or Hopper Scales,
Portable Platforms, and Counter Scales,
Sugar Crushers, Letter Presses,
Warehouse Trucks, Wheat Cars, etc., etc.

Our long experience in the business, and the facilities we have for manufacturing, enables us to supply all orders promptly. Every article made of the best material and warranted.

REFERENCES:

J. W. Brooks, Supt. Michigan Central R.R., Mich.
Benj. Loder, Pres. N. Y. & Erie R.R., New York
Charles Minot, Supt. do. do. do.
The Hon. Board of Canal Commissioners and Engineers of Erie Canal Enlargement.
E. F. Osborn, Supt. Mad River & Lake Erie R.R., O.
Sam'l Brown, Chief Clerk Freight Department New York & Erie R.R., New York.
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John Crookford, Agent Patterson & Hudson River R.R., New Jersey.
D. C. McCallum, Supt. Bridges & Buildings N. Y. & Erie R.R., N.Y.
B. Higgins, formerly Supt. Mansfield & Sandusky City R.R., Ohio.
A. H. Barber, Agent Mansfield and Sandusky City R.R., Ohio.
Charles Butler, Pres. Board of Trustees Wabash & Erie Canal, Indiana.
Jesse L. Williams, Chief Engineer Wabash & Erie Canal, Indiana.

DURYEE, FORSYTH & CO.

No. 15 Water St., Rochester, N.Y.

General Depot and Scale Warehouse,
No. 205 Pearl St., New York.

India-rubber Goods for Railroad Purposes.

THE Goodyear Metallic India rubber Co., (F. M. Ray, Agent) No. 104 Broadway, New York, (1 door from Pine street) has on hand and offers for sale at the lowest prices, an extensive assortment of Rubber Goods suitable for Railroad Companies, such as Hose of all sizes, Fire Buckets, Water Pails, Steam Packing, Car Covers, Taraulins, Clothing of all kinds for brakemen, switchmen, etc. Belting, and many other articles—all manufactured from Goodyear's Metallic India-rubber, and warranted to give satisfaction.

India-rubber HOSE is in use upon many railroads, for Tanks and Water Stations. It requires no oiling, is unaffected by heat or cold and is in every respect a most desirable article, and much superior to leather. All sizes, from 1 in. to 6 in., or larger if needed, made to order.

The reputation of India-rubber for steam packing is well established, and it is now almost universally preferred to any other kind of packing. It will stand a higher degree of heat and last longer than any other substance. An assortment of every thickness from 1-2d in. to 1 1/2 in. always on hand.

Every article sold by the Goodyear Metallic India-rubber Co. is warranted, and will be offered to railroad companies at the lowest factory prices.

The Goodyear Metallic India-rubber Co. is a connection of the New England Car Co., and in addition to its large stock of goods for railroad and other purposes, has on hand a large assortment of F. M. Ray's Patent India-rubber Car Springs, both bearing and buffer, of all sizes.

Great Work on Bridge Building, etc., etc.

JUST published in medium folio, One Dollar, 75 cts. to subscribers.

Part III of a "THEORETICAL AND PRACTICAL TREATISE ON THE CONSTRUCTION OF BRIDGES IN STONE, IRON AND WOOD," including the Equilibrium of Arches, the mathematical principles of the Oblique Arch, Suspension Arch, etc., Construction of Foundations in Water, Centering, Oblique Arches, etc., the application of Iron to Railroad Structures, Practical Tunnelling, Suspension Bridges, etc.; illustrated by numerous accurately executed Plans, Elevations, Sections and Details of Stone, Iron and Wood Bridges, Viaducts, Tunnels, Culverts, Machines, etc., constructed by the most eminent Architects and Engineers in Europe and the United States, and numerous Original Designs for Bridges, Viaducts, Culverts, etc. The whole calculated to meet the exigencies of Engineers, and assist Draughtsmen, Bridge Builders, Mechanics and Students. By George Duggan, Architect and Civil Engineer.

The present part contains beautifully executed plans, elevations, sections, and details of the Cast Iron Girder Bridge on the South Eastern R.R., and the Timber Viaduct with Stone Piers and Abutments and laminating pine Arches 120 feet span on the Newcastle and Northshields R.R., accompanied by Articles on the construction of foundations, including Piling, Cofferdams, Concrete, etc.

Published by George Duggan, 300 Broadway, New York, to whom all communications should be addressed and subscriptions forwarded.

Parties remitting Mr. Duggan \$5. and the remainder \$4 when they have been supplied with the first six parts of the "Theoretical and Practical Treatise on Bridge Building, etc." shall receive it monthly as published. To those making Mr. Duggan a present remittance of \$9, the work will be forwarded post free to any part of the United States.

Boardman's Patent Improved Steam Boiler and Furnace.

THE Patentee is now prepared to sell single or territorial rights to the use of the above named improvement. Recent experiments have demonstrated that this form of Boiler effects a saving of one-half the fuel required to run the best Cylinder Boiler with return flues, and about 40 per cent. of the amount used by Locomotive Boilers. The heat is so thoroughly applied to the water that the temperature in the chimney is reduced below 140 deg. The smoke and combustible gases are consumed within the furnace. The refuse gas instantly extinguishes flame or sparks, so that all danger from sparks is avoided. This Boiler is very compact in form, occupying less space than any other of like power.

References—Thomas H. Faron, Chief Engineer U. S. Mail Steamer Arctic, N.Y.; Messrs Mott & Ayres, and Mr. D. F. Jaycox, Chelsea Iron Works, 26th street N.Y.; Messrs. Tugnot, Daly & Co., Franklin Forge, 1st Avenue, N.Y.; Mr. John Mills, Machinist, 319 5th street, N.Y.; Mr. W. C. Smith, St. Albans, Vermont; and Messrs. Goulding, Green & Conro, Keeseville, N.Y. Address, post paid,
H. BOARDMAN, New York.

Railroad Spikes, Boiler Rivets, etc., etc.

THE Subscribers, Agents for the sale of James S. Spencer's, Jr., Railroad and Boat Spikes, Boiler Rivets, and Wrought Iron Chairs for railroads, made at his Works near this city, will execute all orders with promptness, despatch, and of the best quality.

ALSO IMPORTERS of English refined and Merchant bar Iron; Extra refined Car and Locomotive Axles (from 3 1/2 to 6 1/2 inches in diameter); B. O. Locomotive Tire (welded by Baldwin). Also, supply Boiler and Flue Iron cut to pattern or otherwise.—Spring, Shear, and Cast Steel, etc., etc.

T. & E. GEORGE.

Philadelphia, November 14, 1850.

Notice to Contractors.

ATLANTIC & ST. LAWRENCE RAILROAD.

PROPOSALS will be received by the subscribers, at Leary Tavern, in the town of Gorham, New Hampshire, until the 30th of November, for the Grading and Masonry of that portion of the Atlantic and St. Lawrence Railroad extending from Peabody's River in said Gorham, to the Connecticut River, a distance of about 30 miles.

Plans and profiles will be in readiness for examination after the 20th inst., at the Engineer's office at Gorham, N. H.

This line embraces some heavy work, and Contractors of means and experience will find this notice worthy of their attention.

Spirituous liquors will not be allowed on or about the work; nor will the propositions of Contractors be considered, who have heretofore failed to pay the laborers employed, on this, or any other public work.

Cash payments will be made monthly, reserving ten per cent. until the final completion of the contract.

WOOD, BLACK & CO.

Portland, Nov. 5, 1850.

NOTICE

For Proposals for Railroad Iron, for the Alabama and Tennessee River Railroad.

TO BE MANUFACTURED FROM ALABAMA ORE.

THE Alabama and Tennessee River Railroad Co. invite proposals, until the 1st of January, 1851, for Iron Rails, to be made of Alabama Iron, for the Northern Division and part of the Southern Division of their road, embracing a distance of about 105 miles. The rails are to be of the H pattern, in lengths of 18 feet, and weighing 63 lbs. per lineal yard. They are to be delivered on the Coosa river, at a landing to be hereafter designated, between Kimulgee ferry and Fort Williams, commencing their delivery on the 1st of November, 1851, and continuing it at the rate of from 80 to 100 tons per week, until the whole quantity required (10,500 tons) shall have been delivered. They are to be inspected by Lewis Troost, Chief Engineer.

It is proper to state to iron masters and capitalists at a distance, that the country traversed by the Northern and part of the Southern divisions of the road abounds in excellent iron ore and bituminous coal, and possesses every advantage for the successful manufacture of iron, health, cheap labor and provisions.

Further information may be obtained by addressing the President of the Company at Selma, Ala.

By order of the Board of Directors.

J. W. LAPSLEY, President.

Great American Engineering

AND MECHANICAL WORK, just published in a medium folio One Dollar, 75 cts. to Subscribers.

Part IX. of "Specimens of the Stone, Iron & Wood Bridges, Viaducts, Tunnels, Culverts, &c., &c., of the United States Railroads." By George Duggan, Architect and Civil Engineer.

The present part contains beautifully executed plans, elevations, sections and details of the Timber Bridge—3 arches 150 feet span—over the Lackawaxen river, and Delaware and Hudson canal on the line of the N. Y. & Erie R.R., and of an improved R.R. Suspension Bridge, invented and patented by Joseph C. Avery, of the C. C. and C. R.R., Cardington, Ohio, with Articles on the Application of Suspension Bridges to R.R. purposes, and explanatory of the engraving of the Timber Bridge across the Patuxeco river, at Elysburg, on the line of the Balt. and Ohio R.R.

Published by GEORGE DUGGAN,

300 Broadway, New York.

To whom all communications should be addressed and subscriptions forwarded.

Emerson's Patent Ventilator,

ADAPTED to Cars, Engine houses, Public Halls, Factories, Churches, School Houses, Dwellings, Chimney Flues, etc.



This Ventilator is stationary, and cannot get out of order. It is constructed in such conformity to certain ascertained laws of pneumatics, as to insure a constant draft outward, whatever may be the changing direction of the wind. The Massachusetts Mechanical Association have awarded a gold medal to the Inventor, and the Manufacturers have already disposed of over 3,000 of the article. Manufactured and sold by **CHILSON, ALLEN, WALKER & Co.,** 351 Broadway, New York.

Providence Tool Co.,

MANUFACTURERS OF

Plane Irons, Tooth Irons, Soft Moulding and Rabbet Irons, Cornice Irons, Plow Bits, and Planing Machine Knives:

NUTS, WASHERS AND BOLTS.

—ALSO—

PLATE HINGES AND PICK AXES.

They are prepared to execute orders for all descriptions of Cold Punching and Job Work.

WM. FIELD, Agent. RUFUS WATERMAN, Treas. PROVIDENCE, R. I.

Ibbotson, Brothers & Co's CELEBRATED CAST STEEL

AND

Best Cast Steel Royal Improved Files, well known as better adapted for Engineers' and Machinists' purposes than any now in use in the United States.

Every description of Square, Octagon, Flat and Round Cast Steel, Sheet, Shovel and Railway Spring Steel, etc., and Steel to order for any purposes—manufactured at their works in Sheffield—and universally known by the old stamp "Globe."

HENRY I. IBBOTSON, Agent,
218 Pearl st., New York.

Faggotted Car and Engine Axles

FORGED by RANSTEAD, DEARBORN & Co., Boston, Mass.

These Axles enjoy the highest reputation for excellence, and are all warranted.

American Cast Steel.

THE ADIRONDAC STEEL MANUFACTURING CO. is now producing, from American iron, at their works at Jersey City, N.J., Cast Steel of extraordinary quality, and is prepared to supply orders for the same at prices below that of the imported article of like quality. Consumers will find it to their interest to give this a trial. Orders for all sizes of hammered cast steel, directed as above, will meet with prompt attention.

May 28, 1849.

GRAHAM'S COMPOSITION, to Remove and Prevent Incrustation (or Scale) in STEAM BOILERS.

THIS valuable composition having been fully and extensively tested, is now offered to the public, as a sure remedy and preventive for incrustations in steam boilers of all descriptions. By its use, all scale is entirely removed from the boilers of Ocean and River Steamers, Locomotive and Stationary Engines, in from 3 to 20 running days, according to the size of the boiler and thickness of the scale. In New Boilers, all incrustation is prevented at a trifling expense.

The preservation of the boiler, great economy of fuel and labor, safety, and increased speed, are among the advantages to be derived from the use of this composition:

Orders should state the quality of water used, viz: "Salt," "Fresh," or "Brackish."

For sale, with directions for use, by

W. H. NEWMAN,
75 Pearl street,
New York.

TESTIMONIALS.

New York, August 17, 1850.

We have used Graham's Composition in the boilers of the Steamship Southerner, during several voyages between this place and Charleston. The boilers were old and very foul with scale, a very large quantity of which was removed by the use of the composition, and no new scale was formed.

From our own experience and observation in the use of the article, we are fully satisfied that it will effectually remove the incrustation made by sea water, and also that it will effectually prevent its formation.

We are also satisfied that the use of it will be attended with a great saving of fuel, and that it has no injurious effect upon iron.

DAVID N. MAXON, Engineer,
BERRY, Master,
Steamship Southerner.

Steamship Philadelphia, }
New York, August 27, 1850. }

"I have used 'Graham's Composition for Steam Boilers,' in the boilers of Steamship Philadelphia, on the voyage to and from Chagres, and am entirely satisfied that it will remove, dissolve and prevent all scale or incrustation in salt water boilers.

For the preservation of the boiler and economy of fuel and labor, I hereby recommend the employment of this composition in the Boilers of Ocean Steamers

WM. BISBY,
Chief Engineer.

Novelty Iron Works, }
New York, July 5, 1850. }

We have examined the specimen of Graham's Composition for preventing incrustation of steam boilers, and we believe it may be used with perfect safety in reasonable quantities for the purpose intended, as there does not appear to be any agent in the composition calculated to injure the iron.

STILLMAN, ALLEN & CO.

Piermont, May 20, 1850.
I have used "Graham's Composition," and find it to produce the intended effect; and I hereby, without hesitation, recommend it for Stationary, Marine and Locomotive Engine Boilers.

JOHN BRANDT,
Superintendent Motive Power
New York & Erie R.R.

New York, July 25, 1850.
In answer to many inquiries as to the practical effect of "Graham's Composition," I will state that I have used it in the boiler of the Steamboat Sunwick, which had become considerably incrustated with hard scale from both salt and fresh water. We used 10 lbs. per day, for three days, without blowing off the water until the fifth day, when all was drawn off. To our astonishment, we found the whole interior of the boiler as clear of scale and smooth as when it came from the hands of the maker. The following week, we tried the same quantity in a small steam tow boat. The boiler had old scale of long accumulation and very thick. We ran the boat three days without blowing off, and on the fourth day washed out the boiler and found it, like the "Sunwick's," perfectly clean and smooth as when new. I am therefore enabled to state that the use of the composition in these two instances under my own immediate observation and direction, has been attended with complete success.

JAMES MORROW,
Engineer Astoria Ferry



To Merchants, Railroad Companies, Machinists and Boiler Makers.

THE subscribers beg leave to call attention to their very large stock of Iron and Steel—of American, English, Swede and Norway make—of all the different kinds in use. Also, Railroad Iron, Ship, Boat and Railroad Spikes. They are also Agents for the Best Pennsylvania Locomotive Boiler and Tank Iron, each sheet of which will be stamped and warranted, at lowest mill prices. Our prices for all kinds of iron will be found very low, either for cash or approved credit.

BRINK & DURBIN, Philadelphia.

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Civil Engineer, Vicksburg, Miss.

Buckland, George,

Troy and Greenbush Railroad.

Clement, Wm. H.,

Little Miami Railroad, Cincinnati, Ohio.

Cozzens, W. H.,

Engineer and Surveyor, St. Louis, Mo.

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Fisk, Charles B.,

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Gzowski, Mr.,

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Grant, James H.,

Nashville and Chattanooga R. R., Nashville, Tenn.

S. W. Hill,

Mining Engineer and Surveyor, Eagle River, Lake Superior.

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Latrobe, B. H.,

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Worcester and Nashua Railroad, Worcester, Mass.

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Schnylkill Navigation, Schnylkill Haven, Pa.

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McRae, John,

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Ohio and Pennsylvania Railroad, Pittsburgh, Pa.

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South Side Railroad, Virginia.

Schlatter, Charles L.,

Northern Railroad (Ogdensburg), Malone, N. Y.

Sours, Peter,

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Panama Railroad—Address through office of Panama Railroad Co., 78 Broadway, N. Y.

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BUFFALO, N. Y.BY.....**FISK & SPERRY,**
Late of Delevan House, Albany.**J. D. Abraham, Architect,**NO. 300 MAIN STREET,
BUFFALO, N. Y.**Fountain Hotel,**LIGHT STREET, BALTIMORE,
P. THURSTON.....Proprietor.**DUNLAP'S HOTEL,**On the European Plan,
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BALTIMORE.

JOHN GUY. WILLIAM GUY.

American Hotel,Pratt street, opposite the Railroad Depot,
BALTIMORE.HENRY M. SMITH.....Proprietor.
Late of the Exchange & St. Charles Hotels, Pittsburg.**Washington Hotel,**BY JOHN GILMAN,
\$1 Per Day.
No. 206 Pratt street, (near the Depot),
BALTIMORE.**Barnum's City Hotel,**

MONUMENT SQUARE, BALTIMORE.

This Extensive Establishment, erected expressly for a Hotel, with every regard to comfort and convenience, is situated in the centre and most fashionable part of the city, and but a few minutes' walk from the Railroad Depots and Steamboat Landings.

The House has lately undergone a thorough repair, embracing many valuable improvements, and will accommodate 250 Guests. BARNUM & CO.

JONES' HOTEL,NO. 152 CHESTNUT STREET,
PHILADELPHIA.

BARNUM & WART, Proprietors.

BUSINESS CARDS.**Lithography.**

JOHN P. HALL & CO.,

161 Main st., Buffalo, (Commercial Advertiser Build.)

Are prepared to execute all kinds of Lithography in good style and at reasonable rates. Particular attention will be paid to Engraving Railroad Maps, Engineer's Plans and drafts, etc., and orders in this line are respectfully solicited.

J. T. Hodge

Will attend to the examination of mining tracts near Lake Superior, and prepare Reports and Maps.

Address, during the Summer,

[Ontanagon Postoffice, Lake Superior.

Cumberland Steam Coal,

FROM THE

FROSTBURG MINES, MD.

H. A. TUCKER,

Agent of Frostburg Coal Co.
No. 50 Wall Street, New York.**Eaton, Gilbert & Co.,**Railroad Car, Coach and Omnibus Builders,
TROY, N. Y.**Charles T. Jackson, M. D.,**

STATE ASSAYER, late Geologist to Maine, Rhode Island, New Hampshire, and the United States, offers his services to his friends and the public in making any Chemical, Mineralogical or Geological researches that may be required for the improvement of Agriculture and the Manufacturing Arts. Particular attention will be paid to the exploration of mines and to assaying of ores of the metals.

State Assayer's office, 31 Somerset st.
Boston Sept. 3, 1850.**STEEL AND FILES.****R. S. Stenton,**

20 CLIFF STREET, NEW YORK,

AGENT FOR

J. & RILEY CARR,BAILEY-LANE WORKS, SHEFFIELD,
Manufacturers of Cast, Shear, German, Bliet, and
Spring Steel,

Of all descriptions, Warranted Good.

FILES.

Manufacturers of Machinists' Warranted Best Cast Steel Files, expressly for working upon Iron and Steel, made very heavy for recutting.

A full Stock of Steel and Files at all times on hand. 6m4

Walter R. Johnson,

CIVIL AND MINING ENGINEER AND ATTORNEY for Patents. Office and Laboratory, F St., opposite the Patent office, Washington, D. C.

Dudley B. Fuller & Co.,IRON COMMISSION MERCHANTS,
No. 139 GREENWICH STREET,
NEW YORK.**Manning & Lee,**GENERAL COMMISSION MERCHANTS,
NO. 51 EXCHANGE PLACE,
BALTIMORE.

Agents for Avalon Railroad Iron and Nail Works, Maryland Mining Company's Cumberland Coal 'CED'—'Potomac' and other good brands of Pig Iron.

Samuel Kimber & Co.,COMMISSION MERCHANTS
WILLOW ST. WHARVES, PHILADELPHIA.AGENTS for the sale of Charcoal and Anthracite Pig Iron, Hammered Railroad Car and Locomotive Axles, Force Pumps of the most approved construction for Railroad Water Stations and Hydraulic Rams, etc., etc.
July, 27, 1849.**James Herron, Civil Engineer,**OF THE UNITED STATES NAVY YARD,
PENSACOLA, FLORIDA.,

PATENTEE OF THE

HERRON RAILWAY TRACK.

Models of this Track, on the most improved plan, may be seen at the Engineer's office of the New York and Erie Railroad.

PLUSHES

FOR

Railway Cars & Omnibuses.
F. S. & S. A. MARTINE,
 113 WILLIAM ST., NEAR JOHN.

ARE now receiving a large and complete assortment of Plain and Figured PLUSHES, of their own importation, which will be sold at the lowest market price, viz: Crimson, Maroon, Scarlet, Green, Blue, Purple, etc.

ALSO—CURLED HAIR, the best manufactured in market.

**To Railroad Companies,
 Machinists, Car Manufacturers, etc., etc.**

CHARLES T. GILBERT,
 NO. 90 BROAD ST., NEW YORK.

IS prepared to contract for furnishing at manufacturer's prices—
 Railroad iron,

Locomotive Engines,
 Passenger and Freight Cars,
 Car Wheels and Axles,
 Chairs and Spikes.

Orders are invited; and all inquiries in relation to any of the above articles will receive immediate attention.

**Manufacture of Patent Wire
 ROPE AND CABLES,**

For Inclined Planes, Suspension Bridges, Standing Rigging, Mines, Cranes, Derrick, Tilters, &c., by
JOHN A. ROEBLING, Civil Engineer,
TRENTON, N. J.

FORGING.

Ranstead, Dearborn & Co.,

MANUFACTURERS OF

LOCOMOTIVE CRANKS AND CAR AXLES,

ALSO

WROUGHT IRON SHAFTING,
 And All Kinds of Hammered Shapes.

Office 25 Foster's Wharf, Boston.

Henry I. Ibbotson,

IMPORTER of Sheffield and Birmingham Goods.
 Also, Agent for the Manufacture of Telegraph Wire.
 218 PEARL ST., NEW YORK.

**Cumberland, (Md.) Coals for
 Steaming, etc.**

ORDERS RECEIVED FOR AND FILLED
 by **J. COWLES, 27 Wall St., N. Y.**

Samuel D. Willmott,

MERCHANT, AND MANUFACTURER OF
 CAST STEEL WARRANTED SAWS, &
 —AND FILES—

IMPORTER OF THE
 GENUINE WICKESLY GRINDSTONES
 NO. 8 LIBERTY STREET,
 NEW YORK.

Railroad Instruments.

THEODOLITES, TRANSIT COMPASSES,
 and Levels, with Fraunhofers Munich Glasses,
 Surveyor's Compasses, Chains, Drawing Instruments,
 Barometers, etc., all of the best quality and
 workmanship, for sale at unusually low prices, by

E. & G. W. BLUNT,

No. 179 Water St., cor. Burling Slip.
 New York, May 19, 1849.

IRON.

Stickney & Beatty,
 DEALERS IN IRON AND IRON
 MANUFACTURERS.

AGENTS for the Balt. City Rolling Mill, from which establishment they are prepared to furnish Ellicott's round, square, and flat bar iron, puddled and charcoal boiler plates and billet iron—also agents for the sale of the Laurel, Gunpowder and Locust Grove (Balt.) forge pig irons, Locust Grove and Laurel Irons for car wheels, Caledonian boiler blooms made from cold blast iron, Old Colony and anti-Eaton nails, Wm. Jessop & Son's steel, Coleman's blister steel and nail rods, sheet, hoop, band, oval and common English iron.

No. 18 and 20 South Charles st., Baltimore.

Car Wheel Iron.

100 Tons "Columbia" No. 2 Cold Blast Charcoal Iron.

300 Tons "Salisbury" No. 1, do. do.

For sale by **CHARLES T. GILBERT,**

No. 80 Broad st.

New York, Sept. 21, 1850.

Railroad Spikes.

THE subscribers are prepared to make and execute contracts for Railroad Spikes of a superior quality, manufactured by the New Jersey Iron Company, at Boonton.

DUDLEY B. FULLER & CO.

139 Greenwich st. corner of Cedar.

Railroad Iron.

1650 Tons, weighing about 61 lbs. per yard, 40 tons, weighing about 52 lbs. per yard, and 825 tons, weighing about 53½ lbs. per yard, of the latest and most approved patterns of T rail, for sale by
BOORMAN, JOHNSTON & CO.,
 119 Greenwich street.

New York, Aug. 26, 1850.

N.B.—B. J. & Co are also prepared to take contracts for English rails, delivered in any of the Atlantic ports of the United States.

Railroad Iron.

THE Undersigned, Agents for Manufacturers, are prepared to contract to deliver Rails of superior quality, and of any size or pattern, to any ports of discharge in the United States.

COLLINS, VOSE & CO.

74 South St.

New York, June 1, 1850.

Railroad Iron.

1,500 Tons weighing 55 lbs. per lineal yard.

500 " " 57 " "

500 " " 56 " "

500 " " 60 & 61 lbs. "

Also 2½ ft flat rails. All the above being of approved patterns. For sale by

DAVIS, BROOKS, & CO.,

68 Broad street.

N.B.—Rails imported on commission, or at a fixed price.

Iron.

Pig Iron, Anthracite and Charcoal; Boiler and Flue Iron, Spring and Blistered Steel, Nail Rods, Best Refined Bar Iron, Railroad Iron, Car Axles, Nails, Stove Castings, Cast Iron Pipes of all sizes, Railway Chairs of approved patterns for sale by

COLEMAN, KELTON & CAMPBELL,

109 N. Water St., Philadelphia.

Railroad Iron.

THE UNDERSIGNED, HAVING made arrangements abroad, are prepared to contract for the delivery of Foreign rails, of approved brands upon the most favorable terms.

They will also make contracts for American rails, made at their Trenton works, from Andover Iron, in whole or in part, as may be agreed upon.

They are prepared to furnish Telegraph, Spring and Market Wire; Braziers and Wire Rods; Rivets and Merchant Bars to order, all made exclusively from Andover Iron. The attention of parties who require iron of the very best quality for special purposes, is respectfully invited.

COOPER & HEWITT,

17 Burling Slip, New York.

February 15, 1850.

Railroad Iron.

THE Undersigned, Agents for Manufacturers, are prepared to contract for the delivery of English, Welsh and Scotch Rails, of any pattern and weight, also for every description of English, Welsh, Scotch, and Swedish Iron, Railway Chairs and Spikes, Rivets, Bolts, Nuts, Washers, Chain Cables, Anchors, Tin Plates, German Spelter, Iron Castings, and every description of Machinery.

WILLIAM BIRD & CO.,

Iron and Tin Plate Merchants,

44 Wall st., New York.

And at 5 Martin's Lane, City, London,

and 140 Buchanan st., Glasgow.

July 27th, 1850.

Railroad Iron.

THE Undersigned are prepared to contract for the delivery of superior make Welsh Railroad Iron of the favorite brand "Aberdare."

JOSEPH BRAMWELL & CO.,

40 " " " 91 Wall street.

Glendon Refined Iron.

Round Iron, Band Iron, Hoop Iron,
 Square " Flat " Scroll "

Axles, Locomotive Tyres,
 Manufactured at the Glendon Mills, East Boston, for
 sale by **GEORGE GARDNER & CO.,**

5 Liberty Square, Boston, Mass.

Sept. 15, 1849.

3m37

PATENT HAMMERED RAILROAD, SHIP & BOAT SPIKES.—The Albany Iron Works have always on hand, of their own manufacture, a large assortment of Railroad, Ship and Boat Spikes from 2 to 12 inches in length, and of any form of head. From the excellence of the material always used in their manufacture, and their very general use for rail roads and other purposes in this country, the manufacturers have no hesitation in warranting them fully equal to the best spikes in market, both as to quality and appearance. All orders addressed to the subscribers at the works will be promptly executed.

JOHN F. WINSLOW, Agent.

Albany Iron and Nail Works, Troy, N. Y.

The above Spikes may be had at first-class prices, of Erastus Corning & Co Albany; Meritt & Co., New York; E. Pratt & Brother, Eastmore Md.

**LAP—WELDED
WROUGHT IRON TUBES**

FOR

TUBULAR BOILERS,
 FROM ONE AND A QUARTER TO SEVEN
 INCHES IN DIAMETER.

THE ONLY Tubes of the same quality and manufacture as those so extensively used in England, Scotland, France and Germany, for Locomotive, Marine and other Steam Engine Boilers.

THOMAS PROSSER & SON, Patentees,
 28 Platt street, New York.

Railroad Iron.

THE UNDERSIGNED ARE PREPARED TO contract for the delivery of English Railroad Iron of favorite brands, during the Spring. They also receive orders for the importation of Pig, Bar, Sheet, etc. Iron.

THOMAS B. SANDS & CO.,
 73 New street,
 New York.

February 3, 1849.

Iron Store.

THE Subscribers, having the selling agency of the following named Rolling Mills, viz: Norristown, Rough and Ready, Kensington, Triadelphia, Pottsgrove and Thorndale, can supply Railroad Companies, Merchants and others, at the wholesale mill prices for bars of all sizes, sheets cut to order as large as 58 in. diameter; Railroad Iron, domestic and foreign; Locomotive tire welded to given size; Chairs and Spikes; Iron for shafting, locomotive and general machinery purposes; Cast, Shear, Blister and Spring Steel; Boiler rivets; Copper; Pig iron, etc., etc.

MORRIS, JONES & CO.,

Iron Merchants,

Schuylkill 7th and Market Sts., Philadelphia.
 August 16, 1849. 1y33

Railroad Iron.

THE MOUNT SAVAGE IRON WORKS, Alleghany county, Maryland, having recently passed into the hands of new proprietors, are now prepared, with increased facilities, to execute orders for any of the various patterns of Railroad Iron. Communications addressed to either of the subscribers will have prompt attention.

J. F. WINSLOW, President

Troy, N. Y.

ERASTUS CORNING, Albany

WARREN DELANO, Jr., N. Y.

JOHN M. FORBES, Boston.

ENOCH PRATT, Baltimore, Md.

November 6, 1848.

Railroad Iron.

THE SUBSCRIBERS ARE PREPARED TO take orders for Railroad Iron to be made at their Phoenix Iron Works, situated on the Schuylkill River, near this city, and at their Safe Harbor Iron Works, situated in Lancaster County, on the Susquehanna river; which two establishments are now turning out upwards of 1800 tons of finished rails per month.

Companies desirous of contracting will be promptly supplied, with rails of any required pattern, and of the very best quality.

REEVES, BUCK & CO.

45 North Water St. Philadelphia;

March 15, 1849.

Tredgar Iron Works.

ROLLING MILL FOUNDRY AND MACHINE SHOPS. The undersigned continues to manufacture at his Works in this city (from best charcoal metal) Bar Iron of every description, embracing—Rounds and Squares, from $\frac{1}{4}$ to 5 inches diameter. Flats, from $\frac{1}{4}$ to 7 inches, all thicknesses. Bands and Scrolls, all sizes. Boiler plate and Plough Iron. Railroad and Locomotive Axles and Tires. Locomotive Frames, Spikes and Plates. Hoops, Ovals, Half Ovals, Half Rounds, Angle, T. L., and indeed every description of Iron usually manufactured, all of which he warrants to be equal to any made in this country. He also manufactures at his Foundry and Machine Shops all descriptions of Railroad Work, say, Locomotives, Railroad Wheels and Axles complete and ready for the road, Railroad Chairs, etc. Also, Marine and Stationary Engines all sizes, Sugar mills and Engines, Horse mills, and every kind of Machinery usually required for the operations of the country. He has paid particular attention to getting up machinery, etc., for Gold Mine operations, and those in want of such work might find it to their advantage to give him a call.

J. R. ANDERSON.
Richmond, Va., Sept. 10, 1850.

CUT NAILS OF BEST QUALITY, BAR IRON (including Flat Rails) manufactured and for sale by **FISHER, MORGAN & CO.,**
75 N. Water St., Philadelphia.

Wheel, Forge and Foundry Iron.

LOCUST GROVE Wheel Iron of great strength and superior chilling property.
Balt. Charcoal Forge Iron, from Patuxent, Curtis Creek and Gunpowder furnaces.
Elkridge Foundry Iron, of superior strength and softness. Anthracite and Charcoal Iron from Pennsylvania and Virginia. Gas and Water Pipes, Lamp Posts from Elkridge furnace.

LEMMON & GLENN,
2nd 62 Buchanan's Wharf, Baltimore.

S. S. Keyser & Co.,
IRON WAREHOUSE,
Corner of South and Pratt Streets,
BALTIMORE, MD.

Selling Agents for the Rough and Ready Bar Iron and Elk Boiler and Flue Iron Rolling Mills, Sarah and Taylor Furnaces, and Wrightsville Hollow Ware Foundry, and Dealers in Bar and Sheet Iron, and Cast, Sheer, German, Blister, Spring and Electroplated Steel, etc., etc.

Smith & Tyson,

GENERAL COMMISSION MERCHANTS,
No. 25 South Charles St., Baltimore, Md.
AGENTS for the Celebrated Columbia Pig Iron, suitable for Car Wheels and Chilled Rolls.
Columbia refined Charcoal Blooms; Refined Charcoal Juniata Billet Iron for Wire; Refined Iron for Bridging, of great strength; Cut Nails, Spikes, and Brads; Railroad Spikes and Wrought Chairs. 22tf

Railroad Iron.

CONTRACTS made by the subscribers, agents for the manufacturers, for the delivery of Railway Iron, at any port in the United States, at fixed prices, and of quality tried and approved for many years, on the oldest railways in this country.

RAYMOND & FULLERTON, 45 Cliff st.

JOHNSON, CAMMELL & Co's
Celebrated Cast Steel,

AND
ENGINEERING AND MACHINE FILES, which for quality and adaptation to mechanical uses, have been proved superior to any in the United States. Every description of square, octagon, flat and round cast steel, sheet, shovel and railway spring steel, best double and single shear steel, German steel, flat and square, goat stamps, etc. Saw and file steel, and steel to order for any purposes, manufactured at their Cyclops Steel Works Sheffield.

JOHNSON, CAMMELL & CO.,
100 William St., New York.

November 23 1849.

Bowling Tire Bars.

40 Best Flange Bars $5\frac{1}{2} \times 2$ inches, 11 feet long.
40 " " $5\frac{1}{2} \times 2$ " 7 feet 8 in. long.
40 " Flat " 6×2 " 11 feet long.
40 " " 6×2 " 7 feet 8 in. long.

Now in store and for sale by
RAYMOND & FULLERTON,
45 Cliff street.

IRONDALE PIG METAL, MANUFACTURED
and for sale by the Bloomsburg Railroad Iron Co.
LINDLEY FISHER, Treasurer.
75 N. Water St., Philadelphia.

Railroad Iron.

2000 Tons, weighing 58 pounds per lineal yard, of the most approved pattern of T rails, in store and to arrive, for sale by
COLLINS, VOSE & CO.,
74 South St.

New York, June 1, 1850.

Railroad Iron.

3,000 TONS C. L. MAKE 63 $\frac{1}{2}$ lbs. per yard, now landing and to arrive.

Also contracts made for future delivery of above superior make English Iron.
300 Tons Banks Best Iron, Round, Square and Flat.
200 " English Bar " " " "
10 " 9-15 Square Iron for Railroad Spikes.

For sale in lots to suit purchasers by
DAVID W. WETMORE.
New York, March 26, 1850. 3m

WILLIAM JESSOP & SONS'
CELEBRATED CAST-STEEL.

The subscribers have on hand, and are constantly receiving from their manufactory.

PARK WORKS, SHEFFIELD,

Double Refined Cast Steel—square, flat and octagon.
Best warranted Cast Steel—square, flat and octagon.
Best double and single Shear Steel—warranted.
Machinery Steel—round.

Best and 2d gy. Sheet Steel—for saws and other purposes.

German Steel—flat and square, "W. I. & S." "Eagle" and "Goat" stamps.

Genuine "Sykes," L Blister Steel.
Best English Blister Steel, etc., etc., etc.

All of which are offered for sale on the most favorable terms by
WM. JESSOP & SONS,
91 John street, New York.

Also by their Agents—

Curtis & Hand, 47 Commerce street, Philadelphia.
Alex'r Fullerton & Co., 119 Milk street, Boston.
Stickney & Beatty, South Charles street, Baltimore.
May 6, 1849.

Railroad Iron.

B. O. Railway Tires, Railway Wheels,
Scotch Pig Iron, Tin Plates and Banca Tin,
Muntz Patent Metal Sheathing,
Baltimore Copper.

Contracts for Rails made on behalf of the manufacturers, for delivery at any ports in the United States, at fixed prices.

Bowling Tires and Tire Bars and Scotch Pigs imported to order.

Muntz's Ship-sheathing, and a general stock of Tin Plates and Banca Tin in store, and for sale by
RAYMOND & FULLERTON, 45 Cliff st.

Bowling Iron. Stamped B.O.

Railway Tire Bars Rivet Iron
Locomotive and other Axles Locomotive Frame do
Boiler Plates Bars,
and every other description of this superior Iron.

The subscribers, agents for the sale of Bowling Iron, are prepared to execute orders for importation, especially for railway and machinery uses, with despatch from the manufacturers.

RAYMOND & FULLERTON, 45 Cliff st.

Lovegrove's Patent Cast Iron
Water and Gas Pipes.

THE Subscriber, the Inventor and Patentee of the Centrifugal mode of giving form to metallic substances while in a molten state, is preparing to make Cast Iron Water and Gas Pipes, of any dimensions, at prices much lower than they can be made in the old manner, and the pipes warranted to stand a pressure of three hundred pounds to the square inch, and to be soft enough to drill. Steam Engines and all kinds of machinery. Cast Iron Doors and Frames, and Mill Castings of every description, made to order.

THOMAS J. LOVEGROVE,

Machinist and Founder,

West Falls Avenue, below Pratt st., Baltimore.

Railroad Iron.**SPIKES.**

Wrought Iron CHAIRS, New Pattern.

THE Undersigned continues to contract, as usual, for the above articles. The reputation already acquired for their excellent quality is a guarantee that strict attention shall continue to be paid to the wants and interests of purchasers.

CHARLES ILLIUS,
20 Beaver St., New York.

Ray's Patent India Rubber
Car Springs.

Savannah, Ga., May 22, 1850.

FOWLER M. RAY, Esq.,
Dear Sir: I have no hesitation in saying, after having used on our road your springs and Fuller's, that I consider yours decidedly the best in every particular, and in this opinion I am sustained by all our officers. Fuller's spring has a tendency to split, and also to chafe or abrade by the constant friction on the cast iron plates or disc: and in my opinion is not near so elastic as yours.

Your springs, which have been in use on our road for 12 or 15 months past, and in constant use under both passenger and freight cars, are to all appearances as elastic, sound and good, as when first put in use.

We are now building eighty-five new cars, of which for fifty-sets the springs have been ordered of you.

GEORGE A. ADAMS,

Master Carpenter,

Central Railroad and Banking Co. of Georgia.

Connecticut River Railroad Office, }
Northampton, May 4, 1850. }

E. CRANE, Esq.,
Dear Sir: It is now about two years since I first tried the experiment of using a set of Ray's India-rubber Springs upon one of our merchandise cars, and although the car has been in constant service since that time, I do not on examination find the slightest difference either in the thickness or elasticity of the material.

The same result has followed wherever we have applied them, either for wheel or draw springs on Engines, Tenders or Cars. At present we use no other; either in replacing old springs or building new cars—and I am perfectly satisfied that for economy, durability, safety, and ease of motion, that Ray's India-rubber is the best article for Springs which has been presented to the public.

Yours respectfully, **J. HUNT,**
Supt. Connecticut River Railroad.

EDWARD CRANE, Esq.,
Dear Sir: Having applied to cars of the Boston and Worcester Railroad Corporation, Ray's Vulcanised Rubber Springs (where they have been in use for some two years last past), I have had occasion to observe their operation, and am free to say in answer to your inquiries, that they retain their elasticity perfectly during all changes of atmospheric temperature; and are in my opinion a most valuable acquisition to Railroad Cars—are not liable to derangement, as is the case with steel springs; while at the same time it costs less to apply them. Respectfully yours,

D. N. PICKERING,
Supt. Motive Power, Bost. & Wor. Railroad.
Boston, April 15th, 1850.

EMERSON'S**PATENT****CORRESPONDING VENTILATORS,**

For Ships, Steamers, etc.,

Manufactured by

CHILSON, ALLEN, WALKER & CO.,
351 Broadway, New York.

TO RAILROAD COMPANIES, CAR MANUFACTURERS, etc.

THE Undersigned hereby gives public notice, that the Commissioner of Patents, pursuant to his decision in relation thereto, on the 8th day of October, 1850, issued to him a Patent for the sole right to manufacture, and exclusive use of the **INDIA RUBBER CAR SPRING**, on account of priority of invention of said Spring.

F. M. RAY
New York, Oct. 23, 1850.

RAILROAD CAR MANUFACTORY

TRACY & FALES,

GROVE WORKS, HARTFORD, CONN.

Passage, Freight and all descriptions of

RAILROAD CARS,

AS WELL AS

LOCOMOTIVE TENDERS,

Made to order promptly.

The above is the Largest Car Factory in the Union. In quality of Material, and in Workmanship, Beauty and Good Taste, as well as Strength and Durability, we are determined our work shall be unsurpassed.

JOHN R. TRACY. THOS. J. FALES.

Monument Foundry.
A. & W. DENMEAD & SON,
 Corner of North and Monument Sts.,—Baltimore,
 HAVING THEIR
IRON FOUNDRY AND MACHINE SHOP
 In complete operation, are prepared to execute
 faithfully and promptly, orders for
 Locomotive or Stationary Steam Engines,
 Woolen, Cotton, Flour, Rice, Sugar Grnt, or Saw
 Mills,
 Slide, Hand or Chuck Lathes,
 Machinery for cutting all kinds of Gearing.
 Hydraulic, Tobacco and other Presses,
 Car and Locomotive patent Ring Wheels, war-
 ranted,
 Bridge and Mill Castings of every description,
 Gas and Water Pipes of all sizes, warranted,
 Railroad Wheels with best faggotted axl, fur-
 nished and fitted up for use, complete
 Being provided with Heavy Lathes for Bor-
 ing and Turning Screws, Cylinders, etc., we can
 furnish them of any pitch, length or pattern.
 Old Machinery Renewed or Repaired—and
 Estimates for Work in any part of the United States
 furnished at short notice.
 June 8, 1849.

**RAILROAD CAR
 AND COACH TRIMMINGS.**
Doremus & Nixon,
 IMPORTERS AND FURNISHERS

HAVE FOR SALE
 Plain Garnet Plush. Fig. Garnet Plush (Butterfly pat.
 "Crimson " "Crimson " (Elegan.
 "Scarlet " " " (Gen. Tylor.

BROCATELLES.
 Crimson Silk Brocatelles. Gold and Maroon to.
 Gold and Blue " " Brown
 Silk and Wool " of every color.

MOQUETTS,
 Of elegant designs and colors.
GERMAN CLOTH FOR CAR LININGS.
 The most beautiful goods ever shown in this coun-
 try, and the subscribers are the sole agents for the sale
 of them.

Oil cloths Enamelled with Gold. These goods can be
 "Silver " furnished in any
 Do. Silver ground velvet printed. dimensions req'd.

CURLED HAIR
 Of every description and quality.

JNO. W. A. STRICKLAND, Agent.
 New York, 1850. 1716

**FOWLER M. RAY'S
 Patent India-rubber Railroad
 CAR SPRING.**

New York and Erie Railroad Shops.
 Piermont, March 26, 1850.

This will certify that from practical experience in
 the use of Fowler M. Ray's India Rubber Car Springs,
 I believe them to be far superior to any others now in
 use.

I have never known them to be affected by any
 change of temperature, as other Rubber Springs have
 been affected on this road.

I am at the present time repairing a Passenger Car
 that Mr. Ray and myself mounted with his springs
 about two years and eight months since.

The springs are at the present time as perfect, to all
 appearances, as when first applied to the car.

Respectfully yours,
HORACE B. GARDNER,
 Foreman of the Car Shops.

Supt. Office N.Y. & H. R.R. }
 New York, March 8, 1850.

This is to certify that we have used the Rubber
 Springs manufactured by Mr. F. M. Ray for the past
 twenty months, "both for Passenger and Freight Car
 Springs and Bumpers, and of different sizes," and
 have in every case given entire satisfaction, and I con-
 sider them the best spring now in use

M. SLOAT, Supt.
 Boston, March 5, 1850.

In answer to your enquiry about India-rubber
 Springs, I have to say that we have used them to a
 considerable extent on both freight and passenger cars,
 and also on several of our tenders; and I am very
 well satisfied that they answer all the purposes for
 which they are intended. I believe the India-rubber
 will soon supersede all other springs for cars and ten-
 ders.
 Yours truly,
S. M. FELTON,
 Supt. Fitchburg Railroad.

Office New Jersey Railroad Co., }
 Jersey City, March 8, 1850. }

FOWLER M. RAY, Esq.,
 Dear Sir: In answer to your enquiries respecting
 the operation of the Vulcanised Rubber Springs, pur-
 chased by our company from you some two years
 since. I reply that they are superior to any spring in
 use, (that I have either seen or heard of).

The improved form of your spring, consisting of a
 solid piece of vulcanised rubber with bands on the out-
 side, is far superior to your first form, consisting of
 disks of rubber with metallic plates interposed.

The last named form was tried, if you recollect, at a
 much earlier period; and then was replaced by your
 last form.

I have no hesitation in saying that your springs
 have given entire satisfaction, and most cheerfully re-
 commend them to railroad companies throughout the
 country for the following reasons:

- 1st. The cost is 30 per cent. less.
- 2d. Saving of weight on each car of 8 wheels from
 700 to 800 lbs.
- 3d. Less care and attention is required, as they are
 not liable to get out of repair.
- 4th. A great saving is secured in the wear and tear
 of the cars and rails from their great elasticity.
- 5th. The freedom from noise.
- 6th. There is greater safety in case of accident, as
 they cannot be broken.
- 7th. The comfort of passengers is enhanced suffi-
 ciently to pay the expense, waiving all the other rea-
 sons that I have given.

Should this fail to satisfy any person enquiring, you
 are at liberty to refer to me, No. 150 Washington St.,
 Jersey City. Yours respectfully,

T. L. SMITH, Supt.

New York, March 11, 1850.

I have used the Patent India-rubber Spring pur-
 chased of Mr. Ray, upon the cars of the New York
 and New Haven Railroad, and have found them effi-
 cient and economical; and when applied to the axles
 and draw springs, believe them to be quite equal to
 any in use. I have found a combination of these
 springs with a steel spring under the transom beam a
 very satisfactory arrangement, and am now using this
 plan in all new cars.

Yours respectfully,
ROBERT SCHUYLER.

February 25, 1850.

From practical observation of the use of the India-
 rubber Car Springs, manufactured and sold by your
 company, we are entirely satisfied in their application,
 and do not hesitate to recommend them as elastic, du-
 rable, requiring no repairs for years, and retaining
 their consistency during all extremes of weather. We
 have applied them for the past two years, and consid-
 er them superior for all railroad purposes.

Yours truly,
OSGOD BRADLEY, Car Builder, Worcester.
T. & C. WASON, do. Springfield.
DEAN, PACKARD & MILLS, do. do.
DAVENPORT & BRIDGES, do. Cambridgeport.

Office of the New Jersey Railroad Co., }
 Jersey City, March 7, 1850. }

This is to certify that we have had Mr. F. M. Ray's
 India-rubber Springs in constant use under our cars,
 and as Bumper Springs for upwards of two years, and
 they have in every way given perfect satisfaction.

The present form of spring we deem far superior to
 the form of Disk, having used both forms, although
 we have none of those made in Disks at present in use.

We take pleasure in recommending these springs to
 all railroad companies.

J. P. JACKSON, Vice Prest.
 New Jersey Railroad and Trans. Co.

Roanoke, February 28, 1850.

In compliance with your request, I take great plea-
 sure in stating the result of my experience in the use
 of "Ray's Patented Vulcanized India-rubber Car and
 Engine Springs." We have used them nearly two
 years, and never had one fail in any way. The cold
 weather does not affect them, as it has other rubber
 springs we have used.

With sixteen years' experience as superintendent of
 machinery on the Boston and Providence railroad, I
 take pleasure in saying that your springs are the best
 we ever used, or I ever saw used elsewhere. We have
 20 cars rigged with them, of which I can say that the
 springs are as good now as when first applied. I put
 24 lbs. of the rubber under the forward end of one of
 our heaviest engines, taking off 250 lbs. of steel springs
 —it has been in use 18 months, and is in as good con-
 dition now as when first put under the engine.

Very respectfully yours,
GEO. S. GRIGGS,
 Supt. of Machinery, Boston and Prov. R.R.

Fall River, February 2, 1850.
 In answer to yours of the 20th ult. I would say that
 this company has for some 10 or 12 months past been
 using "Ray's India-rubber Springs." We have an-
 nlt of them to both passenger and freight cars with
 uniform success. They have invariably preserved
 their elasticity and consistency through all the ex-
 tremes of weather; and we are now applying them
 whenever the steel spring fails. I am well satisfied
 that they are particularly adapted for railroad purposes.

Very respectfully yours,
GEO. HAVEN,
 Supt. Fall River Railroad.

Jersey City, March 9, 1850.

This is to certify that the present form of Mr. F.
 M. Ray's India-rubber Car Spring I consider far su-
 perior to the form of Disk, having used both forms.

I take pleasure in recommending these springs to all
 railroad companies. **DAVID H. BAKER,**
 Foreman of Car Shop of N.J. R.R. & Trans. Co.

Harlem R.R. Depot, }
 New York, March 7, 1850. }

This is to certify that we have used Mr. F. M. Ray's
 India-rubber Springs for over eighteen months, and
 find them to be easy and durable, and recommend them
 to railroad companies as being superior to anything we
 have tried.

J. M. SMART,
 Foreman at 42d St. Depot.

Old Colony Railroad Office,
 Boston, March 6, 1850.

EDWARD CRANE, Esq.,
 President New England Car Co.,

Dear Sir: In compliance with your request I would
 state that the Old Colony Railroad Comp'y have had
 in use upon their road, India-rubber Springs furnish-
 ed by your company, for more than eighteen months
 past, during which time they have been extensively
 used under Passenger and Freight Cars, Locomotive
 Tenders, and for Drawer and Buffing Springs, with
 the most perfect success. The elasticity and consis-
 tency of the Rubber has never been unfavorably affect-
 ed by either extremes of heat or cold—and from the
 experience which we have had in the use of Rubber
 Springs, I think them well adapted for railroad pur-
 poses—and therefore we have for some months past
 used Rubber almost exclusively, in all places where
 springs are required.

Respectfully yours, etc.,
JAS. H. MOORE,
 Supt. O. C. Road.

Troy, February 27, 1850.

We have been using your India-rubber Car Springs
 for nearly two years—and we take pleasure in saying
 that in our opinion the rubber has to a certain extent
 already, and may eventually entirely supersede all
 other Springs for Railroad Car purposes. We now
 use it entirely for Draw Springs and Bumpers, con-
 sidering it better and lighter than steel.

During our two years' experience in the use of it,
 we have not known any to lose their elasticity, or fail
 in any way; and we cheerfully recommend the rub-
 ber for railroad car springs. Very respectfully,
EATON, GILBERT & CO.

Passenger Car Linings.

THE Advertiser continues to make to order the
 Enamelled Car Linings which have been so high-
 ly approved the last three years, and are now exclu-
 sively used by all the Northern Railroads. No pains
 are spared to get out new styles, and adapt them to
 the tastes of every consumer.

Orders addressed to **CHARLES STODDER, No.**
 75 Kilby street, Boston, will have prompt attention.
 March 23, 1850. 2m

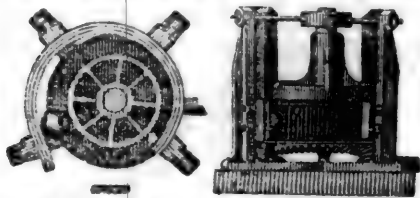
India-rubber for Railroad Cos.

**RUBBER SPRINGS—Bearing and Buffer—Ful-
 ler's Patent—Hose from 1 to 12 inches diameter.**
 Suction Hose. Steam Packing—from 1-16 to 2 in.
 thick. Rubber and Gutta Percha Bands. These ar-
 ticles are all warranted to give satisfaction, made un-
 der Tyer & Helm's patent, issued January, 1849.—
 No lead used in the composition. Will stand much
 higher heat than that called "Goodyear's," and is in
 all respects better than any in use. Proprietors of rail-
 roads do not be overcharged by pretenders.

HORACE H. DAY,
 Warehouse 23 Courtlandt street.
 New York, May 21, 1849.

Spikes, Spikes, Spikes.

ANY person wishing a simple and effective Spik-
 e Machias, or a number of them, may be supplie
 by addressing **J. W. FLACK,**
 March 6, 1850. Troy, N. Y.

MACHINERY.**Henry Burden's Patent Revolving Shingling Machine.**

THE Subscriber having recently purchased the right of this machine for the United States, now offers to make transfers of the right to run said machine, or sell to those who may be desirous to purchase the right for one or more of the States.

This machine is now in successful operation in ten or twelve iron works in and about the vicinity of Pittsburgh, also at Phoenixville and Reading, Pa., Covington Iron Works, Md., Troy Rolling Mills, and Troy Iron and Nail Factory, Troy, N. Y., where it has given universal satisfaction.

Its advantages over the ordinary Forge Hammer are numerous: considerable saving in first cost; saving in power; the entire saving of shingler's, or hammerman's wages, as no attendance whatever is necessary, it being entirely self-acting; saving in time from the quantity of work done, as one machine is capable of working the iron from sixty puddling furnaces; saving of waste, as nothing but the scoria is thrown off, and that most effectually; saving of staffs, as none are used or required. The time required to furnish a bloom being only about six seconds, the scoria has no time to set, consequently is got rid of much easier than when allowed to congeal as under the hammer. The iron being discharged from the machine so hot, rolls better and is much easier on the rollers and machinery. The bars roll sounder, and are much better finished. The subscriber feels confident that persons who will examine for themselves the machinery in operation, will find it possesses more advantages than have been enumerated. For further particulars address the subscriber at Troy, N. Y.

P. A. BURDEN.

Railroad Spikes and Wrought Iron Fastenings.

THE TROY IRON AND NAIL FACTORY, exclusive owner of all Henry Burden's Patented Machinery for making Spikes, have facilities for manufacturing large quantities upon short notice, and of a quality unsurpassed.

Wrought Iron Chairs, Clamps, Keys and Bolts for Railroad fastenings, also made to order. A full assortment of Ship and Boat Spikes always on hand.

All orders addressed to the Agent at the Factory will receive immediate attention.

P. A. BURDEN, Agent,
Troy Iron and Nail Factory, Troy, N. Y.

CHILLED RAILROAD WHEELS.—THE Undersigned are now prepared to manufacture their Improved Corrugated Car Wheels, or Wheels with any form of spokes or discs, by a new process which prevents all strain on the metal, such as is produced in all other chilled wheels, by the manner of casting and cooling. By this new method of manufacture, the hubs of all kinds of wheels may be made whole—that is, without dividing them into sections—thus rendering the expense of banding unnecessary; and the wheels subjected to this process will be much stronger than those of the same size and weight, when made in the ordinary way.

A. WHITNEY & SON,
Willow St., below 13th,
Philadelphia, Pa.

Brown's Old Established SCALE WARE HOUSE,

NO. 234 WATER ST., NEW YORK.

THE Subscriber, Practical Manufacturer of Scales of every description, respectfully asks the attention of Railroad Companies to his Improved Wrought Iron Railroad Track and Depot Scales which for strength, durability, accuracy, convenience in weighing, and beauty of workmanship, are not surpassed by any others in this country.

He is aware that this is rather a bold assertion for him to make, yet he can say with confidence that they have but to be tried to give them precedence over all others.

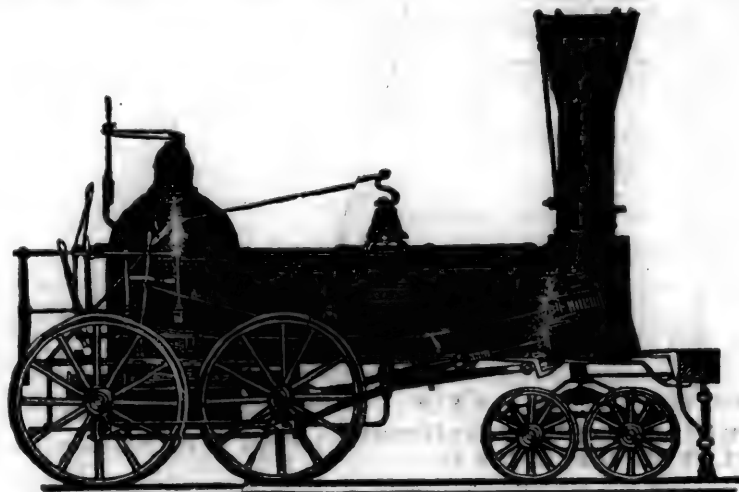
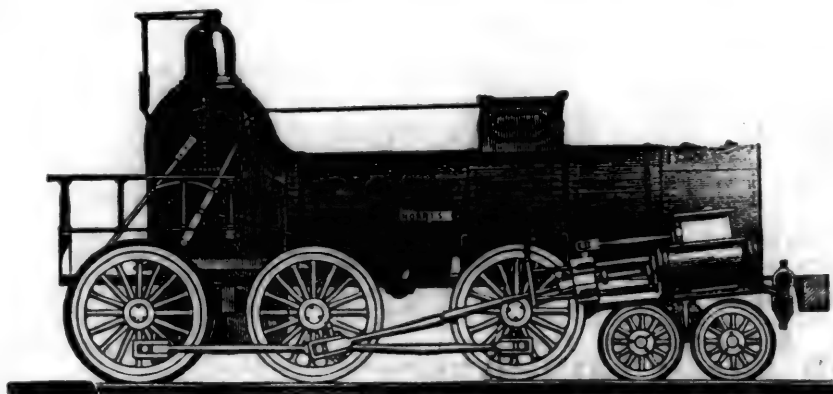
J. L. BROWN.

Bank Scales made to order, and all Scales of his make Warranted in every particular.

Reasons given if required.

NORRIS' LOCOMOTIVE WORKS.

BUSHHILL, SCHUYLKILL SIXTH-ST., PHILADELPHIA,



THE UNDERSIGNED Manufacture to order Locomotive Steam Engines of any plan or size. Their shops being enlarged, and their arrangements considerably extended to facilitate the speedy execution of work in this branch, they can offer to Railway Companies unusual advantages for prompt delivery of Machinery of superior workmanship and finish.

Connected with the Locomotive business, they are also prepared to furnish, at short notice, Chilled Wheels for Cars of superior quality.

Wrought Iron Tyres made of any required size—the exact diameter of the Wheel Centre, being given, the Tyres are made to fit on same without the necessity of turning out inside.

Iron and Brass castings, Axles, etc., fitted up complete with Trucks or otherwise.

NORRIS, BROTHERS

PATENT MACHINE MADE HORSE-SHOES.

The Troy Iron and Nail Factory have always on hand a general assortment of Horse Shoes, made from Refined American Iron.

Four sizes being made, it will be well for those ordering to remember that the size of the shoe increases as the numbers—No. 1 being the smallest.

P. A. BURDEN, Agent,
Troy Iron and Nail Factory, Troy, N. Y.

Etna Safety Fuse.

THIS superior article for igniting the charge in wet or dry blasting, made with DUPONT'S best powder, is kept for sale at the office and depot of

REYNOLDS & BROTHER,

Sole Manufacturers,
No. 85 Liberty St.,
NEW YORK.

And in the principal cities and towns in the U. States.

The Premium of the AMERICAN INSTITUTE was awarded to the Etna Safety Fuse at the late Fair held in this city.

November 3, 1849.

ly

COLUMBUS, OHIO, Railroad Car Manufactory. RIDGWAYS & KIMBALL,

HAVE established at this central point, the manufacture of Passenger, Freight, Gravel and Hand Cars for Railroads, and assure all Western Railroad Companies that it will be their constant aim to procure the best materials and workmen, and to turn out the best kind of work at fair prices. Specimens may be seen on the Columbus and Xenia Railroad. The patronage of Railroad Companies is respectfully solicited.

ly8

FOR SALE.

THREE LOCOMOTIVES, Manufactured by M. W. Baldwin, of 10 tons weight, all in complete repair, and now running on the Columbia and Philadelphia Railroad.

For particulars apply to A. L. Roumfort, Supt. of said road, either at Philadelphia, or Parkersburg, Chester county.

A. L. ROUMFORT,
Supt. Motive Power Col. & Philad. R.R.

AMERICAN RAILROAD JOURNAL.

STEAM NAVIGATION, COMMERCE, MINING, MANUFACTURES.

HENRY V. POOR, Editor.

ESTABLISHED 1831.

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ASSISTANT EDITORS,

J. T. HODGE, *For Mining and Metallurgy.*
GEN. CHAS. T. JAMES, *For Manufactures and the Mechanic Arts.*

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American Railroad Journal.

PUBLISHED BY J. H. SCHULTZ & Co., 136 NASSAU ST.

Saturday, December 7, 1850.

For the American Railroad Journal.

Important Railroad Decision.

Maryland Mining Company versus Mount Savage Iron Company.

In Alleghany County Court, State of Maryland, before the Honorable Robert N. Martin, Chief Justice, and R. H. Marshall and D. Weisel, Associate Justices.

This case, decided by Alleghany County Court, at its last term, is one of great importance, on account of the interesting questions of law decided by it. The facts upon which the opinion of the court was given were briefly these. The Maryland Mining Company, by its charter, passed by the Legislature of Maryland on the 25th day of March, 1836, was authorized to construct a railroad from its mines, near Frostburg, to the canal basin, at or near the town of Cumberland, and for that purpose was vested with the power to condemn lands for the use of its road, by a jury summoned by the Sheriff for that purpose.

The Maryland and New York Iron and Coal Company was also chartered by the Legislature of Maryland on the 12th day of March, 1838, with power also to construct a railroad from its works to the canal basin at or near Cumberland; and for that purpose to make condemnation of land, by a jury, in the usual form. By a clause in the charter of both companies they were both prohibited from occupying any land that might be wanted for the main route of the Baltimore and Ohio road or for the Chesapeake and Ohio Canal.

Neither company commenced to make their roads for several years after the charters were granted, but the Maryland and New York Iron and Coal Company commenced its road in the latter part of the year 1843; and upon the 16th January, 1844, in pursuance of its charter, had a warrant of condemnation issued and executed for the purpose of condemning a right of way for its road through the "Narrows," so called from the fact that it is a narrow pass between two precipitous mountains. This condemnation embraced an average width of ninety feet. The company then went on to construct its road, without any remonstrance on the part of the Maryland Mining Company, or any assertion of its right to a priority of choice in the location of the site for its road, or making any objection to the condemnation of the land or the construction of the road by the Maryland and N. York Iron and Coal Company.

In November, 1847, the railroad of the Maryland and New York Iron and Coal Company was sold, under a decree of the High Court of Chancery of Maryland, and purchased by John M. Forbes of the City of Boston, and by him was conveyed by deed to the Mount Savage Iron Company who now hold it.

On the 8th of October, 1850, the Maryland Mining Company claiming the right so to do under its charter, held a condemnation on a part of the same land which had previously been condemned by the Maryland New York Iron and Coal Company, for the purpose of constructing a railroad parallel to the existing railroad, and so close that the ends of the cross-ties of the two roads would have been in contact. The jury of condemnation giving a verdict of nominal damages to the Mount Savage Iron Company.

This condemnation, under the charter, to be available it was necessary it should be confirmed in the County Court.

To its confirmation, objections were filed by the Mount Savage Iron Company. The chief objection, and that mainly relied upon was, that the land which was now sought to be condemned by the Maryland Mining Company, had been previously condemned by the Maryland and New York Iron and Coal Company, and was now held by the Mt. Savage Iron Company, and that the same land could not be a second time condemned. That although the charter of the Maryland Mining Company was the elder, yet that that company having stood by and not remonstrated or objected when the original condemnation was made and the road constructed, had waived its priority of choice to a route for the site of its road which it could not be allowed to reassume or assert to the detriment of the prior location and construction of the road then existing. The grounds taken by the Maryland Mining Company to sustain its condemnation appear in the opinion of the court.

The opinion of the court, delivered by Chief Justice Martin, was to the following effect:

The counsel for the Maryland Mining Company seek to sustain the condemnation in the case, and to procure the judgment of the court confirming that condemnation upon two grounds. First, that the condemnation made upon the 16th of January, 1844, embracing as it did an extent of ground averaging ninety feet in width, through the Narrows, took in more land than was wanted or was necessary to construct the railroad required. Secondly, that its charter being older than that of the Maryland and New York Iron and Coal Company, it had a priority of choice in the location of its road, of which it cannot be deprived.

The charter of the Maryland and New York Iron and Coal Company, as also all other charters of the kind in the State of Maryland, provides that when a condemnation is regularly made by a jury, that the same shall be confirmed at the next County Court, unless cause to the contrary is shown.—The original condemnation of the 16th of January, 1844, was returned to the court at its April term 1844 for confirmation, and no objections having been filed, it was duly confirmed by the court. By this act of confirmation, the condemnation became judgment of the court. Until that confirmation took place objections could have been filed by any one interested, but after confirmation the question of title was settled forever. It then became a

judgment of this court which it would not have the power even if it had the disposition, now to revoke or set aside. The matter has passed into judgment. The objection, therefore, that too much land was embraced in the original condemnation now comes too late. The remaining point to be considered then is, whether the fact that the Maryland and New York Iron and Coal Company was made and the road constructed under that condemnation without any remonstrance or objection on the part of the Maryland Mining Company, and with a knowledge on its part that such condemnation had taken place, and that the road was being constructed thereunder, and after having itself used the road for several years and paid tolls for the same is sufficient to preclude the company from now asserting its right of prior choice of route in conflict with the location made by the Maryland and New York Iron and Coal Company.

There can be no doubt that such acquiescence, on the part of the Maryland Mining Company, precludes it from asserting the right claimed. It would be inequitable to permit that company after thus acquiescing in the construction of the road, and after standing by and seeing another company expend vast sums of money, in grading the bed of the road, and laying down the track, now to set up any priority of choice in the location of a road, which it might have had under its charter. It may be said to bear an analogy to a common case put in the books—that if A stands by and sees B building a house, upon A's land, under the supposition that it belongs to him, and fails to give B notice of his claim or right to the land upon which the building is being erected, he is therefore stopped from asserting his title to the same.

But, fortunately, the court is not, in a question of so much interest, without authority to sustain the principle announced. The Court of Appeals of our own State, in the celebrated case of the Chesapeake and Ohio Canal Company vs. the Baltimore and Ohio railroad company have, in the very able opinion of the late Chief Justice of this court, most clearly and distinctly announced the legal principle now decided by this court. On page 151 of the opinion in 4 Gill & Johnson, the Court of Appeals say:—"And if after being formed it (the Chesapeake and Ohio Canal Company) had lain by and suffered the railroad to be made without interposing any claim to the route on which the road was constructed, such acquiescence would have amounted to a waiver of its rights, which it would not afterwards be permitted to resume to the destruction of the road."

The counsel for the Maryland Mining Company have in argument contended that notwithstanding the prior condemnation of the land by the Maryland and New York Iron and Coal Company, yet that the same land is subject to be condemned a second time and is not exempt from the present condemnation, because of the prior condemnation. To sustain this principle the case of the Bellona Co. has been read from 3 Bland's Reports. In that case the Bellona Co. was authorised by its charter to purchase and hold lands for the purpose of making erections and improvements for the manufacture of gun powder. The Baltimore and Susquehanna railroad company condemned a route for their railroad through its lands, which were held by purchase. The Bellona Company contended that as it was authorised by its charter to purchase and hold lands, to take any part of them, by condemnation, for the use of a railroad, would be in violation of its chartered rights. The case cited

decided that the lands of the company, though held under its charter, were still liable, like the lands of a private citizen, to the exercise of the right of eminent domain by condemnation. But that case is widely different from the one now under consideration. In the case of the Bellona Company the land sought to be condemned was held, by purchase, in the usual way. There had been no previous exercise of the right of eminent domain as there has been in the present case. The sovereign power of eminent domain has been previously exercised over the very land upon which the Maryland Mining Company seeks again to exercise it. This cannot be done. The power once used has been exhausted upon the subject.

The theory upon which private property can be condemned at all, is that it is for the public use.—The right of eminent domain can only be exercised for the public use.

This power, however, the State may exercise herself, or she may delegate it to corporations or to individuals who can then exercise it as the agents of the State. When the State delegates this power to a corporation, and it is exercised by the corporation, the property upon which it is exercised is then dedicated, in the eye of the law, to the public use.

There is another view of the question. The State in granting to a corporation the power to exercise the right of eminent domain by condemnation, for the purpose of constructing a railroad, enters into a contract with that corporation, the effect of which is that the State, in consideration that the corporation will expend its money in the construction of a certain railroad, and which the State considers would be a public benefit, grants to that corporation the power to exercise the right of eminent domain by condemnation, and to receive tolls, &c., for the road. This contract between the State and the corporation, the State itself cannot touch or violate. The contract is protected by that clause of the Constitution of the United States prohibiting the States from passing laws violating the obligations of a contract.

Report of the Postmaster General.

The number of mail routes within the United States, at the close of the fiscal year ending on the 30th of June last, was 5,590; the aggregate length of such routes was 178,672 miles; and the number of contractors employed thereon, 4,760.

The annual transportation of the mails on these routes was 46,541,423 miles, at an annual cost of \$2,724,426, making the average cost about 5 cents and 84 mills per mile.

The increase in the number of inland mail routes during the year was 649; the increase in the length of mail routes was 10,969 miles, and the annual transportation of the year exceeded that of the previous year by 3,997,354 miles, at an increased cost of \$343,440.

The mail service in California and Oregon has not been embraced in the foregoing statements.

There were, on the 30th of June last, five foreign mail routes, of the aggregate length of 15,079 miles, and the annual price of the transportation thereon, payable by this department, was \$264,506; being an increase of \$8,814 on the cost of the preceding year.

There should be added to the cost of transportation, as above stated, the expense of mail messengers and local and route agents, (which expense is chargeable to the transportation fund,) and which for the last fiscal year amounted to \$107,042; being an increase of \$45,529 on the expenses of the mail messengers, and local and route agents, for the preceding year.

The increase of our mail service for the last fiscal year, over the year preceding, was about 9 4-10 per cent and the increase in the total cost was about 12 7-10 per cent.

The number of Postmasters appointed during the year ending June 30 1850, was 6,518. Of that number, 2,600 were appointed to fill vacancies occasioned by resignations; 233 to fill vacancies occasioned by the decease of the previous incumbents; 262 on a change of the sites of the offices for which they were appointed; 1,444 on the removal of their predecessors; and 1,979 were appointed on the establishment of new offices.

The whole number of Post Offices in the United States at the end of that year, was 18,417. There were 1,979 Post Offices established, and 309 discontinued during the year.

The gross revenue of the department for the year ending June 30, 1850, was \$5,552,971 48, derived from the following sources:

From letter postage, including foreign postage, and stamps sold.....	\$4,575,663 86
From newspaper and pamphlet postage.....	919,485 94
From miscellaneous items.....	3,086 66
From receipts on account of dead letters.....	1,748 40
	\$5,499,984 86
From the appropriation made by the 12th sec. of the act of 3d March, for the franked matter of the department....	20,000 00

From this sum should be deducted the amount received during the year for British postages, which are payable to that government, under the postal convention of December, 1845... 147,013 38

Leaving, for the gross revenue of the year.....\$5,552,971 48

The expenditures for the year were as follows:

For the transportation of the mails..	\$2,965,786 36
For ship, steamboat and way letters..	40,543 71
For compensation to postmasters....	1,549,376 19
For Wrapping paper.....	27,435 53
For advertising.....	72,633 50
For mail bags.....	31,160 82
For blanks.....	30,639 26
For mail depredations and special agents.....	29,725 49
For clerks for offices, (offices of postmasters).....	357,935 51
For miscellaneous items.....	107,716 76
dead letters.....	216 52
	\$5,212,953 43

Leaving as the excess of the gross revenue over the expenditures of the year, the sum of.....\$340,018 05

The undrawn appropriations for this department under the 12th section of the act of 1847, before referred to, amounted, on the 30th June last, (including the \$200,000 embraced in the revenues of the last year, and included in the foregoing balance), to.....\$665,555 55

The Auditor of the department estimates the balance to the credit of the revenue of the department on the day last mentioned, which will be ultimately found to be available, (and which does not include the \$665,555 55 above mentioned) at...\$649,165 31

Making an available balance, from all sources, of.....\$1,314,720 86
Out of which there is payable to the British Government for postages collected under the postal treaty during the fiscal year ending June 30, 1849, \$35,661 66.
And during the year ending June 30, 1850.....147,013 38 182,675 04

Leaving a net balance, (as estimated by the auditor) of.....\$1,132,045 83

The estimated income for the present year, including the sum of \$200,000 appropriated by the general government, is \$6,166,616 28, and the expenditures at \$6,019,809 09.

The Postmaster General recommends that the rate of letter postage be reduced to three cents on all pre-paid letters, and to five cents on all unpaid, that an uniform postage of one cent be imposed upon all newspapers, that pamphlets weighing two ounces pay two cents postage, and an additional cent on each additional ounce.

Statistics of Population by the Last Census.

RHODE ISLAND.

1850. 1840.
R. Island, complete..144,489 105,722 Inc 38,767

SOUTH CAROLINA.

S. Carolina, complete.639,099 555,232 Inc 83,867

The free population of South Carolina is 280,385; slaves 358,714. In 1840, there were 257,117 freemen and 298,115 slaves, showing an increase for the last 10 years, in the free population of 23,265, and in the slave population of 60,599.

ARKANSAS—Complete.

Counties.	Slaves.	Total pop.
Arkansas.....	1,586	3,259
Ashley.....	724	2,157
Carroll.....	197	4,280
Bradley.....	1,358	3,603
Benton.....	230	3,516
Chicot.....	4,183	5,365
Clark.....	976	4,139
Conway.....	204	3,484
Crawford.....	900	7,640
Crittenden.....	683	2,637
Dallas.....	2,443	6,724
Desha.....	1,164	2,875
Drew.....	749	3,024
Franklin.....	491	3,571
Fulton.....	49	1,696
Greene.....	44	2,592
Hempstead.....	2,338	7,260
Hot Spring.....	247	2,919
Independence.....	643	6,618
Izard.....	198	2,965
Jackson.....	520	3,306
Jefferson.....	2,559	5,651
Johnson.....	706	5,153
Lafayette.....	3,113	4,837
Lawrence.....	353	4,172
Madison.....	146	4,339
Marion.....	104	2,009
Mississippi.....	835	2,276
Monroe.....	380	2,190
Montgomery.....	56	1,700
Newton.....	40	1,632
Ouachita.....	3,255	9,294
Perry.....	91	921
Phillips.....	2,298	6,144
Pike.....	79	1,692
Poinsett.....	900	2,155
Polk.....	73	1,138
Pope.....	407	4,052
Prairie.....	265	1,964
Pulaski.....	668	4,627
Randolph.....	237	3,221
Saline.....	513	3,564
Scott.....	118	2,914
Searcy.....	93	2,053
Sevier.....	1,285	3,756
St. Francis.....	703	4,279
Union.....	5,191	12,203
Van Buren.....	71	2,063
Washington.....	1,090	9,567
White.....	283	2,484
Yell.....	243	2,716
Total.....	45,242	198,796

The white population of the State numbers 153,918, of whom 82,217 are males, and 70,701 females. Of the males, 29,612 are under 10 years of age; 15,413 are over 10 and under 18; 4,743 are over 18 and under 21; 25,628 are over 21 and under 45, and 6,821 are over 45 years of age. Of the females, 38,201 are under 16, and 32,500 are over 16 years of age. There are 45,242 slaves in the State, of whom 13,887 are under 8 years of age; 30,479 are over 8 and under 60, and 876 are over 60. There

are also 636 free persons of color in the State, of whom 333 are males and 303 females.

Report of the Secretary of War.

The following is an abstract of the estimates for the current fiscal year; transmitted to the two Houses of Congress, with the Annual Report of the Secretary of the Treasury, for the War Department:

Pay Department.

For pay, subsistence, &c., for the army.....\$2,807,127
For pay, subsistence, &c., for Military Academy, West Point.....90,593
For expenses of the office....10,900
\$2,908,620

Ordnance Bureau.

Amount of estimates.....989,815
For expenses of the office....9,500
999,315

Third Auditor.

Arrearages prior to July 1, 1815.....2,500

Commissary General of Subsistence.

For subsistence in kind.....1,076,015
For office expenses.....9,450
1,085,465

Surgeon General.

For medical supplies for the army.....67,395
For office expenses.....3,925
71,320

Topographical Bureau.

For surveys.....120,000
For rivers and harbors.....1,052,676
For roads.....70,000
For light-houses.....33,102
For office expenses.....6,650
1,282,428

Commanding General.

For office expenses.....1,800

Adjutant General.

For three months' extra pay. 10,000
For expenses of recruiting... 54,048
For office expenses.....11,950
75,998

Quartermaster General.

For regular supplies.....1,260,000
For incidental expenses.....450,000
For barracks, quarters, &c.... 800,000
For purchase of horses.....120,000
For transporting officers' baggage.....120,000
For transporting troops.....2,000,000
For clothing of the army, &c. 242,538
For office expenses.....13,290
For extra clerks.....5,000
5,000,828

Engineer Bureau.

For fortifications, &c.....739,300
For Military Academy, West Point.....51,935
For office expenses.....6,900
798,135

War Department Proper.

For salaries, &c.....17,850
For contingent expenses.....4,500
For W. W. Executive buildings, contingencies, &c.... 6,250
For rented buildings, rent &c. 25,525
54,125

Third Auditor.

For preventing and suppressing Indian hostilities.....75,000

Aggregate estimate for 1852.....\$12,290,535
Aggregates, amounting in the aggregate.....1,369,357

Total amount of estimates asked for.....\$13,659,892

Internal Improvements of the State of New York.

A SKETCH OF THE RISE, PROGRESS, AND PRESENT CONDITION OF INTERNAL IMPROVEMENTS IN THE STATE OF NEW YORK.

Continued from page 763.

In his annual message, in 1826, Governor Clinton congratulates the Legislature on the completion of the water communications between the great western and northern lakes and the Atlantic Ocean; thus opening artificial communications to an extent of four hundred and twenty-eight miles, and affording an "inland navigation unparalleled in the experience of mankind." After alluding to the rapid increase of transportation on the Erie Canal, the message says:—"All must admit that, within a short time, a double set of locks, and perhaps a canal on the north side of the Mohawk, from Utica eastward, will be required."

The canal commissioners, in their report of 1825, had suggested the probable necessity of a second canal from the east end of the long level near Utica, crossing to the north bank of the Mohawk, and continuing on that side of the river to Alexander's bridge, four miles below Schenectady, (where the upper aqueduct across the Mohawk was constructed,) there to cross the river, and to be continued on the south side to tide water.

The commissioners of the canal fund, in their report of 1826, stated the amount of tolls received on the Erie Canal in 1825, at \$492,664 23, and the Champlain Canal, at \$73,615 26. In giving a statement of the capital and revenue of the canal fund, they put down "the canals estimated at their cost, \$9,267,234 48." This included the sums expended for the Cayuga and Seneca, and Oswego Canals. In alluding to the acts of 1825, and the provisions for making loans for the new canals, the report says:—

"It is declared by the 5th section of the act authorising the construction of the Cayuga and Seneca Canal, that 'the moneys appropriated,' (that is, as we understand the expression, the debts contracted for making this canal,) 'shall form a part of the canal debt, and be repaid out of the canal fund.' As the Cayuga and Seneca Canal was not one of the communications between the great western and northern lakes and the Atlantic Ocean, to which the act of 1817, creating the canal fund, had reference, and as this fund was then, and now remains pledged to pay the debts contracted for opening those communications, it would be violation of the faith of the State, it would be an infraction of the Constitution, to charge upon this fund other debts that would take precedence as to the period of payment of those to which the first pledge was given. It was not, in the opinion of the commissioners of the canal fund, unconstitutional to charge the debt for making the Cayuga and Seneca Canal on the canal fund, but it would be an unconstitutional act to appropriate any part of this fund to pay the debt for making this canal, until the entire debts for making the Erie and Champlain Canals shall have been paid. This being our view of the nature of the pledge in relation to the debt that may be created for the Cayuga and Seneca Canal, we shall feel constrained to make the stock which may be issued for this purpose, reimbursable at a time beyond the latest period stipulated for the reimbursement of the stock for the Erie and Champlain Canals."

The same rule was applied to the Oswego Canal, and stock to the amount of \$571,304 was issued for these canals, payable on the 1st of July, 1846, the year after the last instalment of the Erie and Champlain Canal debt was payable. This is the identical stock which the commissioners of the canal fund redeemed and cancelled in July, 1846, out of the revenue of the Erie and Champlain Canal fund, after the original debt had been paid. And this is the money in regard to which it has been alleged that the new Constitution, although it was not ratified until many months after the transaction, intended should have been reserved for the fund set apart for the prosecution of unfinished public works.

The report of 1826 was written by Wm. L. Marcy, and signed by himself, Lieutenant Governor Tallmadge, A. C. Flagg, Simeon De Witt and A. Keyser.

The canal commissioners reported to the Assembly, in 1826, on the seventeen canal routes which

they were required to have surveyed. The estimates covered about 750 miles in extent, at an aggregate cost of \$5,100,000, averaging \$6,800 per mile. Seven years after this estimate was made, one of these canals, the Chenango, was constructed at an average cost of \$25,000 per mile. In the Senate, the report of the commissioners on the canal routes was referred to the canal committee, of which Mr. Wright was chairman, and on the 10th of April, he reported against constructing any of the canals surveyed, on account of the condition of the finances, all the cash resources of the state being, at that time, either pledged by the Constitution to the Erie and Champlain Canal fund, or required for the support of government.

The commissioners increased the toll on merchandise from two cents per gross ton per mile to three cents; while the average rates of the products of the country, coming to tide water, were fixed at a fraction less than one cent per ton. In defence of the policy of adding one-third to the rates of toll on merchandise, the commissioners stated, in their report, that in 1816, the Western Inland Lock Navigation Company, at Little Falls and the German Flats, charged at the rate of \$2 38 per ton, including toll on the boat, and at the rate of \$3 27 for passing from the Mohawk river through the canal at Rome into Wood Creek, "making the sum of \$5 75 per ton for passing on an artificial navigation of from 10 to 15 miles in its utmost extent."

The tonnage coming to tide water in 1825, is given at 185,405 tons; going from tide 33,669 tons—total, 219,074 tons. Ten years after, in 1835, there came to tide water, 753,191 tons, being an increase of 567,786 tons. In 1845, there came to tide water 1,206,963 tons, showing an increase in ten years of 451,752 tons, and in twenty years of more than a million tons. The products coming to tide water for the last four years average 1,533,000 tons for each year. The increase, comparing 1845 with 1849, is 375,000 tons.* The tonnage coming to tide water has usually been estimated to be five times as great as the quantity going from tide water. In 1847, the products coming to market were a fraction more than six times the quantity going from tide water.

In the Legislative session of 1825, an act was passed authorizing the Governor and Senate to appoint three commissioners, "to explore and survey the various routes for a good road from Lake Erie to the Hudson river." Governor Clinton nominated Jabez D. Hammond, Nathaniel Pitcher, and George Morell, who made their report to the Legislature of 1826. They estimated the cost of a road from Kingston to the town of Dunkirk, 362 miles, at \$750,000. Mr. Cruger, of Steuben, was chairman of the state road committee in the Assembly, and reported a bill for the commencement of the road, which, after a long and animated discussion, was finally postponed to a day beyond the session, by a vote of 50 to 48. General Root, who had been the uniform opponent of canals, was the ardent champion of the road, and Colonel Young, who was Speaker of the Assembly, opposed the bill with all his energy. The survey of the road cost the state \$22,625. Wm. Campbell, who was afterwards Surveyor General of the state, was the principal surveyor and engineer selected by the commissioners.

It was in the year 1826, that the first act for a railroad was passed by the Legislature of New York. This act incorporated Stephen Van Rensselaer and others, and gave them authority to construct a railroad from Albany to Schenectady. This road, only sixteen miles long, and one of the most important thoroughfares in the State, was not completed until several years after the charter was obtained.

As soon as portions of the Erie and Champlain Canals were navigable, it became necessary to prescribe regulations for the government of those who were engaged in the business of transportation as well as for the officers entrusted with the superintendence of the works and collection of tolls.—

* The Revised Statutes fixed the ton at twenty hundreds. This provision went into effect on the canals in 1830, and the reports, since that time, where a ton is spoken of, mean two thousand pounds.

The first act "for the maintenance and protection of the Erie and Champlain Canals, and works connected therewith," was passed April 13, 1820, and consisted of twenty-three sections. This act embodied the experience of the acting commissioners at that time, and most of its provisions are still in force.

In 1816, Mr. Stebbins, then a member of the Senate, and who was afterwards bank commissioner, reported a bill "relative to the canals," which became a law. This act provided for establishing a canal board, to consist of the canal commissioners and commissioners of the canal fund, and authorized this board, "to regulate the tolls to be collected on the canals, and to appoint the collectors of tolls," to designate the depositories for tolls, and fix the compensation for the services of collectors, and the amount of bonds to be given by them. The canal commissioners retained the power of appointing superintendents of repairs, and fixing their compensation. This act consists of thirty-eight sections, and its main provisions are still retained in the laws in relation to the canals.

The canal commissioners, as well as the commissioners of the canal fund, first separately, and afterwards jointly, as a canal board, were authorized to make rules and regulations on all subjects connected with the collection of the revenues, and the navigation of the canals. A course of legislation has been adopted, by making annually such amendments to the laws by the Legislature, and such alterations in the regulations by the canal board, as experience, from time to time, demonstrated to be necessary—until a code of laws and rules for the government of the public works has been established, possessing great efficiency in maintaining good order, protecting the canals from injury, and securing the revenues. The duties of those who navigate the canals, in regard to registering, clearing, and weighing their canal boats, in passing locks, in meeting other boats, and in selecting berths, and all matters which regard their obligations in respect to each other or to the state, are laid down with such plainness and precision, and enforced with such exactness and impartiality, as to command general approval, and ensure an uncommon degree of good order on these crowded channels of trade. Each boat is furnished with a copy of the laws and regulations, and a brief summary of the duties and liabilities of boatmen is printed on the back of each clearance, of which more than eighty thousand are annually issued on all the state canals, and without one of which no boat or float can pass a lock on the canal. No master of a canal boat can, therefore, plead ignorance of the laws.

The canal board consists of the canal commissioners and the commissioners of the canal fund. At the first organization of the board in 1826, it was composed of the following persons: James Tallmadge, Lieutenant Governor; Stephen Van Rensselaer, Samuel Young, Henry Seymour, and W. C. Bouck, canal commissioners; Wm. L. Marcy, A. C. Flagg, Simeon De Witt, Samuel A. Tolcott, and A. Keyser, commissioners of the canal fund,—*Merchants' Magazine*.

To be continued.

Extracts from London Correspondence of Nat. Int. POPULATION, AND STANDING ARMIES OF EUROPEAN NATIONS.—COST OF GOVERNMENTS.

France has a larger population than Great Britain, but scarcely any colonies except Algeria. In 1843 her civil administration employed 597,720 persons, at a cost of £12,000,000. France has as numerous and expensive a navy as England, though with her few colonies and little commerce it is difficult to see the necessity for it. Her standing army consists of 450,000 men. The actual expenditure per head in France, for purposes of government, is 31 shillings.

Austria and Prussia exceed us in point of home territory, but they have no colonies, and comparatively little commerce. In Austria the number of public employees is 120,000. The army of Austria is 400,000; that of Prussia 120,000, besides the landwehr, or militia.

Holland has rich colonies and a prosperous and extensive commerce; but her population is below 3,500,000, and her colonies are very little expense to her. Her army consists of 100,000 men, and the

expenses of her government average 18 shillings 4 pence per head.

Belgium, with a population below 4,500,000, on an area of 12,600 square miles, without any colonies, or foreign commerce of any extent, has an army of 90,000 men.

Spain has a population of 12,500,000, and a surface of 180,000 square miles. Her colonial possessions, so far from being a tax upon her, are the main source of her wealth. Her inhabitants pay 18s. 3d. each, annually in support of the government.

Russia has a population of 65,000,000, and an army of 670,000. She has no colonies which cost her anything, and her commerce is unimportant.

IMPROVEMENTS IN THE MANUFACTURE OF STEEL. Patented by Josiah Marshall Heath, of Hanwell, Middlesex County, England, Sept. 6, 1849.

My invention consists in the application of iron, produced from iron ores without being brought to the state of pig or cast iron, to the manufacture of steel, the iron so produced being manufactured by a peculiar process discovered by me, which renders it more suitable for conversion into steel, than any iron hitherto made by the processes actually in use.

I have found that the excellence of steel depends upon the comparative purity or freedom from mixture with extraneous substances of the iron from which it is made.

All iron made by smelting the ores of that metal in a blast furnace contains impurities, in consequence of the alloys formed between the fluid metal and the earthy alkaline or other extraneous substances contained in the ores, the fuel, and the matters used to flux the ores.

These impurities can never be completely removed from the metal by the operations in use for converting the pig into malleable iron.

All the iron used for conversion into steel in this country is made from pig iron, and, consequently, contains more or less impurity. The nearest approach that can be made to the production of absolutely pure iron, is by deoxidizing pure iron ores by the well known process of cementation with carbon: I have found, however, that the metallic product so obtained upon a manufacturing scale, is totally unfit for the production of good steel, without further preparation; but that when subjected to the treatment hereinafter described, the result is an iron fit for making steel of finer quality than that now made from the best foreign iron. Any pure ore or oxide of iron from which the earthy or other extraneous matters can be easily separated by the mechanical operations of crushing, winnowing, washing, or magnetic attraction, may be treated in the manner I propose, but I prefer the magnetic ore of iron to all others. The ore is to be reduced to the state of grains, or even of fine powder, in order to facilitate the separation from it of the earthy or other extraneous substances, the pure ore is then to be reduced to the metallic state by any of the well known processes for depriving the metal of oxygen by acting upon it with carbon or any other reducing agent at a heat below that required to bring the metal to the fluid state. The metallic product obtained in this way, when operating upon a manufacturing scale, can never be obtained absolutely free from the last portions of earthy or other impurity, and always contains some portion of oxide of iron, which renders it quite unfit for conversion into steel of good quality, as it comes from the process of deoxidation without further treatment.

To make a perfect steel iron, I take the metallic product as it comes from the process of cementation or deoxidation, and mix it with a small portion of oxide or chloride of manganese, and a certain portion of coal or fir tar, or any cheap hydrocarbon or carbonaceous matter. I do not confine my invention to the use of any fixed proportions of these substances, for the proportions to be employed in each case will vary with the varying conditions of the mass, as the more or less perfect of the oxide, and the quantity of resident carbon mixed with it, but I have obtained the best results from the mixture of from one to three pounds of oxide or chloride of manganese, and from one to two gallons of coal or other tar to each one hundred pounds of deoxidizing ore.

This mixture of granular iron, tar and mangan-

ese, resulting from this process, is heated in a suitable furnace, and when the iron is at a welding heat, it is removed from the furnace, and subjected to the action of some suitable instrument of compression, in order to be formed into a solid bloom by any of the usual processes now in use.

The bloom is then to be reheated and shingled, hammered or rolled into bars in the usual manner. The bar iron so produced is to be converted into steel by the well known processes now in use, and its quality will be found superior to that made from the best iron hitherto procurable.

I do not claim as my invention any process or apparatus for reducing iron ores to the metallic state by cementation or deoxidation.

But what I do claim as my invention is, The treatment of the metallic product obtained from iron ores by deoxidation in the manner above described, and the application of the iron so produced to the manufacture of steel by whatever means the conversion of the said iron into steel may be effected.—*London Repertory of Patent Inventions*, May, 1850.

POPULATION OF CINCINNATI.

The census of Cincinnati gives a population of 116,078, an increase of 67,696 in ten years. The relative accession made to Cincinnati since 1840 exceeds that of Louisville, St. Louis and New Orleans, and with the same relative increase for ten years more, Cincinnati will exceed New Orleans in population. The Atlas says "Cincinnati has grown chiefly, by the growth of her manufactures, but in future both commerce and manufactures will increase. The returns of the number and value of industrial products in this city, will furnish an instructive text to those who would study the sources of prosperity in cities, states and empires."

	1840.	1850.
First ward.....	8,869	6,902
Second ward.....	5,370	8,112
Third ward.....	7,325	8,395
Fourth ward.....	6,087	10,457
Fifth ward.....	9,341	5,283
Sixth ward.....	4,577	9,600
Seventh ward.....	4,813	9,200
Eighth ward.....	new	14,424
Ninth ward.....	new	10,705
Tenth ward.....	new	13,032
Eleventh and Twelfth wards.....	new	19,480

46,383 116,078

Fulton properly belongs to the city as much as either of the other wards. With that, the population is in round numbers 120,000.

FINANCES OF SOUTH CAROLINA.

We copy from the late Message of the Governor of that State the following statement of her public debt:

5 per cents issued for the capital of the Railroad bank.....	\$46,714 34
Randolph stock.....	1,250 00
Revolutionary debt, estimated at.....	72,810 60
6 per cents, 1839, due in 1850.....	3,726 84
6 per cents, 1839, due in 1852.....	175,436 55
5 per cents, 1839, Fire Loan, foreign debt, due in 1858.....	471,111 12
5 per cents, 1839, fire loan, foreign debt, due in 1868.....	482,232 21
5 per cents, 1839, fire loan, domestic debt, due in 1860.....	482,232 23
5 per cents, 1839, fire loan, domestic debt, due in 1870.....	325,808 92

\$2,061,292 81

It will be perceived that the only debt to be provided for at an early date, is the 6 per cents, amounting to \$175,426 55, and payable on the 1st of January, 1852.

Since your adjournment, \$173,437 30 of the domestic, and \$23,250 80 of the foreign debt has been cancelled by the bank, besides \$8,750 of the Randolph stock, paid by the treasury.

The income of the State for the fiscal year terminating on the 30th of September, was

From taxes.....	\$313,381 65
All other sources.....	286,911 22

\$600,292 87

The balance in the treasury on the 1st of October last, was.....\$69,428 45

The net profits of the bank for the past year, including \$95,000, as arrears derived from business of former years, were \$364,825 59. From this amount there has been transferred to the sinking fund \$243,158 91, and been paid \$73,453 11 for interest on the debt in Europe, and the balance that the bank was in advance for interest and expenses—also the interests on the 6 per cents (fire loan), amounting to \$48,179 99.

The aggregate funds of the bank on the 1st of October, were.....\$6,353,660 06

From this deduct bank liabilities, viz:	
Issues, including \$250,000 for bills lost.....	\$1,760,098 00
Due treasury.....	69,428 45
Due banks.....	268,691 62
Due depositors.....	672,716 79
	2,770,934 86

Leaving the sum of.....\$3,582,725 20 as the surplus of funds in bank.

Vermont.

Vermont Railroads.—The Passumpsic railroad has been extended to St. Johnsbury, and the passenger cars ran to that place for the first time on Tuesday. There was no formal opening of the road, but the arrival was greeted by the ringing of bells, the firing of cannon and the cheers of the people. The road is 61 miles in length, and the whole cost of construction and equipment is \$1,650,000, or a little over \$27,000 a mile. The extension—20½ miles from Wells River to St. Johnsbury—has been constructed from the proceeds of bonds negotiated at par; and the Caledonian states that during the progress of the construction of the road the whole distance, the company have at no time been forced to provide the means by a resort to the payment of extra interest.

The Vermont and Canada Railroad will be completed to Rouse's Point in a few days. Missisquoi Bay bridge, to which point the cars now run, is but about seven miles from Rouse's Point, and the iron is already laid over more than half the distance.

The Prosperity of New Orleans.

Bitter truths, like noxious medicines, however unpalatable to the sense, must, when necessity requires, be administered, and the rejection of the one or the other is often prejudicial to soul or body. It is the height of folly to withhold wholesome remedies from a patient, because they may seem distasteful; and it is a mistaken kindness to keep from a dying man the knowledge of his condition. The declension of the trade and commerce of New Orleans, which is now palpable to every one, has not flashed upon the public mind abruptly. It has been foreseen and predicted, and the true friends of the city have from time to time interposed their premonitions, and lifted up their warning voice. We claim for the city press the credit of having faithfully discharged its duty in this respect.—It has not with held the truth from fear, favor or affection, but has boldly, in the face of day, proclaimed the humiliating fact, that New Orleans, was suffering in consequence of a want of public spirit in its resident population.—*N. O. Bulletin*.

Georgia.

Wilkes Railroad.—The Washington, [Ga.] Gazette says:—"We are gratified to be able to announce to our readers that this work has actually commenced, and that, after many years of hard struggle, we at last have the assurance that the object so industriously sought is destined to be ac-

complished. The engineering corps, under the direction of B. C. Morse, arrived at Double Wells on Monday night last, and on the following day commenced the location of the road. We learn by a letter received by the president of the company, from the chief engineer, that the entire line will be located by the 25th December, and that the company to whom the contract for grading, etc., has been let, will commence the work early in January.—Such arrangements having been completed, we begin to see more clearly our way out of the woods."

Population of Massachusetts.

The population of this State by the late census is 994,665, against 737,700 in 1840. The following are the details by counties:

	1850.	1840.
Suffolk.....	144,520	95,773
Essex.....	131,307	94,987
Middlesex.....	161,385	106,611
Worcester.....	130,817	95,313
Hampshire.....	35,714	30,897
Hampden.....	51,285	37,386
Franklin.....	30,869	28,812
Berkshire.....	49,596	41,745
Norfolk.....	79,000	53,140
Plymouth.....	55,699	47,373
Bristol.....	76,202	60,165
Barnstable.....	35,279	32,548
Nantucket.....	8,452	9,012
Dukes.....	4,540	3,958

Total.....994,665 737,700

POPULATION AT VARIOUS PERIODS.

Date.	Pop.		Per cent.	Yrs.
1701....	70,000			
1742....	164,000	Increase	134 2-7	41
1763....	241,025	"	47	21
1765....	227,926	Decrease	5 7-10	2
1776....	348,004	Increase	52 6-10	11
1784....	357,510	"	2 4-10	8
1790....	378,787	"	6 7-10	6
1800....	422,846	"	11 3-5	10
1810....	476,040	"	11 3-10	10
1820....	523,287	"	10 9-10	10
1830....	610,408	"	16 2-5	10
1840....	737,700	"	20 8-10	10
1850....	994,655	"	34 8-10	10

Safety of Railroad Travelling.

Dr. Lardner, in his work on railroads, gives a table, showing, from a very large induction of facts, that in every mile travelled, the loss of life has been only as 1 to 14,661,477—equal to going round the world nearly 600 times; and the reception of any injury whatever only as 1 to 7,320,738, or about 300 times round the world. From the chapter on the causes of accidents, it appears that of all accidents beyond control of passengers, 56 per cent arise from the collision of trains; 33 per cent from defects in wheels, axles, or rails; 5 per cent from switches; 3 per cent from obstructions on the road; 3 per cent from cattle on the line, and 1 per cent from the bursting of the engine boiler. Of accidents produced by imprudence of passengers, 28 per cent occur from improper place or posture; 24 per cent from leaving a train in motion; 16 per cent entering a train in motion; 13 per cent from jumping off; 12 per cent from crossing the track incautiously; 6 per cent from getting out on the wrong side, and 1 per cent from handing articles into a train in motion. Of these accidents, 67 per cent are fatal. It will be perceived that trains running out of the usual time are less safe than regular trains; and that a passenger's safety depends much upon his being always in his place and in due time.

Pennsylvania.

Hempfield Railroad.—A large meeting in favor of this project was recently held at Washington, Pennsylvania. It was addressed by Hon. R. M. T. McKennan, Hon. John Ewing, and George V. Lawrence, Esq., of Pennsylvania, and by Messrs. Paull, of Wheeling, and Langfit, of Wellsburg, Va. Mr. Henderson, the Treasurer, stated that

1228 shares had been taken—228 more than was necessary to secure the charter. Among others, the following resolution was passed:

Resolved, That this meeting ask the Legislature, at its next session, to pass an act granting the privilege to the voters of Washington county to decide by ballot, at the next spring or fall election, on authorising our county commissioners to make such appropriation out of the treasury as may hereafter be deemed expedient, for the prosecution of the Hempfield railroad.

Iron Works Stopped.

The Allentown Works, in Lehigh county, Pennsylvania, were closed on the 5th of November, and all the workmen discharged. These furnaces have made as much as ten thousand tons of iron in one year; and in that time consumed 20,000 tons of anthracite coal, 25,000 tons of iron ore, and 12,000 tons of limestone. They were constructed with all the new improvements, and were very advantageously situated on the Lehigh river. The quality of the iron was so decidedly superior, that it always obtained the highest prices.

The Miners' Journal says, "thus, one by one, our manufactories are closed. The above exhibits at a glance the condition of the iron trade in Pennsylvania. It needs no comment. It shows at once the immediate necessity of better protection in this department of our business interests."

New York.

Albany and Buffalo Railroads.—Fare Reduced.—

We understand that it is the intention of the several railroad companies, between Albany and Buffalo to run three daily passenger trains on their roads during the present winter. Two of these will be express trains—one a day, and the other a night express—making about the same speed the express trains now make. The fare on these trains will be \$9 50 from Albany to Buffalo, which is a reduction from the present rates of more than half a cent per mile.

The third will be a distributing mail and accommodation train, carrying passengers at a low rate of fare, probably about \$7 50. This discrimination in fare between the fast and slow trains, is just, and will we think be generally approved by the travelling public.

The new arrangements will probably go into effect about the 23d inst.

Rochester and Buffalo Railroad.—The consolidation of the railroads, between Rochester and Buffalo, went into effect on Tuesday.

We find in the Buffalo Courier the list of officers, which is as follows:

Directors.—Dean Richmond, Henry Martin, Francis H. Tows, Gaius B. Rich, D. W. Tomlinson, Joseph Field, Frederick Whittlesey, Asa Sprague, Geo. H. Mumford, Heman J. Redfield, James Brisbane, Samuel Dana and Wm. F. Weld.

The directors elected the following officers:

Joseph Field, President; Dean Richmond, Vice President; Henry Martin, Superintendent; F. Whittlesey, Secretary; J. O. Putnam, Treasurer.

Testimonial for Railway Services.

The citizens of Montreal have presented to John Young, Esq., a well known and eminent merchant of that city, as a token of respect and gratitude for the eminent services rendered by him in promoting the construction of the St. Lawrence and Atlantic railway, a superb silver Epergne.

To copy the description of the Montreal Herald, "the pillar, supporting the crystal dish, consists of a maple tree, on the upper branches of which it

rests, and around which stand three beautifully modelled and executed figures, in frosted silver—two navvies, one leaning on a shovel, the other on a pick axe, and an engineer with his theodolite in his hand. These figures are from six to seven inches in height. Below are three tablets, two of which bear engravings of railroad scenes, and the third an inscription stating the object of the testimonial."

Mr. Young has from the first been a steadfast friend of the above road, and but for his support, its final success would at least have been very problematical.

Ohio.

A correspondent of the Pittsburgh Gazette, writing from Marion, whose signature, "R," leads us to suppose him to be the person who enjoys the best means of knowing the condition of the Bellefontaine and Indiana road, gives us the following information relative to railroads in that quarter. He says:—"The completion of the Bellefontaine and Indiana railroad, which is now in process of construction, and which passes centrally in a south westerly direction through the whole county, and thence on to the Indiana State-line, will totally change the aspect of affairs in this region. In a few weeks, the Cleveland, Columbus and Cincinnati railroad will be completed to Galion, seventy-nine miles from Cleveland. This point is within twenty and a half miles of the Capital of our country, and it is expected that the grading and masonry on this distance of our railroad will be ready for the superstructure by the first of August next. We may hope, soon after, to have a continuous railroad connection with the lake at Cleveland; and, on the completion of the Ohio and Pennsylvania railroad to Alliance, and of the Cleveland and Pittsburgh railroad to the same point, (both of which works will no doubt be completed next year to the point mentioned,) we shall have a continuous railroad to Pittsburgh. But this route, although infinitely better than any present means of intercourse, is rather circuitous, and will not satisfy our citizens, except as a temporary expedient. We are looking forward to the direct connection, through Mansfield, Wooster, &c., and must have it. A vigorous effort on the part of the Ohio and Pennsylvania company, if properly backed by the citizens of the counties interested, must result successfully, and I am happy to find that it is to be made.

The year 1822 should not be allowed to pass without a direct railroad from Pittsburgh to Terre Haute. It can be done, and I trust it will be done."

New York.

The Erie railroad company have recently caused a survey to be made for the purpose of determining whether a practicable route existed, from the line of their road, by way of Jamestown to Erie, Penn. The survey shows that the summit is reached 18 miles from Erie, with a grade 40 feet to the mile. From this to the intersection of the New York and Erie railroad the route is entirely level. On the whole, it is one of the cheapest routes in the country, as already surveyed. Further examinations, however, are about to be made in order to ascertain if the summit cannot be reached with a less grade than 40 feet, as also to see if the steamers this side of that point cannot be crossed at a less elevation, and thus reduce the expense of construction. It is believed that this can be done.

Buffalo and Conkoccon Valley Railroad.—The Buffalo Advertiser states that at a recent meeting of the directors of this road, held at Lakeville, it

was agreed to adopt the middle, commonly called the Conesus route, and to give the people on that line ten days to obtain the amount of stock that would fall to them to raise—viz: \$310,000. The meeting then adjourned to meet again as soon as the president should be notified that the stock was obtained. On the 22d notice was dispatched that the whole amount required had been secured, and a meeting of the directors is soon to be called.—Upwards of \$900,000 of stock to the road have been subscribed along the line, and there appears to be a determination to push it through, and that speedily.

Wisconsin.

On the 20th ult. the citizens of Milwaukee made a pleasure excursion over the Milwaukee and Mississippi railroad, which was completed for about five miles. Among the incidents of the trip, was the presence of Solomon Juneau, the oldest, and at one time the only white settler in Milwaukee, and who 16 years since was the only white inhabitant of the place.

Pennsylvania.

Railroad from Erie to the Ohio State Line.—This link in the great Lake Shore chain, is now in progress of construction under an amended act of the Legislature of Pennsylvania, passed April 29, 1844, incorporating the Franklin Canal company, and vesting in said company "the Franklin division of the Pennsylvania canal, from the aqueduct over French creek, on the French creek feeder to the mouth of French creek, together with all the surplus water power of said canal, all toll houses, implements, and all the estate, real and personal, purchased and owned by the commonwealth, for the use of the said canal."

This act was amended by an additional act passed April 9, 1849, which provided, "that upon the said company's increasing the stock thereof to the amount of five hundred thousand dollars, it shall have the privilege of extending from the north end thereof to Lake Erie, and from the south end to Pittsburgh, by such route as the company shall deem most expedient and advantageous; the said railroad shall be constructed, subject to all the provisions and restrictions of an act regulating railroad companies, passed the nineteenth day of February, A. D. one thousand eight hundred and forty nine."

In pursuance of these acts of incorporation, a company has been organised, and a portion of the line from Erie to the State Line has been placed under contract, the whole to be completed simultaneously with other parts of the great Lake Shore line now in progress.

The length of line to be constructed by this company is 25½ miles. The estimated cost \$631,930 64, or \$24,781 59 per mile. The ruling grade is 18 feet to the mile, and the total amount of rise and fall is 228½ feet. The route is very favorable with the exception of the crossings of Walnut, Elk and Crooked creeks, which require long and expensive bridges.

The whole extent of the great northern line of railroads from New York to the Mississippi, is now in progress, and two years will witness its completion. With the exception of a portion of the Erie road, the whole line is remarkably adapted to railroad construction, possessing easy curves and grades, and will be constructed at very low cost.—Nature has marked out this as one of the great routes for a railroad traversing the country from east to west. It can never have a rival for its ap-

propriate business, except in a parallel and continuous line. Upon the great lakes are destined to grow up some of the largest towns in the United States; and but a few years will elapse before this line will traverse an almost continuous village from one extremity to the other. It is a route possessing great internal strength, and we are not surprised at the rapid progress it is making.

The officers of the road are:

John Galbraith, Wm. A. Galbraith, William S. Lane, of Erie, Pa.; Heman B. Ely, Frederick Harbach, of Cleveland, Ohio.

John Galbraith, President.

Wm. S. Lane, Secretary and Treasurer.

Frederick Harbach, Chief Engineer.

Ohio.

Ohio and Mississippi Railroad Company.—This company has just completed its organization by the choice of the following gentlemen as directors:

Directors in Ohio.

Jacob Burnet,	John Baker,
A. Taft,	J. S. G. Burt,
E. B. Reeder,	J. C. Hall,
C. W. West,	John Slevin,
G. W. Cochran,	D. Z. Suydam,
Henry Hanna.	

Directors in Indiana.

Wm. Burtch,	W. R. McCord,
A. T. Ellis,	S. Judah,
J. Dean,	G. W. Lane,
John Cobb,	E. Cornwell.

Director in Illinois

Joseph G. Bowman.

We learn that measures are to be taken for the immediate commencement of this great work, which the people of Cincinnati feel to be so important to the interests of that city. With the strong motives which exist for its construction, we look for a determined and vigorous effort to secure this end.

Maine.

Androscoggin Railroad.—The Main Farmer says that the grading of the Androscoggin railroad is going on as far up as Livermore; the greater portion of the stock has been taken up, principally on the line of the road, and there is now no reasonable doubt of its completion in due time. We also learn from the last number of the Farmington Chronicle that the directors have just completed a survey for extending this road to Farmington Village. The distance from the part under contract at Livermore Falls to the terminus in Farmington, is about 15 miles, and it is said to be of easy grade. The cost of grading is estimated at about \$75,000, and it is supposed that as much more would complete the road and put it in running order.

York and Cumberland Railroad.—We learn from the Portland Advertiser that it is the intention of the directors to open this road to Gorham early in December. We are informed that their engineer, A. P. Robinson, Esq., has made a draft of what may be called a locomotive car, viz: a light locomotive with a passenger car built on to the rear of the locomotive, so that both form but one car. This is to be run hourly to Gorham, and being lighter, does not wear out the road like a heavy locomotive. In England, this description of hourly cars has been found very profitable and useful, and we think the directors of this road have acted wisely in concluding to place one on their road.

An hourly steam omnibus to Stevens' Plains, Saccarappa and Gorham, will bring those several villages as near the city as the extreme parts of wards 7 and 1 now are for ordinary business purposes.

Arrangements have been made to begin on the other end of this road at Great Falls, and the cars from that end will probably reach Alfred next year.

Penobscot and Kennebec Railroad.—The following persons were elected directors of this company at a meeting of the stockholders held at Bangor on the 27th ult.

George W. Pickering, Bangor.
S. P. Strickland, "
M. L. Appleton, "
W. B. S. Moor, Oldtown,
John M. Wood, Portland.
John A. Poor, "
Francis O. J. Smith, Westbrook.

Illinois.

By the terms of the contract for building the Galena and Chicago railroad from Elgin to Belvidere, the first six miles of the road, west of Elgin, are to be in readiness for the superstructure by the 15th of May next; the next six miles by the 15th of the following July; and the whole, as far as Belvidere, by the 1st of September, 1851. The superstructure will be laid down, and the cars put upon the different sections as fast as the grading and bridging of each are completed. The directors expect to be in Belvidere with the cars, as early as the 25th of December, 1851. For this road there have been purchased 5,000 tons of T rail. One thousand tons have already been shipped, and the remaining four thousand tons are to be delivered on the seaboard in March and April next. The above iron will be sufficient to complete the whole of the second division from Elgin to Rockford.

Canada.

The people of Montreal are agitating the subject of building a railroad from that city to the town of Prescott, on the St. Lawrence river, opposite Ogdensburgh, with a view to its ultimate extension to the western end of Lake Ontario, there to connect with the road in progress to Detroit. A meeting was recently held in Montreal, composed of her most influential citizens, to take the necessary steps to secure a survey of the route, at which a very respectable sum was raised for this purpose.

The above project is the necessary complement of the St. Lawrence and Atlantic, and the Quebec and Richmond railroads. These will soon open to Montreal a route to the Atlantic and the Gulf of St. Lawrence. An imperative necessity is now felt for the extension of these lines westward, for the purpose of bringing to that city, and throwing upon these roads, the business of Canada West, as well as such as naturally falls upon the river St. Lawrence and the great lakes. All the great cities of the United States have for years been prosecuting with most untiring perseverance, works of immense magnitude and cost, for the purpose of drawing from its natural channel the business of that vast region which the St. Lawrence drains. They have so far succeeded in their efforts, as to seriously affect the trade of Montreal, and to render it at one time doubtful whether she was not actually declining, notwithstanding all her natural advantages, which but for such works would have constituted her the commercial centre of that great valley.

It was to counteract the influences so prejudicial to her interests, that the construction of the St. Lawrence and Atlantic railroad was commenced. It has been prosecuted under the conviction that it was the only work that could sustain that city, and restore to the St. Lawrence river a portion, at least, of the business which was once accustomed to pass over that route. The speedy construction of this

road is secured, and Montreal now naturally turns her attention to the continuation of a line of railroad westward, which, for the reasons we have stated, is imperatively demanded to carry out the idea which gave birth to the St. Lawrence and Atlantic railway.

To this road running west, the Toronto and Lake Huron railroad will prove an important auxiliary. This line will connect lakes Ontario and Huron, by a route not much exceeding 75 miles, thus cutting off the long circuit now made through Lake Erie. The Toronto and Lake Huron railroad company have at length procured sufficient means to place their road immediately under contract, which, we understand, is to be done very shortly. The other great line in the upper part of Canada West, from Hamilton to Detroit, is already under contract, with sufficient means for its completion.

The construction of the various lines above described, with the short line from the Ottawa to Prescott, will secure to Canada about all she will need as far as railroads are concerned. The great lines in these Provinces, with the exception of the St. Lawrence and Atlantic, the Toronto and Huron, and the road from Ottawa to Prescott, will run parallel with the river; the limited width of the good lands in this valley precluding the necessity of many lines running at right angles to the river.

When the above projected roads are secured, Montreal will be then able to test her capacity for maintaining herself as the commercial emporium of the valley of the St. Lawrence. If she cannot maintain her position with these aids, she may then at once surrender this point to some more favored rival, and cease to expend her means upon projects which can never give to her commercial greatness. But we fully believe when all her schemes are accomplished, her position will be as impregnable in commerce, as that of Quebec in war; and that she will become one of the most flourishing cities of North America.

Pacific Railway.

The Little Rock, (Ark.) Gazette notices the arrival there of Captain Joshua Barney's surveying party from St. Louis. Capt. Barney belongs to the U. S. Topographical Engineers, and he has been engaged for a year past, under the orders of government, in an experimental survey of a railway route from St. Louis, via Fulton, on Kidd river, to El Paso on the Rio Grande, and thence to the Pacific Ocean. The Gazette learns from conversations with Capt. Barney and one of his assistants, that the line marked by them deviates but little from a direct course.

"It passes near Greenville, Mo., thence about 15 miles east of Pocahontas, in Randolph county, Ark.; crosses White river at Jackson Port, Jackson county; Little Red river near Prospect Bluffs; and runs about three miles east of Senrey, White county; intersects the road from Little Rock to Memphis, at P. McCraw's, 13 miles east of this city; and strikes the Arkansas river about three or miles below this city.

For some 60 miles before striking the Arkansas, the line, we understand, is perfectly straight. At White river, a considerable deviation from a direct line is made, to avoid some abrupt hills that make in to the river; but, beyond that river, a perfectly straight line, for some 80 to 90 miles, can be obtained, without any obstacle to the construction of a railroad. The principal obstructions are found north of the N. Missouri line.

The party are now engaged, on the south side of the Arkansas, in exploring the Fouché bottoms and valley, to find a level route in the direction the road is to run, and, when we last heard from them, we understood the prospect was very flattering for finding a good level route, without much deviation from a direct line.

AMERICAN RAILROAD JOURNAL.

Saturday, December 7, 1850.

Kentucky

In no State in the Union is the subject of railroad construction receiving more attention than in Kentucky. From a feeling of almost entire apathy, a year or two since, these projects now engross almost the entire attention of her people.

The most important of these projects are:

1st. The Maysville and Lexington Railroad.—This road will be about 75 miles long. The route has been surveyed, but the construction has not yet been commenced—those engaged in it being now actively occupied in raising the necessary means for this purpose. The progress already made places the success of this work beyond a doubt.—Already \$300,000 have been subscribed in the county of Mason and in the city of Maysville. The city of Louisville has also voted \$200,000 to this road, and the city of Lexington is soon to vote upon a proposition to subscribe \$300,000 more to the stock of the company. There is but little doubt of her favorable action in this matter. Louisville is now alive to the importance of connecting herself with the great railroad lines of the country, and it is through this road, in connection with the Louisville and Lexington railroad, that she proposes to connect herself with the railroads in the east, the Baltimore and Ohio particularly, and with the Virginia Central, should that line be constructed.—The Maysville and Lexington railroad will soon be commenced, with sufficient means, we have no doubt, to secure its vigorous prosecution.

2d. The Lexington and Covington Railroad.—The length of this road will be about the same as the one just described. A portion of this line is already in progress. The city of Cincinnati has subscribed \$100,000 to this road, and the city of Lexington proposes to subscribe \$200,000. The county of Kenton has also subscribed very liberally. This road is particularly favored by the city of Cincinnati, not only for the purpose of opening to her the rich agricultural regions of Kentucky, but for the purpose of connecting herself with a proposed road from Lexington to Nashville, Tenn.; thus practically realising the well known project of the Charleston and Cincinnati railroad.

3d. The Louisville and Nashville railroad. To this work the city of Louisville has just appropriated \$500,000. The distance between these cities is not far from 180 miles. From Nashville it is well known that a railroad extending to the Georgia State railroad at Chattanooga, is far advanced in the process of construction. On the north of Louisville, the Jeffersonville railroad is to be pushed forward so as to connect with the great line now in progress through Ohio and Indiana, and place Louisville in the great line of travel between the north and the south. We look upon the sum voted by Louisville as virtually securing the construction of this road to Nashville, as the country on its line is amply able to furnish the additional sum required, and there is every appearance of a willingness to do so.

Another project which is receiving much attention in this State, is a railroad from Louisville to Columbus on the Mississippi river, a short distance below the mouth of the Ohio. The length of this road would be about 250 miles, and its estimated cost \$4,000,000. One great object of this road is to form a junction with the Mobile and Ohio railroad, and thus opening a direct route by railroad to Memphis. It is also very important for Louisville to have the means of a constant communication with the Mississippi, independent of the Ohio river, the navigation of which is much obstructed for a long time every year. Another reason for this road, is the fact that it opens the shortest route to the coal fields of that State, which is a matter of vast importance to Louisville, in her rivalry with Cincinnati, in furnishing her with the means of becoming a manufacturing town. The great coal basin of the lower Ohio commences about 70 miles below Louisville by the route of this road.

Another project which will receive encouragement from Cincinnati, and to which Lexington proposes to subscribe \$200,000 (making, with her other proposed subscriptions, the sum of \$600,000), is a road from that city to Danville. Cincinnati will encourage this road, as forming a part of the line necessary to connect herself with Nashville. It will be seen by reference to a map, that a road from Louisville to Nashville, and from Danville to Nashville, might occupy a common line for a greater part of the distance south of Danville; thus saving the necessity of two lines. Whether the cities of Louisville and Cincinnati can be made to unite upon a common project for their mutual benefit, may well be doubted. They would certainly find it for their interest to make common cause in this instance.

A project is also engaging the attention of the people of Louisville is that of a branch from the Louisville and Lexington railroad to Danville, for the purpose of connecting herself with the rich country of which that town is the centre. This has not received any organized action in its favor, but its accomplishment is very probable. A road is also projected from Maysville to the mouth of the Big Sandy river, for the purpose of ultimately connecting the Kentucky railroads with the line of railroads in progress from the east.

A railroad from the lower Ohio near Henderson to Nashville has been proposed; but there appears to be little prospect of immediate commencement of this line. Many other projects have received more or less attention, which have not yet come before the public in the shape of an organized movement, but which will soon assume that form.

Of the roads in Indiana, in which Kentucky, and particularly Louisville is interested, the Jeffersonville is looked upon as the most important. To this road Louisville has just voted \$300,000. This road forms a junction with the Madison and Indianapolis at Columbus, about 65 miles from Louisville.

The New Albany and Salem railroad is another important project for Louisville, as it will bring that city into connection with the southwestern portion of Indiana.

Kentucky has thus laid out a plenty of work for herself in her various lines of projected railroads, and she is soon to become one of the most deeply interested of any State in the Union in the prosecution of the works. But her people are now fully aroused to their importance, and bring to them their means unexhausted by any kindred enter-

prises, and we may expect that her progress will soon equal that of the most active and enterprising of the southern States.

Pennsylvania.

Reading Railroad.—The receipts of this road for November have come to hand, and are as annexed:

Coal, tolls and freights.....	\$334,261 78
Passengers.....	11,159 35
Freight or merchandise.....	17,705 49
Mail.....	783 33
Miscellaneous.....	486 87

Total.....\$364,396 92
Tonnage.....218,579 tons.

The business of the fiscal year ending 30th Nov. has produced the following results:

Coal tolls.....	\$2,071,731 18
Merchandise freight.....	125,831 85
Passengers.....	148,378 99
Mail, &c.....	12,854 16

Total.....\$2,360,786 18
Tonnage.....1,351,507 tons.

Mr. Neal, in his well known report to the stockholders in September, 1849, made an estimate of the business of the road, which resulted in a dividend to the old stockholders of 4½ p. cent. In that statement he estimated the gross earnings at \$1,913,000, and the tonnage at 1,150,000 tons. The actual result of the present year's business shows an excess over this estimate of \$447,000 of earnings, and 200,000 tons of tonnage. Mr. Neal's estimate left a net surplus of \$197,319 for a dividend on \$4,218,114 of stock, equal to 4½ p. cent. With increased receipts of \$447,000, deducting liberally for increased expenses, there is a margin left for a much larger dividend. The net earnings are reported to 10 per cent. Compared with the previous year the earnings are:

	1848-9.	1849-50.
Coal.....	\$1,648,900 46	\$2,071,731 18
Passengers.....	155,908 18	148,378 99
Merchandise freight..	106,346 86	125,831 85
Mail, &c.....	23,435 09	14,854 16

Total.....\$1,933,590 59 \$2,360,786 18
Excess in 1850.....427,195 59

The rapid rise of the Reading railroad stocks, based upon increased receipts, has exerted a very favorable influence upon stocks in other roads. A large portion of this stock is held abroad, and while it is creating for itself a good reputation, it is doing the same good service for other roads.

Indiana.

Lafayette and Indianapolis Railroad.—We learn from the Lafayette Journal that at the late October election of directors for this company, the following gentlemen were elected, viz:

Thomas T. Brainbridge, Cyrus Ball, Joseph S. Hanna, John Purdue, Wm. F. Reynolds and A. S. White, of Tippecanoe county; Samuel Cason, H. G. Hazelrigg, S. S. Strong, and Wm. Zion, of Boon county; Harvey Bates and James Blake, of Marion county, (in the place of H. L. Ellsworth, resigned, and J. E. Loveless who declined a re-election), and Nathan H. Stockwell of New York city.

The new board was organized by re-electing the old officers—A. S. White, President, and Cyrus Ball, Treasurer.

The grading of the second and last division—Lebanon to Indianapolis, 26 miles—has been put under contract; several sections are already in great part completed, and the whole will be finished by the 1st of July next.

It was resolved by the board at a meeting held on the 8th ult., immediately to advertise for the construction of the remaining bridges between La-

fayette and Lebanon and for the delivery of the ties and sills on that division—and similar contracts were ordered to be published by the President for the eastern division as soon as arrangements were made for the iron.

Railroad Law.

Our readers will find an interesting decision in our paper of this week, touching the respective rights of railroad companies in reference to right of way. Similar cases may often arise, particularly under general railroad laws, such as we find in this State, and it therefore becomes very important that the rights of privileges should be definitely settled by the judicial enactments.

To Contractors.

SCIOTO AND HOCKING VALLEY RAILROAD. Sealed Proposals will be received at the Railroad Office in Portsmouth, Ohio, until the first day of January, A. D. 1851, for the Grading, Masonry and Bridging of 25 miles of the above road—20 miles extending from Portsmouth to the 20th mile Post, two miles east of Bloomfield, Scioto county, and five miles extending from Jackson, Jackson county, southerly to station number 2046.

The character of the work is such as is usually found in the State, consisting of about 30 sections of Grading, varying from five to eighty thousand cubic yards.

Plans and specifications will be ready for examination after the 15th day of December next, and the line ready for inspection after about the 20th of December.

Contractors proposing for the Bridging may bid according to plans furnished by the Engineer, or according to plans furnished by themselves.

By order of the Board of directors.

J. V. ROBINSON, President.

J. W. WEBB, Chief Engineer.

Scioto and Hocking Valley R. R. Office,
Portsmouth, Nov. 19, 1850. }

Railroad Iron.

THE "Montour Iron Company" is prepared to execute orders for Rails of the usual patterns and weights, and of any required length not exceeding 30 feet per rail. Apply at the office of the Company, No. 74 South 3d st., Philadelphia,

Or to the Agents,

CHOUTEAU, MERLE & SANFORD,

NO. 51 New st., New York.

September, 1850.

New York.

Sackets Harbor and Saratoga Railroad.—We are convinced, upon further examination, that in our paper of the 23d ult. we did injustice to the above project, in the manner in which we spoke of it.—We wrote the article referred to hastily, from an impression we had as to the nature of the country traversed, without in fact inquiring into its accuracy.—It is stated by those who have the best means of knowing, that the route is a very favorable one, that the country through which the road is to run, has abundant resources for the support of a railroad, having a good soil covered with timber, and abounding in valuable minerals. We are happy to make the *amende honorable*, and shall do all in our power to promote this work.

American Railroad Iron.

It will be seen by an advertisement in our paper of to-day, that the Montour Iron Co., at Danville, Pa., are now preparing to furnish railroads with American rails. This company possesses every facility for cheap manufacture, and in default of what is believed to be a suitable protection to the iron interest by the present tariff, we hope that railroad companies will be induced to support works which are now attempting the manufacture of rails, for the purpose of encouraging a branch of industry so important to every interest in the country. But for the steady influx of gold, and the high price of cotton, we should already have been suffering from excess of importations, and the work

on many of our lines of railroads, which are now in full tide of success, with means obtained from the sale of their securities, would have been entirely abandoned. Let us keep our money in the country if possible, for so long as we can do this, we shall escape those commercial embarrassments which we have seen are sure to follow excessive importations.

American Railway Guide.

This is the best Guide Book for Travellers now in use. It is carefully revised and corrected monthly, and contains valuable tables giving information of Southern, Western and Eastern routes, not to be found in any other publication.

CURRAN DINSMORE, Publisher,
138 Fulton st., New York.

Sold on many of the principal Railroads in the United States, and at the Periodical Depots.

✎ The "American Railway Guide" * * will be found to contain just the information which every traveller needs with regard to the departure and arrival of trains.—[N. Y. Tribune.

✎ It would be difficult to devise or execute a more convenient or perfect work of its class. * * —[Hunt's Merchants' Magazine.

✎ This supplies information desirable for every business man who is obliged to travel, and he can carry the book conveniently in his pocket, for reference at all times.—[Philadelphia Ledger.

✎ The most complete and accurate guide ever published.—[Scientific American.

✎ It is the best and cheapest book of the kind ever issued.—[Sunday Dispatch.

The Erie Canal, Its Prospects for the Future.

A strong apprehension is now beginning to be felt in many quarters in relation to the future prospects of this great work, in the rivalry it is soon to encounter with railroads which have either just commenced operations, or which are now in progress, for the purpose of becoming the avenues of transportation between the great lake and tide water. Up to the present season it has been without a rival; the only work which could come in competition with it, the line of railroads from Albany to Buffalo, being prevented from carrying freight by the exaction of the canal tolls, in addition to the cost of transportation. The Erie is now making rapid strides towards its completion, and freed from this incumbrance, will certainly take a large amount of freight which now passes over the canal. On the north, the Ogdensburg has demonstrated that with the present rate of canal tolls, a very considerable amount of business will pass over that route; certainly a large part of the western produce designed for consumption in the New England States. The Rome and Watertown road would be a still more formidable rival, but for the tolls to which its freight would be subject on passing from Rome to Albany.

A new project has recently been brought forward still better qualified to compete for the business of the canal than either of the others named: we mean the Sackets Harbor and Saratoga railroad. The route of this road connects Lake Ontario with tide water, by the shortest possible line, which has at its lake terminus a good harbor. Its grades are said to be favorable, not exceeding 40 feet to the mile, with a comparative small amount of rise and fall.

The distance between Sackets Harbor and Albany by this route is stated to be about 160 miles.—From Sackets Harbor to Port Colburn, at the commencement of the Welland canal, the distance is about 200 miles, making the whole distance from Albany to Lake Erie 360 miles, a little less than the route by the Erie canal.

At the present time the average cost of carrying a barrel of flour from Buffalo to Albany by canal, is about 55 cents. This may be stated as the lowest average. From Lake Erie to Sackets Harbor, we presume that 10 cents would be about a fair price. From Sackets harbor to Albany, by the proposed road, 25 cents per barrel would be a liberal compensation, making the whole cost of 35 cents, per barrel against 55 by the canal. Another very strong argument in favor of the above route, would be the great saving over the canal in point of time, and the greater freedom from liability to accidents, which are so common on the canal. A merchant could load a steamer at Toledo, and proceed with her direct to Sackets Harbor, and then by railroad to Albany and New York, keeping in company with his freight; which fact alone would be a very important consideration in favor of this route.

Upon the completion of the above route the canal must reduce its tolls very materially, or it must lose a large part of its immense business. To such a reduction there are felt to be serious objections, which are thus stated in a recent article in the Albany Journal:

With the means which the present income of the canals afford, the enlargement cannot be completed before 1859 or 1860. Every one will concede that nothing should be done to extend this time. The question, therefore, is, can the tolls upon any of the leading articles be reduced without materially curtailing the canal revenue? This question, and not whether it is desirable to retain the trade heretofore enjoyed, must be answered in considering the policy of reduction.

There are doubtless a few articles, a reduction of the tolls upon which would result in an increase of revenue. But would the revenue be increased by reducing the tolls upon wheat, flour, oats, corn, rye, &c., &c.? These constitute the bulk of the down freight, and it is their diversion which is most apprehended, and which would most seriously affect the trade and revenue of the canals.

In deciding this question, it will be necessary to inquire, first, whether, *without* a reduction, any considerable portion of this trade would be diverted? If such diversion is clear, it will be necessary to ascertain, secondly, what reduction will be necessary to retain it, and, thirdly, whether to retain it (when to do so the tolls would have to be reduced upon the vast tonnage which is in no immediate danger of diversion), the State would lose or gain by the operation? Looking at the matter in the mere light of dollars and cents, it would be better to lose ten per cent of the whole trade of the canal than to retain it by reducing the tolls fifteen per cent.

But it will be urged that, by reducing the tolls, we will not only retain the trade we have, but greatly increase it. The reply to this will be that the present capacity of the canal would not permit any very considerable increase of business upon it. It is now, during the busiest seasons, filled to very nearly its utmost capacity. If the tolls upon the leading articles should be reduced 10 or 15 per cent., the increase of trade necessary to make up for this reduction, would choke up the canal.

It is therefore a moral impossibility to materially reduce the rates of toll without diminishing the revenue of the canals, and so curtailing the surplus applicable to the enlargement. There is but one way by which the reduction may be made without retarding that work; that is, by *borrowing money to supply the deficiency which would be caused by the reduction*. And this can only be done by a vote of the people. There are those who believe that it is the true policy of the State to do this; but it is not our present purpose to say any thing upon that point. Our only desire is to direct public attention to the general subject.

The well founded alarm felt by the canal interest, and the real danger which exists that a large portion of the canal trade may be diverted to other channels, only goes to demonstrate the folly which dictated the suspension of the public works in 1842. But for that law, the enlargement would have been.

completed ere this, and produce could be conveyed from the lakes to the Atlantic at rates which would defy competition.

It is, however, idle to recur to the past. It is with the present and the future we have to do; and we have no doubt that, whenever this question is presented either to the Canal Board or to the Legislature, such action will be taken as shall be deemed best calculated to protect and promote the interests of the State.

If what we have stated in reference to the capacity of the above named roads is correct, the canal must reduce its tolls not 25, but nearly 50 per cent, to retain its present business. If this reduction will not allow any surplus to accumulate, the work of enlargement must stop. Notwithstanding the present prosperity of the canal, we believe it never stood in such a critical position as at the present time. It has felt secure because the State protected it from all rivalry; that protection, by the opening of other routes, is soon to be withdrawn, and it must now enter the list, and must stand or fall upon its own merits. Can it compete with the Sackets Harbor route, when that shall be completed? Certainly that route is vastly superior till Sackets Harbor is reached, as every lake vessel may load direct for this port. From that port to Albany, a road at moderate cost would carry freight for an equal number of miles at very little above the cost by canal.

What shall be done in view of this prospect, is certainly worthy of grave consideration. The canal is the great interest of the State. At the present time it supports the State Government, in addition to providing amply for the enlargement of the canal and the extinction of the State debt. The policy that should be pursued should be adopted at once, before we find it too late to regain the ground we have lost.

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To Contractors.

SIXTEEN MILES of the Grading and a portion of the Masonry of the South Side Railroad, extending to a point opposite Farmville, will be let on the 17th of December next. The work is to be finished by the 1st of January, 1852.

Profiles, Plans and Specifications, will be ready for inspection at Petersburg by the 10th of December.

C. O. SANFORD,
Chief Engineer.

South Side Railroad Office,
20th December, 1850.

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Notice to Contractors.

ATLANTIC & ST. LAWRENCE RAILROAD. PROPOSALS will be received by the subscribers, at Leary Tavern, in the town of Gorham, New Hampshire, until the 30th of November, for the Grading and Masonry of that portion of the Atlantic and St. Lawrence Railroad extending from Peabody's River in said Gorham, to the Connecticut River, a distance of about 30 miles.

Plans and profiles will be in readiness for examination after the 20th inst., at the Engineer's office at Gorham, N. H.

This line embraces some heavy work, and Contractors of means and experience will find this notice worthy of their attention.

Spirituuous liquors will not be allowed on or about the work; nor will the propositions of Contractors be considered, who have heretofore failed to pay the laborers employed, on this, or any other public work.

Cash payments will be made monthly, reserving ten per cent. until the final completion of the contract.

WOOD, BLACK & CO.

Portland, Nov. 5, 1850.

NOTICE

For Proposals for Railroad Iron, for the Alabama and Tennessee River Railroad,

TO BE MANUFACTURED FROM ALABAMA ORE.

THE Alabama and Tennessee River Railroad Co. invite proposals, until the 1st of January, 1851, for Iron Rails, to be made of Alabama Iron, for the Northern Division and part of the Southern Division of their road, embracing a distance of about 105 miles. The rails are to be of the H pattern, in lengths of 18 feet, and weighing 63 lbs. per lineal yard. They are to be delivered on the Coosa river, at a landing to be hereafter designated, between Kimulgee ferry and Fort Williams, commencing their delivery on the 1st of November, 1851, and continuing it at the rate of from 80 to 100 tons per week, until the whole quantity required (10,500 tons) shall have been delivered. They are to be inspected by Lewis Troost, Chief Engineer.

It is proper to state to iron masters and capitalists at a distance, that the country traversed by the Northern and part of the Southern divisions of the road abounds in excellent iron ore and bituminous coal, and possesses every advantage for the successful manufacture of iron, health, cheap labor and provisions.

Further information may be obtained by addressing the President of the Company at Selma, Ala.

By order of the Board of Directors.

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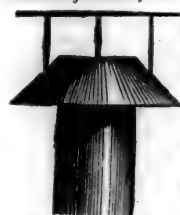
THE Patentee is now prepared to sell single or territorial rights to the use of the above named improvement. Recent experiments have demonstrated that this form of Boiler effects a saving of one-half the fuel required to run the best Cylinder Boiler with return flues, and about 40 per cent. of the amount used by Locomotive Boilers. The heat is so thoroughly applied to the water that the temperature in the chimney is reduced below 140 deg. The smoke and combustible gases are consumed within the furnace. The refuse gas instantly extinguishes flame or sparks, so that all danger from sparks is avoided. This Boiler is very compact in form, occupying less space than any other of like power.

References—Thomas H. Faron, Chief Engineer U. S. Mail Steamer Arctic, N.Y.; Messrs. Mott & Ayres, and Mr. D. F. Jaycox, Chelsea Iron Works, 26th street N.Y.; Messrs. Tugnot, Daily & Co., Franklin Forge, 1st avenue, N.Y.; Mr. John Mills, Machinist, 319 5th street, N.Y.; Mr. W. C. Smith, St. Albans, Vermont; and Messrs. Goulding, Green & Conroy, Keeseville, N.Y. Address, post paid,

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May 28, 1849.

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THIS valuable composition having been fully and extensively tested, is now offered to the public, as a sure remedy and preventive for incrustations in steam boilers of all descriptions. By its use, all scale is entirely removed from the boilers of Ocean and River Steamers, Locomotive and Stationary Engines, in from 3 to 20 running days, according to the size of the boiler and thickness of the scale. In New Boilers, all incrustation is prevented at a trifling expense.

The preservation of the boiler, great economy of fuel and labor, safety, and increased speed, are among the advantages to be derived from the use of this composition.

Orders should state the quality of water used, viz: "Salt," "Fresh," or "Brackish."

For sale, with directions for use, by

W. H. NEWMAN,
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TESTIMONIALS.

New York, August 17, 1850.

We have used Graham's Composition in the boilers of the Steamship Southerner, during several voyages between this place and Charleston. The boilers were old and very foul with scale, a very large quantity of which was removed by the use of the composition, and no new scale was formed.

From our own experience and observation in the use of the article, we are fully satisfied that it will effectually remove the incrustation made by sea water, and also that it will effectually prevent its formation.

We are also satisfied that the use of it will be attended with a great saving of fuel, and that it has no injurious effect upon iron.

DAVID N. MAXON, Engineer,
BERRY, Master,
Steamship Southerner.

Steamship Philadelphia, }
New York, August 27, 1850. }

I have used "Graham's Composition for Steam Boilers," in the boilers of Steamship Philadelphia, on the voyage to and from Chagres, and am entirely satisfied that it will remove, dissolve and prevent all scale or incrustation in salt water boilers.

For the preservation of the boiler and economy of fuel and labor, I hereby recommend the employment of this composition in the Boilers of Ocean Steamers

WM. HISBY,
Chief Engineer.

Novelty Iron Works, }
New York, July 5, 1850. }

We have examined the specimen of Graham's Composition for preventing incrustation of steam boilers, and we believe it may be used with perfect safety in reasonable quantities for the purpose intended, as there does not appear to be any agent in the composition calculated to injure the iron.

STILLMAN, ALLEN & CO.

Piermont, May 20, 1850.

I have used "Graham's Composition," and find it to produce the intended effect; and I hereby, without hesitation, recommend it for Stationary, Marine and Locomotive Engine Boilers.

JOHN BRANDT,
Superintendent Motive Power
New York & Erie R.R.

New York, July 25, 1850.

In answer to many inquiries as to the practical effect of "Graham's Composition," I will state that I have used it in the boiler of the Steamboat Sunwick, which had become considerably incrustated with hard scale from both salt and fresh water. We used 10 lbs. per day, for three days, without blowing off the water until the fifth day, when all was drawn off. To our astonishment, we found the whole interior of the boiler as clear of scale and smooth as when it came from the hands of the maker. The following week, we tried the same quantity in a small steam tow boat. The boiler had old scale of long accumulation and very thick. We ran the boat three days without blowing off, and on the fourth day washed out the boiler and found it, like the "Sunwick's," perfectly clean and smooth as when new. I am therefore enabled to state that the use of the composition in these two instances under my own immediate observation and direction, has been attended with complete success.

JAMES MORROW,
Engineer Astoria Ferry



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**Manufacture of Patent Wire
ROPE AND CABLES,**

For Inclined Planes, Suspension Bridges, Standing Rigger, Mines, Cranes, Derrick, Tilters, &c., by
JOHN A. ROEBLING, Civil Engineer,
TRENTON, N. J.

FORGING.**Ranstead, Dearborn & Co.,**MANUFACTURERS OF
LOCOMOTIVE CRANKS AND CAR AXLES,

ALSO

WROUGHT IRON SHAFTING,
And All Kinds of Hammered Shapes.
Office 25 Foster's Wharf, Boston.

Samuel D. Willmott,

MERCHANT, AND MANUFACTURER OF
CAST STEEL WARRANTED SAWS,
—AND FILES—

IMPORTER OF THE
GENUINE WICKESLY GRINDSTONES
NO. 8 LIBERTY STREET,
NEW YORK.

Railroad Instruments.

THEODOLITES, TRANSIT COMPASSES,
and Levels, with Fraunhoffer's Munich Glasses,
Surveyor's Compasses, Chains, Drawing Instruments,
Barometers, etc., all of the best quality and
workmanship, for sale at unusually low prices, by
E. & G. W. BLUNT,
No. 179 Water St., cor. Burling Slip.
New York, May 19, 1849.

IRON.**Iron.**

Pig Iron, Anthracite and Charcoal; Boiler and Flue
Iron, Spring and Blistered Steel, Nail Rods, Best Re-
fined Bar Iron, Railroad Iron, Car Axles, Nails, Stove
Castings, Cast Iron Pipes of all sizes, Railway Chairs
of approved patterns for sale by
COLEMAN, KELTON & CAMELL,
109 N. Water St., Philadelphia.

Stickney & Beatty,

DEALERS IN IRON AND IRON
MANUFACTURERS.

AGENTS for the Balt. City Rolling Mill, from
which establishment they are prepared to furnish
Ellicott's round, square, and flat bar iron, puddled
and charcoal boiler plates and billet iron—also agents for
the sale of the Laurel, Gunpowder and Locust Grove
(Balt.) forge pig irons, Locust Grove and Laurel Irons
for car wheels, Caledonian boiler blooms made from
cold blast iron, Old Colony and anti-Eatam nails, Wm.
Jessop & Son's steel, Coleman's blister steel and nail
rods, sheet, hoop, band, oval and common English
iron.

Nos. 18 and 20 South Charles st., Baltimore.

Car Wheel Iron.

100 Tons "Columbia" No. 2 Cold Blast Charcoal
Iron.

300 Tons "Salisbury" No. 1, do. do.
For sale by **CHARLES T. GILBERT,**
No. 80 Broad st.

New York, Sept. 21, 1850.

Railroad Spikes.

THE subscribers are prepared to make and execute
contracts for Railroad Spikes of a superior quality,
manufactured by the New Jersey Iron Company,
at Boonton. **DUDLEY B. FULLER & CO.,**
139 Greenwich st. corner of Cedar.

Railroad Iron.

1650 Tons, weighing about 61 lbs. per yard, 40
tons, weighing about 52 lbs. per yard, and
825 tons, weighing about 53½ lbs. per yard, of the latest
and most approved patterns of T rail, for sale by
BOORMAN, JOHNSTON & CO.,
119 Greenwich street.

New York, Aug. 26, 1850.

N.B.—B. J. & Co are also prepared to take con-
tracts for English rails, delivered in any of the Atlan-
tic ports of the United States.

Railroad Iron.

THE Undersigned, Agents for Manufacturers, are
prepared to contract to deliver Rails of superior
quality, and of any size or pattern, to any ports of dis-
charge in the United States.

COLLINS, VOSE & CO.,
74 South St.

New York, June 1, 1850.

Railroad Iron.

1,500 Tons weighing 53 lbs. per lineal yard.

500	"	"	57	"	"
500	"	"	56	"	"
500	"	"	60 & 61 lbs.	"	"

Also 2½x flat rails. All the above being of approv-
ed patterns. For sale by

DAVIS, BROOKS, & CO.,
63 Broad street.

N.B.—Rails imported on commission, or at a fixed
price.

**Railroad Spikes, Boiler Riv-
ets, etc.**

THE Subscribers, Agents for the sale of James S.
Spencer's, Jr., Railroad and Boat Spikes, Boiler
Rivets, and Wrought Iron Chairs for Railroads, made
at his Works near this city, will execute all orders
with promptness, despatch, and of the best quality.

ALSO IMPORTERS of English refined and Mer-
chant bar Iron; Extra refined Car and Locomotive
Axles (from 3½ to 6½ inches in diameter); B. O. Lo-
comotive Tire (welded by Baldwin). Also, supply
Boiler and Flue Iron cut to pattern or otherwise—
Spring, Shear, and Cast Steel, etc., etc., etc.

T. & E. GEORGE.

Philadelphia, November 14, 1850.

Railroad Iron.

THE UNDERSIGNED, HAVING made arrange-
ments abroad, are prepared to contract for the deli-
very of Foreign rails, of approved brands upon the
most favorable terms.

They will also make contracts for American rails,
made at their Trenton works, from Andover Iron, in
whole or in part, as may be agreed upon.

They are prepared to furnish Telegraph, Spring and
Market Wire; Braziers and Wire Rods; Rivets and
Merchant Bars to order, all made exclusively from An-
dover Iron. The attention of parties who require iron
of the very best quality for special purposes, is respect-
fully invited.

COOPER & HEWITT,
17 Burling Slip, New York.

February 15, 1850.

Railroad Iron.

THE Undersigned, Agents for Manufacturers, are
prepared to contract for the delivery of English,
Welsh and Scotch Rails, of any pattern and weight,
also for every description of English, Welsh, Scotch,
and Swedish Iron, Railway Chairs and Spikes, Riv-
ets, Bolts, Nuts, Washers, Chain Cables, Anchors,
Tin Plates, German Spelter, Iron Castings, and every
description of Machinery.

WILLIAM BIRD & CO.,
Iron and Tin Plate Merchants,
44 Wall st., New York.

And at 5 Martin's Lane, City, London,
and 140 Buchanan st., Glasgow.

July 27th, 1850.

Glendon Refined Iron.

Round Iron, Band Iron, Hoop Iron,
Square " Flat " Scroll "

Axles, Locomotive Tyres,
Manufactured at the Glendon Mills, East Boston, for
sale by **GEORGE GARDNER & CO.,**
5 Liberty Square, Boston, Mass.

Sept. 15, 1849.

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**PATENT HAMMERED RAILROAD, SHIP &
BOAT SPIKES.**—The Albany Iron Works
have always on hand, of their own manufacture, a
large assortment of Railroad, Ship and Boat Spikes
from 2 to 12 inches in length, and of any form of head.
From the excellence of the material always used in
their manufacture, and their very general use for rail-
roads and other purposes in this country, the manu-
facturers have no hesitation in warranting them fully
equal to the best spikes in market, both as to quality
and appearance. All orders addressed to the subscrib-
ers at the works will be promptly executed.

JOHN F. WINSLOW, Agent.

Albany Iron and Nail Works, Troy, N. Y.
The above Spikes may be had at fact: 17 prices, of
Erastus Corning & Co Albany; Meritt & Co., New
York; E. Pratt & Bro: & Co., Baltimore, Md.

**LAP—WELDED
WROUGHT IRON TUBES**

FOR

TUBULAR BOILERS,

FROM ONE AND A QUARTER TO SEVEN
INCHES IN DIAMETER.

THE ONLY Tubes of the same quality and man-
ufacture as those so extensively used in England,
Scotland, France and Germany, for Locomotive, Ma-
rine and other Steam Engine Boilers.

THOMAS PROSSER & SON, Patentees,
28 Platt street, New York.

Railroad Iron.

THE UNDERSIGNED ARE PREPARED TO
contract for the delivery of English Railroad Iron
of favorite brands, during the Spring. They also re-
ceive orders for the importation of Pig, Bar, Sheet, etc.
Iron.

THOMAS B. SANDS & CO.,
73 New street,
New York.

February 3, 1849.

Iron Store.

THE Subscribers, having the selling agency of the
following named Rolling Mills, viz: Norristown,
Rough and Ready, Kensington, Triadelphia, Potts-
grove and Thorndale, can supply Railroad Companies,
Merchants and others, at the wholesale mill prices for
bars of all sizes, sheets cut to order as large as 58 in.
diameter; Railroad Iron, domestic and foreign; Loco-
motive tire welded to given size; Chairs and Spikes;
Iron for shafting, locomotive and general machinery
purposes; Cast, Shear, Blister and Spring Steel; Boil-
er rivets; Copper; Pig iron, etc., etc.

MORRIS, JONES & CO.,
Iron Merchants,

Schuylkill 7th and Market Sts., Philadelphia.
August 16, 1849.

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Railroad Iron.

THE MOUNT SAVAGE IRON WORKS, AL-
legany county, Maryland, having recently pass-
ed into the hands of new proprietors, are now prepar-
ed, with increased facilities, to execute orders for any
of the various patterns of Railroad Iron. Communi-
cations addressed to either of the subscribers will have
prompt attention. **J. F. WINSLOW, President**

Troy, N. Y.
ERASTUS CORNING, Albany
WARREN DELANO, Jr., N. Y.
JOHN M. FORBES, Boston.
ENOCH PRATT, Baltimore, Md

November 6, 1848.

Railroad Iron.

THE SUBSCRIBERS ARE PREPARED TO
take orders for Railroad Iron to be made at their
Phoenix Iron Works, situated on the Schuylkill River,
near this city, and at their Safe Harbor Iron Works,
situated in Lancaster County, on the Susquehanna
river; which two establishments are now turning out
upwards of 1800 tons of finished rails per month.

Companies desirous of contracting will be promptly
supplied with rails of any required pattern, and of the
very best quality.

REEVES, BUCK & CO.
45 North Water St. Philadelphia;

March 15, 1849.

Tredegar Iron Works.

ROLLING MILL FOUNDRY AND MACHINE SHOPS. The undersigned continues to manufacture at his Works in this city (from best charcoal metal) Bar Iron of every description, embracing—Rounds and Squares, from $\frac{1}{4}$ to 5 inches diameter. Plates, from $\frac{1}{4}$ to 7 inches, all thicknesses. Bands and Scrolls, all sizes. Boiler plate and Plough Iron. Railroad and Locomotive Axles and Tires. Locomotive Frames, Spikes and Plates. Hoops, Ovals, Half Ovals, Half Rounds, Angle, T, L, and indeed every description of Iron usually manufactured, all of which he warrants to be equal to any made in this country. He also manufactures at his Foundry and Machine Shops all descriptions of Railroad Work, say, Locomotives, Railroad Wheels and Axles complete and ready for the road, Railroad Chairs, etc. Also, Marine and Stationary Engines all sizes, Sugar mills and Engines, Horse mills, and every kind of Machinery usually required for the operations of the country. He has paid particular attention to getting up machinery, etc., for Gold Mine operations, and those in want of such work might find it to their advantage to give him a call.

J. R. ANDERSON.
Richmond, Va., Sept. 10, 1850.

CUT NAILS OF BEST QUALITY, BAR IRON (including Flat Rails) manufactured and for sale by
FISHER, MORGAN & CO.,
75 N. Water St., Philadelphia.

Wheel, Forge and Foundry Iron.

LOCUST GROVE Wheel Iron of great strength and superior chilling property.
Balt. Charcoal Forge Iron, from Patuxent, Curtis Creek and Gunpowder furnaces.

Elkridge Foundry Iron, of superior strength and softness. Anthracite and Charcoal Iron from Pennsylvania and Virginia. Gas and Water Pipes, Lamp Posts from Elkridge furnace.

LEMMON & GLENN,
Sm9 62 Buchanan's Wharf, Baltimore.

S. S. Keyser & Co., IRON WAREHOUSE,

Corner of South and Pratt Streets,
BALTIMORE, MD.

Selling Agents for the Rough and Ready Bar Iron and Elk Boiler and Flue Iron Rolling Mills, Sarah and Taylor Furnaces, and Wrightsville Hollow Ware Foundry, and Dealers in Bar and Sheet Iron, and Cast, Sheer, German, Blister, Spring and Electroplated Steel, etc., etc.

Smith & Tyson,

GENERAL COMMISSION MERCHANTS,
No. 25 South Charles St., Baltimore, Md.

AGENTS for the Celebrated Columbia Pig Iron, suitable for Car Wheels and Chilled Rolls.

Columbia refined Charcoal Blooms; Refined Charcoal Juniata Billet Iron for Wire; Refined Iron for Bridging, of great strength; Cut Nails, Spikes, and Brads; Railroad Spikes and Wrought Chairs. 22tf

Railroad Iron.

CONTRACTS made by the subscribers, agents for the manufacturers, for the delivery of Railway iron, at any port in the United States, at fixed prices, and of quality tried and approved for many years, on the oldest railways in this country.

RAYMOND & FULLERTON, 45 Cliff st.

JOHNSON, CAMMELL & Co's Celebrated Cast Steel,

AND ENGINEERING AND MACHINE FILES, which for quality and adaptation to mechanical uses, have been proved superior to any in the United States. Every description of square, octagon, flat and round cast steel, sheet, shovel and railway spring steel, best double and single shear steel, German steel, flat and square, goat stamps, etc. Saw and file steel, and steel to order for any purposes, manufactured at their Cyclops Steel Works Sheffield.

JOHNSON, CAMMELL & CO.,
100 William St., New York.

November 23 1849.

Bowling Tire Bars.

40 Best Flange Bars $5\frac{1}{2} \times 2$ inches, 11 feet long.
40 " " $5\frac{1}{2} \times 2$ " 7 feet 8 in. long.
40 " Flat " 6×2 " 11 feet long.
40 " " 6×2 " 7 feet 8 in. long.

Now in store and for sale by
RAYMOND & FULLERTON,
45 Cliff street.

IRONDALE PIG METAL, MANUFACTURED and for sale by the Bloomsburg Railroad Iron Co.
LINDLEY FISHER, Treasurer.
75 N. Water St., Philadelphia.

Railroad Iron.

2000 Tons, weighing 53 pounds per lineal yard, of the most approved pattern of T rails, in store and to arrive, for sale by
COLLINS, VOSE & CO.,
74 South St.

New York, June 1, 1850.

Railroad Iron.

3,000 TONS C. L. MAKE 63 $\frac{1}{2}$ lbs. per yard, now landing and to arrive.

Also contracts made for future delivery of above superior make English Iron.

300 Tons Banks Best Iron, Round, Square and Flat.
200 " English Bar " " " " "

10 " 9-16 Square Iron for Railroad Spikes.

For sale in lots to suit purchasers by
DAVID W. WETMORE.
New York, March 26, 1850. 3m

WILLIAM JESSOP & SONS' CELEBRATED CAST-STEEL.

The subscribers have on hand, and are constantly receiving from their manufactory,

PARK WORKS, SHEFFIELD,
Double Refined Cast Steel—square, flat and octagon.

Best warranted Cast Steel—square, flat and octagon. Best double and single Shear Steel—warranted.

Machinery Steel—round.
Best and 2d gy. Sheet Steel—for saws and other purposes.

German Steel—flat and square, "W. I. & S." "Eagle" and "Goat" stamps.

Genuine "Sykes," L Blister Steel.

Best English Blister Steel, etc., etc., etc.

All of which are offered for sale on the most favorable terms by
WM. JESSOP & SONS,
91 John street, New York.

Also by their Agents—

Curtis & Hand, 47 Commerce street, Philadelphia.
Alex'r Fullerton & Co., 119 Milk street, Boston.

Stickney & Beatty, South Charles street, Baltimore.
May 6, 1848.

Railroad Iron.

B. O. Railway Tires, Railway Wheels,
Scotch Pig Iron, Tin Plates and Banca Tin,
Muntz's Patent Metal Sheathing,
Baltimore Copper.

Contracts for Rails made on behalf of the manufacturers, for delivery at any ports in the United States, at fixed prices.

Bowling Tires and Tire Bars and Scotch Pigs imported to order.

Muntz's Ship-sheathing, and a general stock of Tin Plates and Banca Tin in store, and for sale by
RAYMOND & FULLERTON, 45 Cliff st.

Bowling Iron. Stamped B.O.

Railway Tire Bars Rivet Iron
Locomotive and other Axles Locomotive Frame do
Boiler Plates Bars,
and every other description of this superior Iron.

The subscribers, agents for the sale of Bowling Iron, are prepared to execute orders for importation, especially for railway and machinery uses, with despatch from the manufacturers.

RAYMOND & FULLERTON, 45 Cliff st.

Lovegrove's Patent Cast Iron Water and Gas Pipes.

THE Subscriber, the Inventor and Patentee of the Centrifugal mode of giving form to metallic substances while in a molten state, is preparing to make Cast Iron Water and Gas Pipes, of any dimensions, at prices much lower than they can be made in the old manner, and the pipes warranted to stand a pressure of three hundred pounds to the square inch, and to be soft enough to drill. Steam Engines and all kinds of machinery. Cast Iron Doors and Frames, and Mill Castings of every description, made to order.

THOMAS J. LOVEGROVE,
Machinist and Founder,
West Falls Avenue, below Pratt st., Baltimore.

Railroad Iron. SPIKES.

Wrought Iron CHAIRS, New Pattern.

THE Undersigned continues to contract, as usual, for the above articles. The reputation already acquired for their excellent quality is a guarantee that strict attention shall continue to be paid to the wants and interests of purchasers.

CHARLES ILLIUS,
20 Beaver St., New York.

Ray's Patent India Rubber Car Springs.

Savannah, Ga., May 22, 1850.

FOWLER M. RAY, Esq.,

Dear Sir: I have no hesitation in saying, after having used on our road your springs and Fuller's, that I consider yours decidedly the best in every particular, and in this opinion I am sustained by all our officers. Fuller's spring has a tendency to split, and also to chafe or abrade by the constant friction on the cast iron plates or disc: and in my opinion is not near so elastic as yours.

Your springs, which have been in use on our road for 12 or 15 months past, and in constant use under both passenger and freight cars, are to all appearances as elastic, sound and good, as when first put in use.

We are now building eighty-five new cars, of which for fifty-sets the springs have been ordered of you.

GEORGE A. ADAMS,

Master Carpenter,

Central Railroad and Banking Co. of Georgia.

Connecticut River Railroad Office, }
Northampton, May 4, 1850. }

E. CRANE, Esq.,

Dear Sir: It is now about two years since I first tried the experiment of using a set of Ray's India-rubber Springs upon one of our merchandise cars, and although the car has been in constant service since that time, I do not on examination find the slightest difference either in the thickness or elasticity of the material.


The same result has followed wherever we have applied them, either for wheel or draw springs on Engines, Tenders or Cars. At present we use no other; either in replacing old springs or building new cars—and I am perfectly satisfied that for economy, durability, safety, and ease of motion, that Ray's India-rubber is the best article for Springs which has been presented to the public.

Yours respectfully, J. HUNT,
Supt. Connecticut River Railroad.

EDWARD CRANE, Esq.,

Dear Sir: Having applied to cars of the Boston and Worcester Railroad Corporation, Ray's Vulcanised Rubber Springs (where they have been in use for some two years last past), I have had occasion to observe their operation, and am free to say in answer to your inquiries, that they retain their elasticity perfectly during all changes of atmospheric temperature: and are in my opinion a most valuable acquisition to Railroad Cars—are not liable to derangement, as is the case with steel springs; while at the same time it costs less to apply them. Respectfully yours,


D. N. PICKERING,
Supt. Motive Power, Bost. & Wor. Railroad.
Boston, April 15th, 1850.



EMERSON'S
PATENT
CORRESPONDING
VENTILATORS,

For Ships, Steamers, etc.,

Manufactured by
CHILSON, ALLEN, WALKER & CO.,
351 Broadway, New York.



TO RAILROAD COMPANIES, CAR MANUFACTURERS, etc.

THE Undersigned hereby gives public notice, that the Commissioner of Patents, pursuant to his decision in relation thereto, on the 8th day of October, 1850, issued to him a Patent for the sole right to manufacture, and exclusive use of the **INDIA RUBBER CAR SPRING**, on account of priority of invention of said Spring.

New York, Oct. 23, 1850.

RAILROAD CAR MANUFACTORY

TRACY & FALES,
GROVE WORKS, HARTFORD, CONN.

Passage, Freight and all descriptions of
RAILROAD CARS,

AS WELL AS
LOCOMOTIVE TENDERS,

Made to order promptly.

The above is the Largest Car Factory in the Union. In quality of Material, and in Workmanship, Beauty and Good Taste, as well as Strength and Durability, we are determined our work shall be unsurpassed.

JOHN R. TRACY. THOS. J. FALES.

Monument Foundry.

A. & W. DENMEAD & SON,
Corner of North and Monument Sts.,—Baltimore,
HAVING THEIR
IRON FOUNDRY AND MACHINE SHOP
In complete operation, are prepared to execute
faithfully and promptly, orders for
Locomotive or Stationary Steam Engines,
Woolen, Cotton, Flour, Rice, Sugar Grist, or Saw
Mills.
(Slide, Hand or Chuck Lathes,
Machinery for cutting all kinds of Gearing.
Hydraulic, Tobacco and other Presses,
Car and Locomotive patent Ring Wheels, war-
ranted,
Bridge and Mill Castings of every description,
Gas and Water Pipes of all sizes, warranted,
Railroad Wheels with best fagotted axle, fur-
nished and fitted up for use, complete
Being provided with Heavy Lathes for Bor-
ing and Turning Screws, Cylinders, etc., we can
furnish them of any pitch, length or pattern.
Old Machinery Renewed or Repaired—and
Estimates for Work in any part of the United States
furnished at short notice.
June 8, 1849.

**RAILROAD CAR
AND COACH TRIMMINGS.**
Doremus & Nixon,
IMPORTERS AND FURNISHERS

HAVE FOR SALE
Plain Garnet Plush. Fig. Garnet Plush (Butterfly pat.
"Crimson" "Crimson" "Elegant.
"Scarlet" " " " (Gen. Taylor.
BROCATELLES.
Crimson Silk Brocatelles. Gold and Maroon do.
Gold and Blue " " Brown " "
Silk and Wool " " of every color.
MOQUETTES,
Of elegant designs and colors.
GERMAN CLOTH FOR CAR LININGS.
The most beautiful goods ever shown in this coun-
try, and the subscribers are the sole agents for the sale
of them.
Oil cloths Enamelled with Gold. } These goods can be
" " Silver. } furnished in any
Do. Silver ground velvet printed. } dimensions req'd.
CURLED HAIR
Of every description and quality.
JNO. W. A. STRICKLAND, Agent.
New York, 1850. ly16

**FOWLER M. RAY'S
Patent India-rubber Railroad
CAR SPRING.**

New York and Erie Railroad Shops.
Piermont, March 26, 1850.

This will certify that from practical experience in
the use of Fowler M. Ray's India rubber Car Springs,
I believe them to be far superior to any others now in
use.

I have never known them to be affected by any
change of temperature, as other Rubber Springs have
been affected on this road.

I am at the present time repairing a Passenger Car
that Mr. Ray and myself mounted with his springs
about two years and eight months since.

The springs are at the present time as perfect, to all
appearances, as when first applied to the car.

Respectfully yours,

HORACE B. GARDNER,
Foreman of the Car Shops.

Supt. Office N.Y. & H. R.R., }
New York, March 8, 1850. }

This is to certify that we have used the Rubber
Springs manufactured by Mr. F. M. Ray for the past
twenty months, "both for Passenger and Freight Car
Springs and Bumpers, and of different sizes," and
have in every case given entire satisfaction, and I con-
sider them the best spring now in use.

M. SLOAT, Supt.

Boston, March 5, 1850.

In answer to your enquiry about India-rubber
Springs, I have to say that we have used them to a
considerable extent on both freight and passenger cars,
and also on several of our tenders; and I am very
well satisfied that they answer all the purposes for
which they are intended. I believe the India-rubber
will soon supersede all other springs for cars and ten-
ders. Yours truly,
S. M. FELTON,
Supt. Fitchburg Railroad.

Office New Jersey Railroad Co., }
Jersey City, March 8, 1850. }

FOWLER M. RAY, Esq.,

Dear Sir: In answer to your enquiries respecting
the operation of the Vulcanised Rubber Springs, pur-
chased by our company from you some two years
since, I reply that they are superior to any spring in
use, (that I have either seen or heard of).

The improved form of your spring, consisting of a
solid piece of vulcanised rubber with bands on the out-
side, is far superior to your first form, consisting of
disks of rubber with metallic plates interposed.

The last named form was tried, if you recollect, at a
much earlier period; and then was replaced by your
last form.

I have no hesitation in saying that your springs
have given entire satisfaction, and most cheerfully re-
commend them to railroad companies throughout the
country for the following reasons:

1st. The cost is 30 per cent. less.

2d. Saving of weight on each car of 8 wheels from
700 to 500 lbs.

3d. Less care and attention is required, as they are
not liable to get out of repair.

4th. A great saving is secured in the wear and tear
of the cars and rails from their great elasticity.

5th. The freedom from noise.

6th. There is greater safety in case of accident, as
they cannot be broken.

7th. The comfort of passengers is enhanced suffi-
ciently to pay the expense, waiving all the other rea-
sons that I have given.

Should this fail to satisfy any person enquiring, you
are at liberty to refer to me, No. 150 Washington St.,
Jersey City. Yours respectfully,

T. L. SMITH, Supt.

New York, March 11, 1850.

I have used the Patent India-rubber Spring pur-
chased of Mr. Ray, upon the cars of the New York
and New Haven Railroad, and have found them effi-
cient and economical; and when applied to the axles
and draw springs, believe them to be quite equal to
any in use. I have found a combination of these
springs with a steel spring under the transom beam a
very satisfactory arrangement, and am now using this
plan in all new cars. Yours respectfully,

ROBERT SCHUYLER.

February 25, 1850.

From practical observation of the use of the India-
rubber Car Springs, manufactured and sold by your
company, we are entirely satisfied in their application,
and do not hesitate to recommend them as elastic, du-
rable, requiring no repairs for years, and retaining
their consistency during all extremes of weather. We
have applied them for the past two years, and consid-
er them superior for all railroad purposes.

Yours truly,

OSGOOD BRADLEY, Car Builder, Worcester.
T. & C. WASON, do. Springfield.
DEAN, PACKARD & MILLS, do. do.
DAVENPORT & BRIDGES, do. Cambridgeport.

Office of the New Jersey Railroad Co., }
Jersey City, March 7, 1850. }

This is to certify that we have had Mr. F. M. Ray's
India-rubber Springs in constant use under our cars,
and as Bumper Springs for upwards of two years, and
they have in every way given perfect satisfaction.

The present form of spring we deem far superior to
the form of Disk, having used both forms, although
we have none of those made in Disks at present in use.

We take pleasure in recommending these springs to
all railroad companies.

J. P. JACKSON, Vice Prest.
New Jersey Railroad and Trans. Co.

Roxbury, February 23, 1850.

In compliance with your request, I take great plea-
sure in stating the result of my experience in the use
of "Ray's Patented Vulcanised India-rubber Car and
Engine Springs." We have used them nearly two
years, and never had one fail in any way. The cold
weather does not affect them, as it has other rubber
springs we have used.

With sixteen years' experience as superintendent of
machinery on the Boston and Providence railroad, I
take pleasure in saying that your springs are the best
we ever used, or I ever saw used elsewhere. We have
20 cars rigged with them, of which I can say that the
springs are as good now as when first applied. I put
24 lbs. of the rubber under the forward end of one of
our heaviest engines, taking off 250 lbs. of steel springs
—it has been in use 18 months, and is in as good con-
dition now as when first put under the engine.

Very respectfully yours,

GEO. S. GRIGGS,
Supt. of Machinery, Boston and Prov. R.R.

Fall River, February 2, 1850.

In answer to yours of the 20th ult. I would say that
this company has for some 10 or 12 months past been
using "Ray's India-rubber Springs." We have ap-
plied them to both passenger and freight cars with
uniform success. They have invariably preserved
their elasticity and consistency through all the ex-
tremes of weather; and we are now applying them
whenever the steel spring fails. I am well satisfied
that they are particularly adapted for railroad purposes.

Very respectfully yours,

GEO. HAVEN,
Supt. Fall River Railroad.

Jersey City, March 9, 1850.

This is to certify that the present form of Mr. F.
M. Ray's India-rubber Car Spring I consider far su-
perior to the form of Disk, having used both forms.

I take pleasure in recommending these springs to all
railroad companies. **DAVID H. BAKER,**
Foreman of Car Shop of N.J. R.R. & Trans. Co.

Harlem R.R. Depot, }
New York, March 7, 1850. }

This is to certify that we have used Mr. F. M. Ray's
India-rubber Springs for over eighteen months, and
find them to be easy and durable, and recommend them
to railroad companies as being superior to anything we
have tried.

J. M. SMART,
Foreman at 42d St. Depot.

Old Colony Railroad Office,
Boston, March 6, 1850.

EDWARD CRANE, Esq.,

President New England Car Co.,
Dear Sir: In compliance with your request I would
state that the Old Colony Railroad Comp'y have had
in use upon their road, India-rubber Springs furni-
shed by your company, for more than eighteen months
past, during which time they have been extensively
used under Passenger and Freight Cars, Locomotive
Tenders, and for Drawer and Buffing Springs, with
the most perfect success. The elasticity and consi-
stency of the Rubber has never been unfavorably affect-
ed by either extremes of heat or cold—and from the
experience which we have had in the use of Rubber
Springs, I think them well adapted for railroad pur-
poses—and therefore we have for some months past
used Rubber almost exclusively, in all places where
springs are required.

Respectfully yours, etc.,

JAS. H. MOORE,
Supt. O. C. Road.

Troy, February 27, 1850.

We have been using your India-rubber Car Springs
for nearly two years—and we take pleasure in saying
that in our opinion the rubber has to a certain extent
already, and may eventually entirely supersede all
other Springs for Railroad Car purposes. We now
use it entirely for Draw Springs and Bumpers, con-
sidering it better and lighter than steel.
During our two years' experience in the use of it,
we have not known any to lose their elasticity, or fail
in any way; and we cheerfully recommend the rub-
ber for railroad car springs. Very respectfully,
EATON, GILBERT & CO.

Passenger Car Linings.

THE Advertiser continues to make to order the
Enamelled Car Linings which have been so high-
ly approved the last three years, and are now exclu-
sively used by all the Northern Railroads. No pains
are spared to get out new styles, and adapt them to
the tastes of every consumer.

Orders addressed to **CHARLES STODDER, No.**
75 Kilby street, Boston, will have prompt attention.
March 23, 1850. 2m

India-rubber for Railroad Cos.

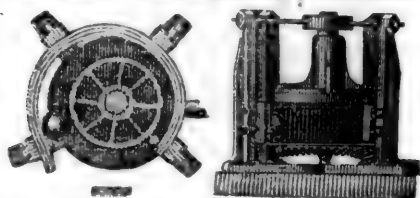
**RUBBER SPRINGS—Bearing and Buffer—Ful-
ler's Patent—Hose from 1 to 12 inches diameter.
Suction Hose. Steam Packing—from 1-16 to 2 in.
thick. Rubber and Gutta Percha Bands. These ar-
ticles are all warranted to give satisfaction, made un-
der Tyer & Helm's patent, issued January, 1849.—
No lead used in the composition. Will stand much
higher heat than that called "Goodyear's," and is in
all respects better than any in use. Proprietors of rail-
roads do not be overcharged by pretenders.**

HORACE H. DAY,
Warehouse 23 Courlandt street.

New York, May 21, 1849.

Spikes, Spikes, Spikes.

ANY person wishing a simple and effective Spike
Machine, or a number of them, may be supplie
by addressing
J. W. FLACK,
March 6, 1850. Troy, N. Y.

MACHINERY.**Henry Burden's Patent Revolving Shingling Machine.**

THE Subscriber having recently purchased the right of this machine for the United States, now offers to make transfers of the right to run said machine, or sell to those who may be desirous to purchase the right for one or more of the States.

This machine is now in successful operation in ten or twelve iron works in and about the vicinity of Pittsburgh, also at Phoenixville and Reading, Pa., Covington Iron Works, Md., Troy Rolling Mills, and Troy Iron and Nail Factory, Troy, N. Y., where it has given universal satisfaction.

Its advantages over the ordinary Forge Hammer are numerous: considerable saving in first cost; saving in power; the entire saving of shingler's, or hammerman's wages, as no attendance whatever is necessary, it being entirely self-acting; saving in time from the quantity of work done, as one machine is capable of working the iron from sixty puddling furnaces; saving of waste, as nothing but the scoria is thrown off, and that most effectually; saving of staffs, as none are used or required. The time required to furnish a bloom being only about six seconds, the scoria has no time to set, consequently is got rid of much easier than when allowed to congeal as under the hammer. The iron being discharged from the machine so hot, rolls better and is much easier on the rollers and machinery. The bars roll sounder, and are much better finished. The subscriber feels confident that persons who will examine for themselves the machinery in operation, will find it possesses more advantages than have been enumerated. For further particulars address the subscriber at Troy, N. Y.

P. A. BURDEN.

Railroad Spikes and Wrought Iron Fastenings.

THE TROY IRON AND NAIL FACTORY, exclusive owner of all Henry Burden's Patented Machinery for making Spikes, have facilities for manufacturing large quantities upon short notice, and of a quality unsurpassed.

Wrought Iron Chairs, Clamps, Keys and Bolts for Railroad fastenings, also made to order. A full assortment of Ship and Boat Spikes always on hand.

All orders addressed to the Agent at the Factory will receive immediate attention.

P. A. BURDEN, Agent,
Troy Iron and Nail Factory, Troy, N. Y.

CHILLED RAILROAD WHEELS.—THE Undersigned are now prepared to manufacture their Improved Corrugated Car Wheels, or Wheels with any form of spokes or discs, by a new process which prevents all strain on the metal, such as is produced in all other chilled wheels, by the manner of casting and cooling. By this new method of manufacture, the hubs of all kinds of wheels may be made whole—that is, without dividing them into sections—thus rendering the expense of banding unnecessary; and the wheels subjected to this process will be much stronger than those of the same size and weight, when made in the ordinary way.

A. WHITNEY & SON,
Willow St., below 13th,
Philadelphia, Pa.

Brown's Old Established SCALE WARE HOUSE,
NO. 234 WATER ST., NEW YORK.

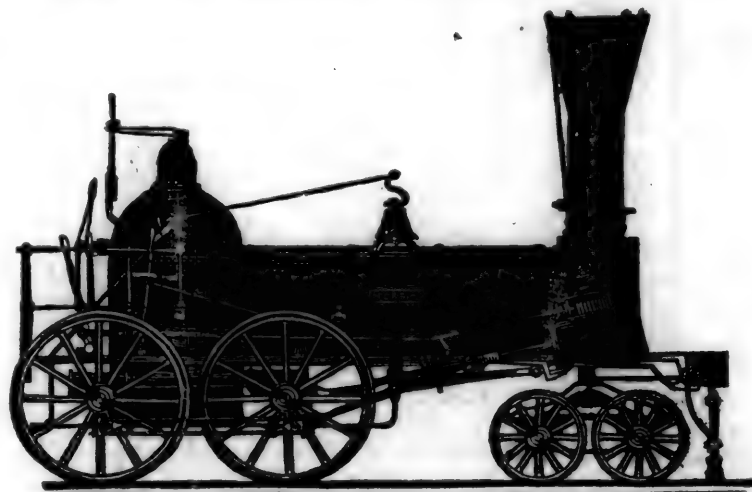
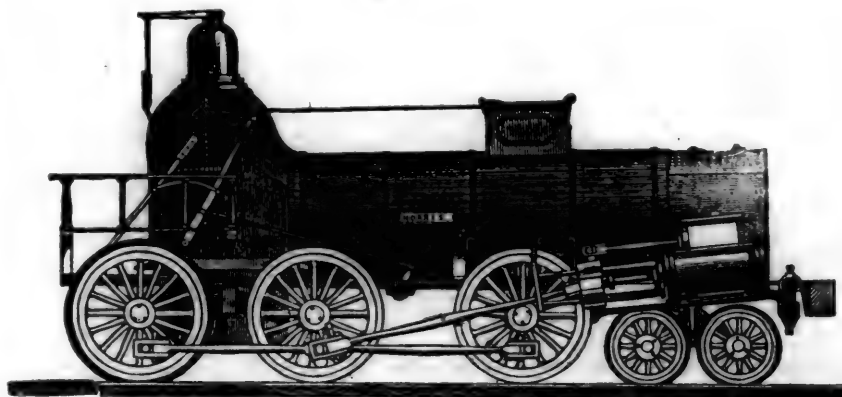
THE Subscriber, Practical Manufacturer of Scales of every description, respectfully asks the attention of Railroad Companies to his Improved Wrought Iron Railroad Track and Depot Scales which for strength, durability, accuracy, convenience in weighing, and beauty of workmanship, are not surpassed by any others in this country.

He is aware that this is rather a bold assertion for him to make, yet he can say with confidence that they have but to be tried to give them precedence over all others.

J. L. BROWN.

Bank Scales made to order, and all Scales of his make Warranted in every particular.

Referer given if required.

NORRIS' LOCOMOTIVE WORKS.
BUSHHILL, SCHUYLKILL SIXTH-ST., PHILADELPHIA,

THE UNDERSIGNED Manufacture to order Locomotive Steam Engines of any plan or size. Their shops being enlarged, and their arrangements considerably extended to facilitate the speedy execution of work in this branch, they can offer to Railway Companies unusual advantages for prompt delivery of Machinery of superior workmanship and finish.

Connected with the Locomotive business, they are also prepared to furnish, at short notice, Chilled Wheels for Cars of superior quality.

Wrought Iron Tyres made of any required size—the exact diameter of the Wheel Centre, being given, the Tyres are made to fit on same without the necessity of turning out inside.

Iron and Brass castings, Axles, etc., fitted up complete with Trucks or otherwise.

NORRIS, BROTHERS

PATENT MACHINE MADE HORSE-SHOES.

The Troy Iron and Nail Factory have always on hand a general assortment of Horse Shoes, made from Refined American Iron.

Four sizes being made, it will be well for those ordering to remember that the size of the shoe increases as the numbers—No. 1 being the smallest.

P. A. BURDEN, Agent,
Troy Iron and Nail Factory, Troy, N. Y.

Etna Safety Fuse.

THIS superior article for igniting the charge in wet or dry blasting, made with DUPONT'S best powder, is kept for sale at the office and depot of

REYNOLDS & BROTHER,

30 So. Manufacturers, N.Y.

No. 85 Liberty St.

NEW YORK.

And in the principal cities and towns in the U. States.

The Premium of the AMERICAN INSTITUTE was awarded to the Etna Safety Fuse at the late Fair held in this city.

November 3, 1849.

1y

**COLUMBUS, OHIO,
Railroad Car Manufactory.
RIDGWAYS & KIMBALL,**

HAVE established at this central point, the manufacture of Passenger, Freight, Gravel and Hand Cars for Railroads, and assure all Western Railroad Companies that it will be their constant aim to procure the best materials and workmen, and to turn out the best kind of work at fair prices. Specimens may be seen on the Columbus and Xenia Railroad. The patronage of Railroad Companies is respectfully solicited.

1y8

FOR SALE.

THREE LOCOMOTIVES, Manufactured by M. W. Baldwin, of 10 tons weight, all in complete repair, and now running on the Columbia and Philadelphia Railroad.

For particulars apply to A. L. Roumfort, Supt. of said road, either at Philadelphia, or Parkersburg, Chester county.

A. L. ROUMFORT,
Supt. Motive Power Col. & Philad. R.R.

AMERICAN RAILROAD JOURNAL.

STEAM NAVIGATION, COMMERCE, MINING, MANUFACTURES.

HENRY V. POOR, Editor.

ESTABLISHED 1831.

PUBLISHED WEEKLY, AT No. 136 NASSAU ST., NEW YORK, AT FIVE DOLLARS PER ANNUM IN ADVANCE.
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ASSISTANT EDITORS,

J. T. HODGE, *For Mining and Metallurgy.*
GEN. CHAS. T. JAMES, *For Manufactures and the Mechanic Arts.*

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American Railroad Journal.

PUBLISHED BY J. H. SCHULTZ & Co., 136 NASSAU ST.

Saturday, December 14, 1850.

Ocean Steam Navigation.

European and North American Railway.

The steamer *Arctic* brought information that the British Government has ordered a Commissioner to report as to removing the transatlantic mail station from Liverpool to the western coast of Ireland. The Liverpool Chamber of Commerce is in arms against it, and endeavors to cause great facilities to be given to the American trade and shipping of the port.

The completion of the railway to Galway in 1851 may produce the most important changes in the commercial intercourse between the two continents.

The project of the European and North American railway assumed that a speed of 17 miles an hour in ocean steamers might at some future time be attained.

The question is engaging great attention in Great Britain and the United States.

We have recently received a copy of the "Advocate, or Irish Industrial Journal," in which the matter is referred, and the navigation from Holyhead to Dublin is carefully considered, which we

know will interest all parties connected with ocean navigation, and gladly transfer it to our columns.

THE HOLYHEAD AND DUBLIN STEAMERS.

Most persons are aware that the passage between Holyhead and Dublin was one of the first selected by the early promoters of steam navigation for their experiments on the open sea; and it is not a little interesting to those who, like myself, take an interest in the subject, to review its past history, and note its present state on this station. The distance from Holyhead to Howth, the original Irish packet station, is 54 miles; to Kingstown, the present one, 63. A passage better calculated to test the qualities of a sea-going steamer could not be chosen, for at times a more turbulent sea does not exist than is experienced on it. This is principally owing to the strong tides, the force of which is chiefly felt in the neighborhood of the Welch coast. The spring tides here are known to run at the rate of six miles an hour. One of the captains of the old sailing packets, in his evidence before a committee of the House of Commons, in 1822, stated, "I do not think I ever saw a more difficult channel to navigate, and I think I have now been 40 years at sea."

In 1819, David Napier placed on the station the *Talbot*, of 156 tons, built by Wood, of Port Glasgow, and fitted with two engines of the collective power of 60 horses, by himself. This was the first attempt, but though he may have continued running his vessels on other lines through the winter, it is certain that the *Talbot* did not ply for more than the summer and autumn of that year. In the following year, 1820, Napier placed another vessel, the *Ivanhoe*, of 158 tons, built by Scott, of Port Glasgow, with engines of 56 horse power, by himself, on the same line; but I cannot find that either this or the *Talbot* ran regularly throughout the year. Enough, however, was done to induce the postmaster general, who then managed the packet service, to take the matter up; and in 1821, steamers were regularly introduced between Howth and Holyhead for the conveyance of the mails, and partly superseded the old sailing packets. The *Ivanhoe* was purchased for this purpose, and two other steam vessels ordered to be built; these were the *Royal Sovereign*, of 200 tons, and the *Meteor*, of 190 tons; they were constructed by Evans, of Rotherhithe, under the direction of Oliver Lang, the master shipwright of Woolwich dockyard, on the diagonal principle. It is a little singular that 27 years later, almost on the same spot, on the same principle, and from the design of the no less celebrated son (O. W. Lang), was built the *Banshee*. The *Royal Sovereign* and *Meteor* proved very successful vessels, and so important was strength then considered that, excepting the discovery ships, Lang declared he knew of none stronger. The engines of each were made on the beam principle, by Boulton and Watt—the power of the *Sovereign* being 80, that of the *Meteor* 60: and it

is curious now to find the commander of the former vessel, in his evidence before the Commons Committee of 1822, giving it as his opinion that, if anything, she was overpowered. We find it stated elsewhere in the same evidence, that the *Sovereign's* consumption averaged 8 cwt., and the *Meteor's* 5 cwt. of coals per hour, while the *Talbot* and the *Ivanhoe* used as much as 14 cwt. each in the same time.

In every other respect, the *Sovereign* and *Meteor* proved themselves the best vessels on the line.—From a Parliamentary return, the following particulars of the performances of the different packets for one year, viz: from June 1, 1821, to June 1, 1822, are extracted:

Vessel.	No. of passages.	Average passage to Howth.	Average passage to Holyhead.	Shortest passage to Howth.	Shortest passage to Holyhead.	Longest passage to Howth.	Longest passage to Holyhead.
Royal Sovereign	143	7-39	7-02	5-48	6-00	16-04	12-50
Meteor	147	8-16	7-17	6-15	5-30	17-20	23-10
Talbot	16	9-24	8-03	.....	.....	.....	.....
Ivanhoe	6	11-57	6-38	.....	.....	.....	.....
Tartar	20	15-27	9-48	.....	.....	.....	.....

NOTE.—The *Tartar*, of 180 tons, with engines of 60 horse power, by Cook, of Glasgow, on the horizontal plan, was used by the government as an experimental vessel, a Mr. Broderip being employed to make the machinery auxiliary to a sailing vessel, but without success. We find that in this year [the last of the sailing packets] they made in all 46 voyages, averaging 15 hours 2 minutes to Howth, and 14 hours 13 minutes to Holyhead.

In 1824 the *Sovereign* and *Meteor* were withdrawn from the station, and the *Aladdin*, *Cinderella* and *Harlequin*, put in their places. All these vessels were, I believe, built in London, and their engines from Boulton and Watt's factory. They were all nearly of the same dimensions; the tonnage of each was 234, and the power 80 $\frac{1}{2}$ afterwards in 1831, increased to 100. The following are the dimensions, etc., of the *Cinderella*, built in 1823, by Wigram & Co., Blackwall:

	Feet.	In.
Length over all.....	119	9
Ditto between perpendiculars.....	116	6
Extreme breadth.....	37	10
Depth.....	12	6
Diameter of cylinder.....	35	6
Length of stroke.....	3	6
Diameter of wheel.....	13	2
Horse power.....	80	

Three other vessels—the *Escape*, *Wizard* and *Dragon*—of the same class, were subsequently added. The Parliamentary returns state that the

shortest voyage made by any of these vessels in 1830, was in 5 hours 26 minutes; and in 1831, 5 hours 14 minutes. The average of the quickest vessel, the *Harlequin*, previous to the alterations in her engines, was to Howth, 7 hours 20 minutes; to Holyhead, 6 hours 22 minutes; and the consumption of each in 1826, is stated as under:

	Cwt.	lbs.
Aladdin, per hour.....	14	68
Cinderella ".....	11	94
Harlequin ".....	11	42
Escape ".....	11	55
Wizard ".....	13	107
Ivanhoe ".....	9	12

These vessels were in time superseded by others, but until 1848 no material change took place in the class employed; and the average time occupied in the passage, after Knightstown was substituted for Howth as a packet station, in 1828, may be given as 6 hours. The establishment of another line of mail packets, in 1826, between Kingstown and Liverpool, materially interfered with the Holyhead traffic; and after the opening of the railway to Liverpool in 1838, it almost ceased, although four boats still continued to ply.

Such was the state of things until 1848, when the partial completion of the Chester and Holyhead railway promised a restoration of much of the old traffic to its former route. The four obsolete admiralty packets were transferred to other stations, and their places supplied by others, of a class hitherto unknown. The railway company had obtained powers, though not till after a severe struggle, to run steamships in connection with their trains, and had ordered the construction of four of a class fully equal to those of the government. It is not my province to discuss—which has already been pretty fully done—the question of the propriety of the government becoming competitors with a company, who had already incurred such enormous liabilities in their endeavors to effect a truly national undertaking, and bring Dublin within an easy 12 hours' distance from the metropolis; I merely look upon the fact of eight steamships, constructed by the most eminent builders and engineers in London and Liverpool, as a very interesting one, and which enables us to judge of the progress made in these departments of science in the two places. The admiralty vessels were first in the field, and the earliest launched was the *Caradoc*, in the autumn of 1847. She was constructed of iron, by the late firm of Ditchburn & Mare, Blackwall, from the designs of Sir Wm. Symonds, the Surveyor of the Navy; and her engines on the direct action principle, by Seaward & Co. Her tonnage is 662, and her power 350. This vessel did not, on her trial trip in the Thames, realise the expectations formed of her, nor has she proved by any means among the best of the Holyhead boats. The next on the list is the *Banshee*, built of wood, chiefly mahogany, by Thompson, of Rotherhithe, and her engines [oscillating] by Penn & Son, Greenwich; she, as before stated, was constructed from the designs of O. W. Lang.

The *Banshee* had several rivals; but I believe I may say, that for beauty she is admitted by all to be unequalled. She was launched at the close of 1847, and in January, 1848, her trial trip took place. On that occasion her performances exceeded anything before realized, her average speed being 18½ statute miles per hour; with wind and tide she went 21 miles per hour, and against ditto, 18; or the measured mile in the Thames, in 3 minutes 15 seconds, and 4 minutes 20 seconds, respectively.

The *St. Columba*, of iron, by Laird, of Birkenhead, and engines by Forrester, of Liverpool, was next ready for sea; and the Holyhead railway not being as yet open, she, with the *Banshee*, was placed, in March, for a short time, on the line between Kingstown and Birkenhead. A trial trip took place early in the month between the two vessels, when, in the run from Liverpool to Kingstown the *Banshee* beat her competitor by one hour exactly. On one occasion the *Banshee* made the passage, 130 miles, in 7 hours 7 minutes; and when employed, in the summer of 1848, to convey Lord John Russell to Glasgow, she made the run from Kingstown in 12 hours—a remarkable performance. Wise people, however, shook their heads and said, "Wait till the winter comes, and see how she and the others will behave." The winter came, and

with it many a hard gale, but the *Banshee* behaved right well, if not the best of all and at the present time she shows no diminution of speed, and is generally but little the worse for the hard work she has gone through. The *Llewellyn*, of iron, with oscillating engines by the same parties who built her, Miller & Ravenhill, of Blackwall, came upon the station in August, 1848, when the Holyhead railway was opened. Great expectations were formed of her, nor were they altogether unfulfilled. On her trial trip she averaged 17·89 miles per hour, and her subsequent performances rank her next to the *Banshee* in speed. A great deal has been said about this vessel's capabilities, and her performances have been, by interested parties strenuously puffed—but when it appears on a close examination, that she has, with the exception of the *Caradoc*, performed less work than any of the rest, and cost far more for repairs, there is surely small room for boasting here.

In August, 1845, and September, the Chester Railway Company's steamers—*Anglia*, *Cambria*, *Hibernia*, and *Scotia*—commenced running. The whole of these vessels are of iron; the *Anglia* was built by Mare, of Blackwall, engines by Maudslay, on the double-cylinder principle; the *Cambria*, by Laird, of Liverpool, engines by Forrester; the *Hibernia*, by Vernon, of Liverpool, engines by Bury; and the *Scotia*, by Wagram, of Blackwall, engines (double-cylinder) by Maudslay.

The service performed by the Admiralty and railway boats, in their first introduction in 1848, was pretty similar, being confined to one passage each way daily.

The former conveyed the daily mail from Dublin, and the night one from London; and the latter, by leaving Kingstown early in the morning, enabled passengers to reach Holyhead in time for the afternoon express-train, which arrives about 11 P. M., in London. The same vessel awaited the arrival of the down express-train from London, and was generally due at Kingstown about 10·30 P. M. Since the completion of the Britannia-bridge, the arrangements of the company have been slightly altered, but up to the present time no material alteration has been effected. It should, however, be observed, that while the Admiralty have allowed 5 hours 35 minutes, and 5 hours 55 minutes for their vessels to complete their passage in, the Railway Company have limited theirs to 5 hours 5 minutes, and I believe that the instances in which they failed to arrive at Holyhead in time for the train, are not more numerous than the Government ones.

In July, 1849, the discontinuance of the night mail, via Liverpool, and its transference to the Holyhead station, necessitated a double passage each way, and the work performed by the Admiralty steamers, became in consequence, much heavier, and in winter time occasionally of a very difficult character.

The speed of the *Banshee* may yet be reached by ocean steamers from Galway to Canso.

In connection with this matter, we take pleasure in transferring the following from the *Morning Chronicle*, of October 31st, in reference to the plan for shortening the time of passage between New York and London.

The *Chronicle* is the present ministerial organ, and its reference to the question in connection with the recent movements, to establish a steamship terminus on the west coast of Ireland, has more than ordinary significance.

We have only to hope that Nova Scotia will not falter in the work, or abandon the plan adopted at the Portland Convention.

[From the *London Chronicle*, Oct. 31.

THE EUROPEAN AND NORTH AMERICAN RAILWAY.

The great importance of this project, or any other based upon the same principle, to the United States, is so evident that it does not require further notice, but to the British provinces and in connexion with them to Great Britain, the advantages are so vast, that it may not be out of place to point out where, and in what way, they may be best employed. The railway, as proposed, will extend to Waterville, in the State of Maine, from thence by way of

Portland to Boston, New York, and other Cities in the United States now connected by railways, thus affording a rapid and uninterrupted transit, from the extreme point of Nova Scotia, on the Atlantic, to the shores of the Mexican Gulf. This will be of mutual advantage to the commercial relations between Great Britain and the United States. But the establishment of a railway communication between the landing point in Nova Scotia and Canada, by way of New Brunswick, is of political importance to Great Britain and her colonies that can hardly be estimated. The railway made once to the borders of Nova Scotia, or into New Brunswick, can be extended, if needed, direct to Canada, without entering the United States—thus securing a transit through a British territory for all political, or, if necessary, commercial purposes, though this it is to be hoped, will never be required by any disturbance of the peace between the two countries. On the contrary, this communication between the citizens of the United States and British subjects, for the promotion of commercial enterprise to which war has, and always will be destructive, cannot but promise additional security, by the tie of common interest for its maintenance.

The convention appears to have selected Galway, on the west side of Ireland, and Whitehaven, Cape Canso, Nova Scotia, for packet stations. The distance between the two ports is about 2000 miles, and assuming a speed of 17 miles an hour for steam vessels, the Atlantic can be crossed from point to point in five days. Thus by a railway from New York to Halifax, or Canso, by a fast steam packet, from thence to Galway, crossing by the great midland railway from Galway to Dublin, from thence to Holyhead, and from Holyhead to London, the passage from New York to London may be reduced to seven days time, employing about 1200 miles of a railway and 2000 miles of steam navigation.

The packets employed should be used for passengers and mails only, carrying as little weight as possible. Vessels designed for crossing the ocean with speed should not carry merchandize. Screw vessels will carry emigrants occupying only a few days longer on the voyage, and by using the railways, place them at their destination in one-third the usual time occupied. The movement in favor of this railway has been strengthened by the assistance given by our own government to the Midland Great Western Railway of Ireland, from Dublin to Galway, and to the general interest now shown them in the selection of some port in the south or west of Ireland for a packet station to America. Of the advantages Ireland would derive from such an establishment, an estimate can hardly be formed; but to make her the highway and place of embarkation to and from the New World, for the tens of thousands who annually cross the Atlantic, must bring advantages that will materially aid in rescuing her from the misery and degradation under which her people are now suffering. The project has been taken up warmly both in the United States and in the British Provinces, and parties of respectability have offered to take large amounts of stock.—The members of the several legislatures have promised to advocate the grant of public lands and other assistance by the States through which the railway will pass, and it is to be hoped that the promoters may find any appeal they may make in this country, either to the government for countenance, or to the public for assistance, receive the attention it deserves.—From all that is shown it promises well as an investment for capital, but that it is an undertaking of great importance, both politically and commercially, is beyond contradiction. It may interfere with the particular interests of companies now established, and may divert some portions of trade from the present channels; but the British provinces and consequently the mother country, will be great gainers if this enterprise is accomplished, and in this sense the public will value it.

The Great Tunnel on the Baltimore and Ohio Railroad in Preston Co., Va., is said to be progressing with great rapidity. The Contractors, Mears, Lemon, German and Clarke & Co. work 360 hands during twelve hours of the day, and have already penetrated about 3,100 feet, or more than half the distance.

Internal Improvements of the State of New York.

A SKETCH OF THE RISE, PROGRESS, AND PRESENT CONDITION OF INTERNAL IMPROVEMENTS IN THE STATE OF NEW YORK.

Continued from page 770.

In his annual message, in January, 1827, Mr. Clinton called the attention of the Legislature to the question of internal improvements by the general government. "It has become a question of great moment," says the message, "whether the general government has power, with or without the consent of the state governments, to construct canals and roads in their territories, and whether such power, if not already vested, ought not to be granted? High authorities are to be found on both sides of this question; and after devoting to it all the consideration which, from its importance, it is entitled, I think it due to a sense of duty and a spirit of frankness, to say, that my opinion is equally hostile to its possession by, or its investment in, the national authorities. I can perceive it in nothing less than the harbinger of certain destruction to the state governments." He, however, expressed an opinion favorable to the distribution of any surplus to the state governments, to be used by them for internal improvements.

At the time this was written, the general government, on the recommendation of Mr. Adams, was about embarking in an extensive scheme of internal improvements. And at the preceding session of our Legislature, Mr. Wright had introduced a resolution into the Senate, declaring "that the power to appropriate the funds or moneys of the Union, to the construction of roads, canals, and other internal improvements, through the respective states, is not vested in Congress by the Constitution of the United States;" and it protested against the exercise of the power until it is expressly given.

Mr. Clinton gives his views in regard to the canal fund, and the payment of the canal debt, as follows:—"By the Constitution, this fund cannot, nor ought it, to be diverted from its designated object. This state has derived great reputation from its enterprise in undertaking, and its perseverance in executing, a work of immense benefit, and it ought to set another example of the extinguishment of a great public debt. This precedent will be more beneficial in itself, and more animating in all its aspects and consequences, than any fugitive or even permanent advantages that can emanate from another course."

The tolls for 1826, the first year after the completion of the Erie Canal, were, on that canal, \$677,466 75—on the Champlain, \$84,536 83. The quantity of property passing towards tide water, below the junction of the two canals, near Cohoes, was 269,795 tons. Merchandise ascending from West Troy, 31,639 tons: total, ascending and descending, 391,434 tons. Increase from the preceding year, 82,360 tons.

The total quantity of property passing Utica, east and west, in the navigation season of 1827, was 194,091 tons, of which 24,439 tons was merchandise. In 1828, the quantity was 214,110 tons, 33,348 tons being merchandise. Owing to the failure of the wheat crop in 1828, the decrease in the wheat and flour compared with 1827, was estimated by the collector at Utica, to be equal to 1,100,000 bushels of wheat, causing a reduction of \$75,000 of toll.

There came to Albany on the canal in 1828, 236,904 tons, and there passed through the side-cut to Troy, 56,443 tons; total coming to tide water, 293,347 tons. The merchandise and other articles going from tide water amounted to 56,792 tons; total, ascending and descending, 350,139 tons.

The completion of the Erie and Champlain Canals was followed by immediate applications to the Legislature for the construction of other canals in almost every section of the state. The estimates of the public officers that the revenues of these great and expensive works would pay for their construction in ten years, afforded the applicants for extending the system, arguments too powerful to be resisted by the ordinary defences set up in behalf of the treasury.

At the commencement of the works for connecting the lakes with the Atlantic, and for several years during their progress, a strong opposition existed, and it was important that the annual reports

should show that, so far as these canals were concerned, the revenues set apart were sufficient for the payment of interest and the ultimate reimbursement of the principal of the canal debt. This embraced the canal system as contemplated by the act of 1817, and it was not incumbent on those entrusted with the management of the canal finances to anticipate that new works would be undertaken without the adoption of an equally safe system of finance. But when applications were presented for thirteen hundred miles in extent of canals and roads, it became the duty of the canal and finance committees, to show to the people and their representatives, the important facts, that the Erie and Champlain Canals, at the time of their completion, had been aided by auxiliary funds to an amount equal to one-third of the cost of their construction; and that in borrowing money for new canals and roads, the state had no more resources which could be set apart for the payment of interest or principal. It was obvious, also, that the Erie and Champlain Canals, connecting extensive navigable waters, possessed advantages for the accumulation of revenue, which could not be realised by the construction of canals elsewhere. If these canals, thus favorably situated, and aided by the five millions of extra revenues, could pay for themselves in ten years, it was not fair to infer, as was done by the advocates for new works, that the state might safely embark in a system for the construction of seven or eight hundred miles of canals, and anticipate the same favorable results, when the routes possessed none of the advantages of the Erie Canal, and when there was no auxiliary funds to aid any of them.

It was to correct erroneous impressions, and under a strong conviction that the financial system adopted by the act of 1817 must be adhered to in order to preserve the credit of the state untarnished, that Mr. Wright, then chairman of the canal committee of the Senate, made his celebrated report in 1827, on the petition for a canal from Olean to the Erie Canal. The advocates of an extended system of roads and canals, and particularly interested parties, regarded this report as a measure of deliberate hostility to internal improvements; but it was in all respects a truthful exposition of the financial condition of the state, and only insisted on such a system as should make the progress of internal improvements subordinate to the condition of the finances. Instead of being opposed to the system of internal improvements generally, Mr. Wright, who took his seat in the Senate in January, 1824, had voted for all the appropriations for finishing the Erie and Champlain Canals, and the Oswego, and Cayuga and Seneca Canals. The Oswego Canal was aided by an appropriation of lands in the Onondaga Salt Springs Reservation, which has yielded \$213,000. The Cayuga and Seneca Canal, which cost \$237,000, had no aid from auxiliary funds, but the route for its construction was very favorable, and it connected the Erie Canal with about seventy miles of navigation in the Cayuga and Seneca Lakes.

The report of Mr. Wright, after reviewing the condition of each of the state funds, and showing that, after giving the unappropriated lands to the school fund, as had been done by the Constitution of 1821, and the auction and salt duties to the canal fund, by the act of 1817, and the discontinuance of the half mill tax in 1826, there was a deficit of \$96,750 in the revenues of the general fund to meet the annual expenses, came to the following conclusion:—

"From these facts the conclusion is irresistible, that the state has not the means of appropriating an auxiliary fund for the construction of the canal now before the committee; that without such auxiliary aid, the means for its construction must be obtained upon the public credit entirely, and the money to pay the interest upon the debt so created, must also be borrowed." And as the committee were not satisfied that the prospect of revenue on this canal would justify its construction at the public expense, they reported against it. Mr. Colden, one of the earliest and most ardent friends of internal improvements, was on the committee, and concurred with Mr. Wright in the conclusions of the report, and he himself made a report at the same session, against commencing the Canal at that time.

The canal which Mr. Wright reported against,

contemplated a connection between the Erie Canal at Holley, Orleans County, and the Alleghany river, at Olean, 102 miles in length, with 1,331 feet of lockage, and the total cost of the whole work, with wooden locks, was estimated by the engineer who surveyed the line, at \$600,382 83. The canal from Olean to Rochester is eighteen or twenty miles longer, with a tunnel and a little less lockage.* There has already been expended in the construction of the Genesee Valley Canal \$3,976,200 22; and this does not include the sum of \$1,840,655 95 paid on account of interest on the sum borrowed for the construction of the canal, making a total of \$5,816,856 17. The canal is to be 118 miles long, of which 50 miles have been in navigable condition since 1840, and 36 miles more are to be ready in 1851, leaving 32 miles on which the work has not been commenced since the suspension in 1842.—Since 1840, there has been paid for repairs, &c., on the navigable portion of the canal, \$254,608 18, and received for tolls in nine years, \$177,640 96.

These results show that the credit of the state would have been subjected to hazard by commencing the work without making adequate provision for the money borrowed for its construction. Whatever might be claimed for its contributions to the Erie Canal, nothing could be derived from that source for many years, as the canal revenues were secured to another object by a constitutional pledge. The tax with which the Treasury had been aided from 1816 to 1852, and from which an aggregate sum of more than three millions of dollars had been realized, was discontinued the year before Mr. Wright made his report, notwithstanding its continuance was recommended by Governor Marcy, who was at that time Comptroller. Mr. Wright saw in this the settled determination of the Legislature not to aid the Treasury by a tax, when its resources were insufficient for the ordinary support of the government without it—the canal fund was tied up for at least ten years, and the school fund had been placed by the Constitution beyond the reach of the Legislature. In this state of things, the preservation of the credit of the state, and of a sound system of finance, made it necessary to resist the numerous applications for internal improvements made at that period. The firm stand taken by Mr. Wright in favor of maintaining the credit of the state in all its financial operations, was attributed to a feeling of opposition to internal improvements, although the committee stated their views in the report in the following explicit language:—

"That the observations made by the committee in the foregoing report, so far as they relate to the Erie and Champlain Canals, are intended merely as a financial view of the canalling policy of the state, for the purpose of enabling the Senate the better to determine how far that policy may safely be extended at the present time, they believe it is not necessary for them to declare. That any inference can be drawn from any of the positions taken in this report, going to show that the committee, or any member of it, is unfriendly to these stupendous works, they cannot for a moment admit. That they are fully sensible of the immense benefits derived to the population of the state from the construction of these canals, and as deeply conscious of the wisdom of the policy which dictated these expenditures, as any other citizens of this state, they believe to be true. That the benefits and facilities to be furnished to the community, and the substantial wealth to be added to the state by the increasing business and prosperity of its citizens, and not the profits to be derived to the Treasury, are the great considerations in such expenditures, they admit, also, to be correct in principle; subject always to the antecedent condition, that the treasury is able to sustain the expense, or that, if the public credit is to be pledged, the means of sustaining it without burdening the taxable inhabitants, are morally certain."

Mr. Wright demonstrated, in this report, that if

* James Geddes estimated the cost of the Genesee Valley Canal in 1826, 111 miles, at \$875,588, Wm. Jones had previously estimated it at \$633,031. In 1835, F. C. Mills estimated the cost, 122 miles, at \$1,890,614. In 1839, the same person made an estimate of \$4,289,269. The canal has 1,150 feet of lockage, and 114 locks.

all the money applied to the Erie and Champlain Canals had been borrowed, (as must be done in all cases of the lateral canals,) the debt for those canals at the close of 1836, would have been \$10,207,328, instead of \$7,672,782 24, the amount of the outstanding stock at that time. And it has since been demonstrated by actual results that, while the stock debt was provided for in ten years by the canal fund, the revenue from the tolls of the canals, unaided by auxiliary funds, would not have paid the debt in less than twenty years from the time the canals were completed.—*Merchants' Magazine*.

To be continued.

FINANCES OF OHIO.

We learn by the Governor's message that the total amount of the debt of the State on the first of January, 1851, will be as follows:

Foreign debt.....	\$16,566,773 69
Domestic bonds.....	493,824 00
School and trust funds, 1,683,996 63	
	\$18,744,594 32

The following is a summary statement of the receipts and expenditures of the fiscal year, ending on the 15th November, 1850:

RECEIPTS.

General Revenue received during the year 1850.....	\$275,901,02 0
Canal Tax, including \$175,000 00 sinking fund.....	988,433,29 0
Canal tolls and water rents.....	728,985,73 0
Balance in the Treasury on the 15th November, 1849.....	555,430,40 3
Miscellaneous.....	544,138,43 5
	3,091,993,80 0

EXPENDITURES.

Paid General Assembly, Judicial and State Officers, State Institutions, claims, and incidental items.....	\$391,186,48 1
Paid for repairs of Public Works.....	329,595,00 0
Repairs of National Road, etc.....	47,242,66 0
Interest on Domestic Bonds.....	28,694,66 0
Interest on Foreign Debt.....	1,022,358,95 0
Common School Fund Distributed.....	200,000,00 0
Interest on special School and Trust Funds.....	97,272,81 0
One per cent on surplus Revenue.....	8,530,36 1
Fund Commissioners on account of State Debt.....	657,886,34 3
Balance remaining in the Treasury on the 15th November, 1850.....	132,066,12 1
Miscellaneous.....	177,160,42 0
	\$3,091,993,80 0

Tennessee.

Iron for the Tennessee and Georgia Railroad.—The ship India, Capt. Willis, from Rill, England, arrived at this port yesterday, has on board 3608 iron consigned to Mr. P. Tefft, for the Georgia and Tennessee Railroad.—*Sav. Georgian*.

New York.

Ogdensburg Railroad.—The following are the earnings of the Northern (Ogdensburg) Railroad, for the month of November, 1850.

From Freight.....	\$22,526 08
Passengers.....	6,374 12
	\$28,900 17
Earnings in October.....	22,105 66
Total, for two months.....	\$51,006 95

Tehuantepec Railroad.

The following compose the principal part of the corps of Engineers who sailed in the steam ship Alabama, for New Orleans, for the purpose of aiding the line of railroad across the Tehuantepec Isthmus: Maj. J. G. Barnard, of the U. S. corps of Engineers, Chief Engineer; J. J. Williams, of New York, Principal Assistant; George F. Dunbar, of New Orleans, do.; Dr. Canter, of New Orleans, Physician; Passed Midshipman Temple, U. S. N. Hydrographic Assistant; Passed Midshipman Murphy, U. S. N. do. Mr. Mechlin, U. S. Coast

Survey, do.: Mr. de Lacey, of New Orleans, do.; Mr. H. P. Andrews, Clerk.

Georgia.

Milledgeville and Eatonton Rail Road.—We learn from the Savannah Republican that the arrangement for constructing the proposed railroad, from Eatonton to Milledgeville, may be regarded as completed. The road will cost about \$130,000 of which \$120,000 are subscribed. It is understood that a very small subscription (a few thousand dollars) on the part of the citizens of Savannah, will finish the business. This subscription we are assured there will be no difficulty in obtaining. The road when completed will throw some 20,000 bags of cotton into this market, not usually received here. The plank road from Sparta to Tennille will complete all the connections of the Central road which will be demanded for years to come.

Atlanta and West Point Railroad.—We had the pleasure, on Tuesday last, says the Atlanta Intelligencer, of passing over that portion of this road which is already finished. The track is now completed to within one mile of Fairburn, eighteen miles from Atlanta. The track has been laid with a substantial T rail, and the work is going a head with great rapidity. A considerable force is now employed in laying down the iron, to be continued on this department of the work until the entire road is in running order to West Point. The new engine "Lagrange" is at present running daily, conveying the iron and other materials from this city to supply the workmen as fast as they progress with the work of laying down the rails. The original charter for this road, it will be remembered, only extended from Atlanta to Lagrange, but during the last session of the Legislature it was so amended as to extend to West Point.

The contract for that portion of the road between Lagrange and West Point has been let on favorable terms, and the grading has already commenced in the vicinity of Lagrange. The force has been so disposed throughout the whole line that the work in all parts will be pushed forward with the greatest possible despatch. This road unites with the Macon and Western railroad, about six and a half miles from Atlanta, and we understand that arrangements have been made for substituting, on this portion of the Macon and Western road, a heavy T rail instead of the flat one now used. With no serious or unlooked for obstacles to impede the progress of the work, a year and three months will see the line of railroad from this city to Montgomery, Ala., in complete running order. From our observations of the portion thus far finished, we are convinced that the Atlanta and West Point railroad will be one of the most substantial and durable roads in the United States.

BRIDGE OVER THE OHIO AT LOUISVILLE.

A bill is now before Legislature of Kentucky for the incorporation of a company to bridge the Ohio at Louisville. The capital stock of the company is fixed at \$600,000. The bridge is to be 100 feet above low water, and not to have a span less than 100 feet. The company is to provide competent pilots, and to be liable for all injury sustained by vessels in passing the bridge that have such pilots aboard, and not to be liable for any damage sustained by boats that refuse the company's pilots. The tolls of the bridge are at no time to exceed 12 per cent. on its cost. If any slave is allowed to cross the bridge without a written passport from his owner, the company is to be held liable for the value of such slave, and ten per cent. in addition.

THE UNITED STATES MINT.

The *North American* gives the following statement relative to the operations of the Mint for the month of November:

Gold dust deposited during the month.....	\$4,400,000
Coinage during the same period.....	4,104,000
Aggregate receipts of California gold dust from Jan. 1 to Nov. 30, inclusive.....	27,350,000
From other sources.....	1,900,000

Total receipts—eleven months....\$28,550,000

Baltimore and Ohio Railroad.

The revenue of the Baltimore and Ohio railroad for November have been as follows:

	For Passengers.	For Freight.
Main Stem.....	\$25,802 36	\$84,544 87
Washington Branch.....	19,091 71	4,614 67
Total.....	\$44,894 17	\$89,159 54

Making an aggregate of \$110,347 33 on the Main Stem, and \$23,706 38 on the Washington Branch—the total being \$134,053 71.

IMPORTS OF THE UNITED STATES.

The Treasury Statistics will make the following exhibit of the last fiscal year:

Gold Bullion.....	\$9,257,240
" Specie.....	1,600,722
	\$10,857,962
Silver Bullion.....	\$26,316
" Specie.....	2,825,820
	2,852,136
Iron and Steel.....	23,100,607
(Of which amount \$8,141,901 was of Bar Iron)	
Woollens.....	15,966,784
Cottons.....	19,896,630
Silks.....	17,069,616
Silk and Worsted.....	1,653,809
Flax, Linens, &c.....	8,095,022
Teas, pounds, 28,752,847.....	4,588,373
Coffee, " 144,986,895.....	11,213,076
Spirits, (Brandy, Cordials, etc.).....	3,166,841
Sugar, [white \$846,939; loaf \$48,664; brown, \$6,659,543].....	7,555,145
Salt, bushels, 11,224,185.....	1,237,186
Guano, tons, 8940.....	91,984
Coal, " 180,439.....	378,817

Total amount of Imports, 1850....\$187,217,574
From this should be deducted the foreign Exports amounting to.....14,951,808

VIRGINIA MINERALS.—The *Richmond Enquirer* has seen a very rich and beautiful specimen of plumbago, turned by a plow on the land of John R. Edmonds, Esq., of Halifax County. "There is a mine of substance running half a mile through a hill, and which appears to be inexhaustible. It lies in lamina, very similar to coal deposits. The bed lies about half a mile from Bannister River, navigable for batteaux as far as Weldon, whence the plumbago may be transported to Norfolk and other markets. The specimen referred to is used to advantage in converting into steel and in the finest and most delicate castings of iron. A piece of the metal, with specimens of other Virginia minerals, is to sent to the World's Exhibition. The Barrondole plumbago mine, England is the only one in that country, is exceedingly valuable, and as scrupulously guarded as if it were gold.

The Coal Trade for 1850.

The quantity of Coal sent to market this week by Railroad is 47,313 02 tons—The whole quantity sent to market by this road for the year ending November 30, 1850, is 1,351,507 tons, against 1,097,761 19 tons for the previous year. Increase for 1850, 253,745,04 tons. The Coal was derived from the following places:

Port Carbon.....	468,554 10
Pottsville.....	175,815 13
Schuylkill Haven.....	535,535 17
Port Clinton.....	171,601 03

Total for the year, 1,351,507 03

The trade was interrupted some during the week at the Columbia bridge, and we also learn that the demand is slackening off a little at Richmond. We see no good reason for this, as the supply of coal in market is still about 150,000 tons short of the supply of last season without making allowance for increased consumption. It is hardly possible that stoppage of factories could effect the trade to so great an extent, when we know there has been an increased demand for the California trade and ocean steamers.

There is great rejoicing amongst those engaged as Collectors, Clerks, etc., connected with the different transporting companies and lateral roads, that the active coal season is about drawing to a close. They have nearly all been worked to death for the last two or three months—many of them remaining at their posts until two or three o'clock in the morning, and others in their offices night after night, until broad day-light.—*Miner's Journal.*

Receipts of Flour and Wheat.

Our weekly statement of the receipts of flour and wheat at tide water for the last eight days in November, or what is known in the canal department as the 4th week in November, and published yesterday, showed an aggregate receipt of flour and wheat greater than has ever before been received in any canal week during any previous season—overtopping the receipts for the 4th week in May, 1847, which, until the close of the 4th week of November, 1850, had furnished the largest receipts.—We give the receipts for the past two weeks:

	Flour, bbls.	Wheat, bush.	Equal to
1850, Nov...	301,500	490,215	399,543 bbls flour.
1847, May...	324,227	219,221	368,171 "

Excess.....31,372 "

Showing an excess in the receipts of the fourth week in November, 1850, (which embraced a period of only eight days,) over the receipts of the 4th week in May, 1847, (which embraced a period of nine days,) equal to 31,372 barrels of flour.

There is another point in these receipts, showing the capcity of the Erie Canal to pour in upon us an almost exhaustless flood of breadstuffs. We allude to the receipts of flour and wheat at tide water for the month of November, just passed, and compare them with the receipts for the month of June, 1847—the year of large receipts. Our readers can figure out for themselves what the quantity and price of flour at New York would have been, had the Erie Canal, without being taxed to its utmost capacity, emptied in upon us receipts of flour and wheat during the canal season, equal to what the following figures show it has done during the month just past:—

	Flour, bush.	Wheat, bush.	Equal to
1850, Nov.	921,410	1,315,907	1,184,591 bbls flour.
1847, June.	750,129	1,242,518	998,632 "

Excess.....185,959

Showing an excess of 185,959 barrels of flour.

Large as this amount is, we have no doubt it will be wanted before the re-opening of the navigation on the canal—the complexion of the advices from England by several of the recent steamers holding out prospects of a large demand from that country, not only upon the surplus of Europe, but upon our Atlantic stocks.

Those who seem to be so much alarmed at the construction of railways—tapping, as it would seem, the business of our canal—have but to look at the figures given above. We think it will be many a long year before any railway now constructed will, with such other freight as would naturally offer in the course of an entire twelve-month, transport from one terminus thereof to the

other as much flour as the Erie canal has delivered at tide water during the month of November.—*Albany Advertiser.*

The Railroad to San Francisco and Oregon.

H. V. Poor, Esq.,
Sir—The project for a railroad from the Atlantic States to the Pacific Sea, at San Francisco, will undoubtedly again be brought up at the present session of Congress, and a grant of public lands asked for in aid of it.

It is desirable that the numerous friends of the measure scattered over the country should give some consideration now to the best manner of carrying it out in practice. The general discussion thus far has impressed the country and Congress favorably towards this most important communica-

tion between the two seas, but both Congress and the people hesitate in regard to the modes which have been proposed to carry it into execution.

To satisfy the good sense of the country, as well as its pride, which is interested in the successful accomplishment of this bold project, should it be undertaken, the scheme must be clear in its plan, and fair and open in its operation. It must not be one-sided, or liable even to the suspicion of being created to enrich individuals, or to favor a merely speculative spirit.

There are three schemes prominently before the public, that of Senator Benton, that of Mr. P. P. F. Degrand of Boston, and that of Mr. Whitney.

Mr. Benton's scheme, if I rightly understand it, is founded on the application of the proceeds of all the public lands to the building of this road. But as there seems to be no disposition in Congress to favor it, and we must have a scheme which that body can unite upon as practicable, it is unnecessary to discuss his project now.

Mr. Whitney is looked upon as the father of the project, and as such many persons consider him entitled to a patent right to enrichment by it. This mode of looking at it, however, may be carried so far as to make Mr. Whitney appear first, and the project second; whereas, however meritorious Mr. Whitney's exertions may have been, or prophetic his perception, the railroad itself looms up as the great feat to be accomplished, and in its presence all subordinate agents must occupy a subdued position.

No man, from his peculiar relation to it, could have done more to bring it to a prompt and successful issue than Mr. Whitney, and it is by no means asserted that his private views may not be in accordance with a plain and business-like mode of carrying it out. But his scheme is not before the public in such a shape now as to command its entire confidence. It is not explained in such detail, in regard to the sale of the lands, the mode of application of the proceeds, the distribution of the stock and the construction of the road, as to enable men familiar with railroads to understand its entire operation. While, therefore, legislators have gone in favor of it, conveying thereby rather their approbation of the proposed road and the zeal of its author, than of this particular mode of accomplishing it, business men and railroad men have generally gone against it. To place such a scheme in the hands of one man is itself a dangerous and unnecessary experiment. It may be so modified as to take a more business like shape, and if Mr. Whitney's scheme is to pass during the present session, it is to be hoped that it will be made more explicit than as now presented.

Mr. Degrand has been so long practically conversant with railroads, as to entitle any suggestions from him on this subject to respect. The mode proposed by him would effect the end more easily and economically than any other method, because no inducement would be needed to procure the necessary capital, the United States guarantee being sufficient to command it. All other schemes must offer inducements commensurate with the supposed risk attending the investment, the absence of that local interest which secures to short railroads a large part of their capital, and the necessity of a speedy realization of the value of any lands at our disposal. All other schemes must therefore cost more in the first instance than this simplest scheme, in the ratio of the success which the inducement, or premium offered, or forced sale, is worth.

But Mr. Degrand's scheme is impracticable, because Congress could not be made to entertain it, and the feeling in Congress and out of doors is in favor rather of paying a bonus to a private company to effect the desired connection, than for the government to undertake it in a more direct way.

I propose to lay before you the heads of a scheme founded on the application of a certain amount of the public lands to the creation of capital for the construction of the road, and although it differs essentially from Senator Benton's scheme, and from Mr. Degrand's scheme, I hope that it will receive a fair consideration. It is offered only as a nucleus for discussion, and only because neither Mr. Benton's nor Mr. Degrand's schemes will be sustained, and Mr. Whitney's scheme leaves the public too much in the dark. The objects desirable at this moment are, to find a practicable scheme which shall unite the friends of the road, and to present the basis of a company which shall have the confidence of the public. If Mr. Degrand will take the matter in hand now, and in connection with the men of most experience in railroads in our most important cities, will prepare a measure to suit the circumstances, he will find a disposition existing in Congress to view it favorably; or if Mr. Whitney will take the same course, he might obtain what he has not now, the confidence and support of the railroad interests. Mr. Degrand, however, and the men with whom he has been associated, are more familiar with such matters than Mr. Whitney, and would be more likely from their long experience to give the design a working shape. Mr. Whitney might well be content to act with them, if the honor of being father to such a project should not be sufficient satisfaction to him.

The scheme which I propose to explain is founded on an issue of shares of one hundred dollars each, to the extent of capital sufficient for the perfect construction of a single track, and it offers as a bonus or premium to all subscribers to such stock an amount of land equivalent to the value of the stock, estimating the land at the prices explained in the table annexed. The subscriber for each share of \$100, owns \$100 in stock and \$100 in land.

This bonus of land is not given because the stock is considered of doubtful value, but because the amount of money necessary to the rapid execution of the work, cannot be obtained promptly otherwise. I will not embarrass the subject now by discussing the business prospects of the road and its value as a safe investment.

SCHEME.

Distance from the western line of Missouri near Kansas, to San Francisco, 2000 miles.

Let there be appropriated a strip of land 28 miles wide on either side of the road, 25 miles of this being considered available in the calculation, and the remaining three miles worthless, or unavailable.—Let it be provided that should the road pass thro' some barren tracts of country, where the land may be of comparatively little value, the company shall receive other valuable lands in lieu of such tracts, that its good credit, on which rests the success of the enterprise, may always be maintained.

Let certificates be issued of the value each of \$100, or multiples of \$100, to the extent of \$1000, and let each holder of such certificate, besides owning an amount of land equal to \$100, be a stockholder to the same amount. Make the certificates transferable from hand to hand.

Let the land be estimated after a scheme which shall proportion the price to its proximity to the

however, may be simple, though for the different prices, the sections of land due to one hundred dollars will necessarily be different. Each one hundred dollar certificate would represent the following quantities of land, according to the class chosen by the holder:—

Value of land per acre. Dollars.	Acres to each certificate of \$100.	No. of sections in each square mile.
5	20	32
4	24 6-10	25
3	32	20
2 50	40	16
2	49 1-4	13
1 50	66	10
1 25	80	8
1	100	6
0 75	133	5

I have not estimated for a double track though that will be wanted shortly after the completion of the road; for the reason that business which will render a double track necessary, will command the capital to construct it. A single track properly arranged, will accommodate an amount of business sufficient to make a good return on the investment, nor need the building a second track and the additional capital required then, reduce the profits of the original stockholders, for the second track will only be rendered necessary by an increased amount of transit on the first. My object has been to simplify as much as possible the industrial problem before us, and to complicate it with no provisions which are not absolutely necessary to its solution. The price per mile affixed to the estimates of the different diversions, is predicated on the character of the Missouri country as a type of what will occur on the plains and throughout the route, except at the mountain passes. It would be as unwise to affix an unreasonably high scheme as one too low. The broken and difficult character of the New England country, so far as we can judge here, gives an average cost inapplicable to the country through which this road will pass.

The scheme suggested here and modes proposed want to be discussed and sifted. The proposed road is not a wild vision of a speculative age and country as many imagine. The scheme when approached will be found to have roots which are being constantly nourished.

When some practicable mode of operation is settled upon, the next step will be to form the nucleus of a company and to prepare a memorial, ask for a fair hearing in Congress and for the passage of a bill in accordance with the case.

The subscription of one million of dollars and the payment into the hands of a responsible man of 10 per cent should constitute the company and entitle it to the action of any bill founded on these general principles.

The construction of the proposed road as it is located should be confided to responsible contractors who would undertake at least 100 miles of the road in one division, including the engineering, subject to specific plans, grades and curvatures, and whose progress would be superintended by competent engineers appointed by the company.

The road should start from St. Louis because St. Louis is the most prominent city of the extreme west, where shortly railroads from all sections of the country will converge. The length of road to be constructed is besides in this case reduced. The citizens of the State of Missouri will build their road to the western line of the State, 300 miles,

leaving about 2,000 miles to be built by the overland company.

But if it is judged otherwise, and a bill should have favor commencing the road elsewhere, as proposed by Mr. Whitney, the citizens of Missouri will claim the privilege of making a branch into the main trunk and will ask for the same description of grant to that end, and the same privileges as the main trunk line, and will clearly show in proof of the propriety of such equal privileges being awarded them, that a larger circle of population will be accommodated than by the extreme northern route, a greater number of States and a much larger scope of industrial interests embracing essentially all those affected by the northern line. The Missouri line will approach the heart of the western valley and will come into closer proximity with the Southern States, while the northern route skirts the far west edges of the settlements covering a greater extent of lands presently available, at the expense of the general accommodation. The road which I have in view would immediately enter the unsettled Indian country, and would commence a long way in advance of the Lake Michigan route.

I will not pursue the subject further now. If a company could be formed I know of no men more fitted by their long familiarity with railroad operations to take the lead in it than Mr. Degrand, Mr. Hale, Mr. Derby and many others in Boston and other seaboard cities who have proved themselves working men in all railroad affairs.

For the sake of simplicity I have confined my calculations and remarks to the direct line to San Francisco, but the branch to Oregon would be embraced in the same general scheme and the same principles would be applicable to it.

There are many other points which have been avoided for the present for a similar reason.

Your obt. serv't.,

A. SUBSCRIBER.

St. Louis, Mo., Dec. 1, 1850.

Indiana.

Richmond, Hagerstown, New Castle and Pendleton Railroad.—The board of directors of the New Castle and Richmond railroad, at their meeting on the 2d inst., completing their organization by electing Hon. J. T. Elliot, President; T. B. Woodward, Secretary; and Eli Murphey, Treasurer.—Mr. Erwin, of Hamilton, will probably be continued as principal engineer. The character of the board and officers are a sufficient guarantee wherever they are known, that the work will be pushed forward as rapidly as possible, and that the affairs of the company will be prudently managed. Mr. Erwin is now preparing the whole line for letting, and will have his report ready for the action of the board at their meeting on Monday week.—*New Castle Courier.*

Michigan.

Michigan Southern Railroad.—The earnings of Michigan Southern Railroad for November were \$20,265. For the last four months the earnings compared with the same months in 1849 as follows:

	1849.	1850.
August.....	\$10,379 03	\$16,417 29
September.....	14,082 65	20,483 81
October.....	15,373 47	29,096 73
November.....	9,822 47	20,265 00
Total.....	\$49,657 62	\$85,262 83
		49,657 62

Increase equal to over 73 per cent.... \$36,605 21
In the six months ending 30th November the

total earnings of the road were \$102,979.99, while the expenses for operating, repairs, including taxes and rent, payable to the Erie and Kaalamazoo Road for the same period, were considerably under 50 per cent of the gross earnings. This enables the Company to pay a dividend of \$4 per share for the current six months, beside reserving a very handsome surplus for the use of the Road.

Ohio and Pennsylvania Railroad.

The bids for the \$500,000 mortgage bonds of this company were opened at the house of Winslow, Lanier & Co. on the 7th inst.

The following were the successful bids:

H. K. Craig.....	2,000	96
Meyer & Stucken.....	10,000	91 99
Poland, Jenkins, & Co.....	5,000	92
Adam Pierson.....	1,000	92
J. N. Perkins.....	5,000	92
J. N. Perkins.....	5,000	91 86
Jno. Ferguson.....	10,000	92
Jno. Ferguson.....	10,000	91 25
R. P. Van Zandt.....	5,000	91 85
Jno. Thompson.....	10,000	91 85
Jno. Thompson.....	10,000	91 65
Jno. Thompson.....	10,000	91 45
Jno. Thompson.....	10,000	91 36
C. S. Francis.....	10,000	91 65
J. N. Perkins.....	5,000	91 56
J. N. Perkins.....	5,000	91 50
J. N. Perkins.....	5,000	91 26
A. Colville.....	5,000	91 45
P. McMartin.....	5,000	91 26
DeLannay, Iselin & Clarke.....	40,000	91 26
DeLannay, Iselin & Clarke.....	60,000	91 22
Samuel Riggs.....	43,000	91 25
E. C. McIntosh.....	38,000	91 23
Morant Iselin.....	50,000	91 23
P. McMartin.....	15,000	91 20
J. F. Sanford.....	50,000	91 20
C. C. Alger.....	34,000	91 20
Ward & Co.....	25,000	91 16
E. S. Whelen & Co.....	7,000	91 15

Total.....\$500,000

Of the \$500,000 there were \$434,000 taken at 91 20 and 91 85 inclusive. In addition to the above there were bids for \$744,000.

The above may be considered as a very advantageous sale for the company, and has undoubtedly produced more than a private sale could have effected. It will have a very beneficial influence upon western credits, as it gives a standard by which similar securities will be measured. This is what they have wanted for a long time. Their value thus far has depended more upon accidental circumstances than upon the intrinsic worth or the condition of the money market. There is now a constant and regular upward tendency in these securities, and there is no reason why, in a very short time, they should not command as high a price as those issued by eastern companies.

One thing we will say, that New York has acted the handsome part in this matter. The above road was projected and is being built for the express purpose of giving to Pennsylvania and to Philadelphia the trade of a section of country now enjoyed by this city. Philadelphia claims that this road is going to give her the western trade, and that in respect to this, when the above road is completed, she is going to change places with New York. With this object in view, she comes into this city for the necessary means, and this project receives the universal commendation of our press, which has done all it could to secure this project the most favorable reception. There has not been a suggestion from any quarter that the above was a rival of our great lines of railroad, the success of which our people have so much at heart, and that it might take away a very large portion of our

trade. All this certainly proves that we are either very indifferent to our interests, or that we are very tolerant and liberal people. To some extent both of these conclusions are correct. Some of the above bids too were probably on foreign account, and capital from this source pays no attention to State boundaries. If other lines having a more intimate connection with this city are disposed to complain, they must make out as good a case as the above road has done, and they will fare equally well.

AMERICAN RAILROAD JOURNAL.

Saturday, December 14, 1850.

Tubes. Tubes. Tubes.

THE Undersigned have received special permission from, and are in direct communication with, THE BIRMINGHAM LAP WELDED IRON TUBE COMPANY, for the sale of their very excellent and superior Boiler and Gas Tubes in large or small quantities. These Tubes are used very extensively both in England and the continent of Europe, and sold exclusively by

WILLIAM BIRD & CO.,
Iron and Tin Plate Merchants,
44 Wall st., New York.
5 Martin's Lane, City, London.
and 140 Buchanan st., Glasgow.

December 13, 1850.

Qualifications for the Management of Railroads.

There have now been expended upon the railroads in the United States at least \$300,000,000. This expenditure has been chiefly confined to the last 15 years, and by far the greater part since 1840. We are now expending some 20 to \$30,000,000 annually upon these works, with every prospect that the amount will yearly increase.

The growth of the railway interest as a distinct department of industry is without parallel in the history of industrial pursuits. It has given to capital an importance never felt by it before. So rapid has been this progress, and so vast their demand upon the labor and capital of the country, as to allow but little time or attention to the economics of construction and management; the attention of all connected with them being constantly occupied in getting them in readiness for operation. The short time that has elapsed since their introduction has not been sufficient for experience to mature itself, even with those who enjoy the best opportunities for observation; and a large proportion of our engineers have no such opportunities, hurried as they are from one work to another. The demands of new works increase much faster than they can be met by engineers of experience. Their superintendence must, therefore, be entrusted to those who qualify themselves for their duties as they go along. We meet with the same difficulties to a still greater extent in the management of railroads, as a fitness for this position requires more skill and experience, a better education, and a higher capacity, than the ordinary work of construction. A man without science, or much education, may dig down a hill or fill up a ravine as cheaply as the most scientific, ordinary experience being all that is wanted in such a case as this. But in the running of an engine, the laying of a rail, or in the general superintendence of a track, ordinary experience furnishes no sure guide. Capacity here must be the result of experience in this particular thing; and as this task is vastly more complicated than the former, there are proportionally fewer than are fitted for success in it.

Now the amount of loss which is directly attri-

butable to unfitness and inexperience on the part of those engaged in railroad construction and management, bears a very large proportion to the whole expense. Many persons who have enjoyed the best opportunities of estimating this loss place it as high as 25 or 30 per cent of the whole cost. If such is the fact, we are paying a frightful penalty for our ignorance and incapacity. But whether this loss is 10 or 33 per cent, the amount attributable to this cause is enormous, and is admitted by every company, as well as most every person employed, as one of the great drawbacks upon the profitability of railroads, and as the great evil that needs reform.

It may be well to call attention here to the fact, that while the cost of many of the items of construction have been reduced from 50 to 100 per cent., the result of our increased experience, the cost of running roads regularly increases. This, though a very striking fact, is easily explained. The work of construction is generally committed to private enterprise, which is constantly stimulated to the devising of means, by which the cost of the work may be cheapened. Every experiment that promises an improvement upon the old mode is resorted to, and every improvement is instantly brought into use. Every expense is curtailed to the utmost limit. Every economy is put in practice; and our mode of working to-day is the result of all that we have gained from past experience. Those employed here are urged forward by the double stimulus of self interest as well as of an inventive disposition. But when we come to the running of railroads everything is reversed. Here those employed have a regular salary, irrespective in a great measure of qualifications or amount of service performed. Their pay is fixed, and as they have no direct interest in the result of their labors, they have but little motive to economy or inducement to the exercise of the inventive facilities to reduce the expense, or increase the efficiency of the force employed. To men so selected, the *past* will be the standard of excellence. The *past* has given them their places, and if the future equals the past their obligations are discharged. We do not mean to assert the above as of universal application, only to state the natural result of the relation sustained by the employees on a railroad to the company. In every situation in life we find persons with whom money is regarded as the least valuable reward of labor, who dedicate themselves to their appropriate calling, and find all the reward they desire in the consciousness of having well done, whatever they have undertaken.

Now if companies continue to operate their roads on their own account, the great work of reform should begin by qualifying those employed, for their respective duties. But we labor under great disadvantages here, in the difficulty that exists of diffusing, and of making common stock the results of individual experience. We have roads that are well managed, and by persons who are capable of instructing others, and if the aggregate of experience or capacity which exists, could be made available by all, we should have but little to complain of. But there is among our engineers a great unwillingness to come before the public with any of the results of their own observation. One great reason of this unwillingness is to be found in their early education. A majority, perhaps, of our best engineers never acquired a facility of expressing their ideas in writing, nor enjoyed the training of an university when young. Now ease in writing can only come from habit, and a confidence in our

ability to make use of proper terms and a correct style. An engineer, therefore, of undoubted capacity, and who can express his ideas with the utmost clearness in conversation, finds it quite a different matter when he sets himself down to write for the public press. The want of experience makes this so irksome a task that it is frequently neglected altogether, or if he can overcome this, he distrusts his style and mode of expression. So strong is this disinclination to write from these causes that it is a very rare thing to see an engineer in print, either under his own name or anonymously. In the intercommunication of ideas and experience, our engineers labor under a great disadvantage in the vast extent of our country. This allows only of limited intercourse. We need, too, some common point, where all the results of railroad experience can be collected. In England all charters proceed from the same authority. With us, each State has its own system. Returns of railroad companies, if made at all, are made to the State governments. These are not only very imperfect, but they must be sought for in every State in the Union, and it is a very difficult matter to collect and present them in one body. There is too, a certain amount of State pride which has an effect to isolate the engineers of one State or section upon those of another. All these are so many additional hindrances to the free transmission of ideas, so essential to general improvement.

In New England, where all these difficulties are not felt to so great an extent, the superintendents of railroads have formed an association for mutual improvement, which meets monthly to discuss the various questions that arise in the discharge of their duties. This association is doubtless productive of great good to its members, but its usefulness is confined to them, as but few of the results of the deliberations are made public. We apprehend, however, that this association is much less useful, even to its members, than it might be made to be. To enable it to effect all that it is capable of accomplishing, such an association should be possessed of sufficient means to dispose of all questions that may arise in their appropriate manner. To do this may involve a very considerable expense in instituting the proper experiments or tests. It should possess abundant means for such experiments, to compensate those making them, and defray the expense of making them public. Such means, we presume, the New England association does not possess. Their conclusions must, therefore, be the result of conjecture, rather than demonstration. In this respect the English are greatly in advance of us. Their scientific organizations possess abundant means for carrying out the objects of their formation. With them no sooner does a fact arise, than they set to work to discover the theory, the *rationale* of it. They do not allow themselves to grope in the dark, or to remain subject to a blind caprice. With them fact and theory go hand in hand. The consequence is that every successive step is the natural sequence of the preceeding.— They leave no room for accidents. They will not hazard success by adopting what is *plausible*, so long as they can subject this plausibility to a test. They will use nothing that is not properly vouched. This is the secret of their steady and uniform success, not brilliant, but enduring. Now, as a nation, we are a much more inventive and skilful people. Our institutions, if nothing else, would render us so; and with the same means of progress, we should leave that nation behind in all the great industrial enterprises.

If in what we have said, we have described an existing state of things, the question arises how shall the correctives be applied. These must come from the action of the companies themselves. They must take some steps by which the experience and capacity of the few shall become the common stock of all, by which a skilful and experienced superintendent or engineer, or a well managed road, shall become an example for such as lack the proper qualifications. In this matter we should not look to the State, or general governments for aid. It would be bad policy for them to interfere, and if they should, they could do but little to secure the desired result. The proper course is for all the railroads of the country to form a general association for the mutual improvement of all persons in their employ. This association should have regular meetings, at some central point, at which the various subjects connected with railroad management shall be fully discussed, and addresses given by persons properly qualified to instruct. The transactions of these meetings should be regularly published for the benefit of those who might not be able to attend. To secure the funds necessary to carry out fully the object of this convention, each railroad should be made to contribute in proportion to its capital, which would be but a trifle to each company.

We believe we have indicated the only mode by which the evils to which we have alluded can be corrected. In adopting these suggestions, railroads would simply follow the almost universal precedents of other interests; sanctioned by common sense, as well as the test of experience. The reason why they have not been before followed is the recent date of railroads. But if such associations are important to minor interests, how much more important would they become to railroads, an interest paramount to all others.

We have thus stated the necessity, and indicated the steps essential to reform. The details we shall develop at another time.

Notice to Contractors.

COVINGTON AND LEXINGTON RAILROAD.—Sealed Proposals will be received at the office of the Covington and Lexington Railroad Company, in this city, until the seventh day of January next, for grading eighteen (18) miles of the Covington railroad, commencing at the proper end of section No. twenty, (20) near E. Clarkson's house, and extending up the valley of the Licking river, and along the left or Western bank to the town of Falmouth, in Pendleton county. The proposals will include all the excavations and embankments, and the masonry for culverts; also the masonry for bridges.

Plans and specifications of the work to be done and the terms of payment may be seen at the office of the Company, at any time between the twenty-seventh of December and the seventh of January.

SYLVESTER WELCH,

Engineer Covington and Lexington Railroad.
Office of the Covington and Lexington Railroad,
Covington Ky., Nov. 25th, 1850.

Notice to Contractors.

ENGINEER'S OFFICE E. T. AND VA. R. R. CO., }
Jonesborough, Nov. 30th, 1850.

SEALED PROPOSALS for the graduation and masonry of forty miles of the East Tennessee and Virginia Railroad will be received at the Office of the Chief Engineer, Greenville, Greene County, E. Tenn., until the 15th day of January next.

A fine opportunity here presents itself to good contractors. Labor and supplies abundant and cheap, the country remarkably healthy, and every opportunity for the successful prosecution of the work.

This link of forty miles commences at McBee's

Ferry, on Holston River, 15 miles east of Knoxville, and extends to Bull's Gap.

A fine variety of work will be offered, and experienced contractors would do well to give it their attention.

Specifications, maps, profiles, &c., &c., will be in readiness for the inspection of contractors by the 25th of December.

By order of the Board,
LLOYD TILGHMAN,
Chief Engineer.

Panama Railroad.

We learn that J. C. Trautwine, Esq., has resigned the post of engineer of this company at Panama, on account of illness; his health having given way to the pestiferous climate of the Isthmus.

How far all the efforts of the company must succumb to the same cause remains to be seen. But there seems to be great reason to fear that they in the end must yield to the same influence. The little progress made the past year, shows the great difficulty of executing works in that climate, and how little these difficulties were appreciated in the outset. The fact alone, that in the United States a certain amount of work can be predicated upon a given sum of money, led people to suppose that it would accomplish the same result at Panama; forgetting that the two cases were entirely different; that at Panama the amount required to meet the demand of the climate alone, would be ample for the completion of a work in this country, similar to the one attempted there. It is impossible to conjecture what proportion of means will be absorbed by a climate which is so fatal to all unacclimated persons, and which renders the natives almost incapable of prolonged physical exertion. So formidable are these obstacles, that works of trifling magnitude elsewhere, may become impossible of execution here by private enterprise, which must be limited as to means, and which cannot command men except by money. We all know how a handful of blacks in St. Domingo, who, at the outset only inspired contempt, baffled all the efforts of France in the zenith of its greatness: and how a few Indians in Florida resisted for years all our efforts to subdue them. In both of these cases a nation's strength was put forth, and the causes that baffled all efforts were not the resistance of enemies, but the more powerful resistance of a pestiferous climate. To this we may attribute the want of success of this company, should their efforts prove a failure. Its means are vast, and will be likely to be expended without stint, and all arrangements for this work are on a most liberal scale.

But in the present case this company have great difficulties to encounter in addition to those we have enumerated. We all know how expensive and difficult all works become where the scene of operations is far removed from their base, where the direction and execution of affairs are widely separated. If we are rightly informed, this company propose to execute this work not in the ordinary and most approved way, by contract, [throwing the whole burden and responsibility upon contractors after the terms are agreed upon], but on their own account, they virtually becoming contractors. The advantages of the former mode of carrying on public works, is, that competition brings down the price to the lowest limit, and in the next place, a company summons to its aid a body of experienced and energetic men, who have as direct an interest as the company itself, in the economical and rapid progress of the work. These men stand between the company and the laborer, and see that every cent is properly expended, for upon an economical

expenditure depends all their profits. All are thus made coadjutors to the same end; and all have a similar interest in success. The following of this course, sanctioned by experience as well as plain common sense, would to a certain extent have transferred the directorship from New York to Panama, where upon the spot it could meet the exigencies as they rise, could preserve order, and keep up the discipline and courage of the men, in fine, could meet all the emergencies in the face as they might develop themselves, instead of waiting for instructions from a distant source. We are afraid that the company have not counted the cost of abandoning a fixed rule of similar companies, vastly more important to be followed in this than in ordinary cases, from the almost impossibility of personal superintendence on the part of the directors. They cannot expect to be served with any more zeal than other companies; and when men receive a fixed salary for their term of service, all experience shows that their principal object of anxiety will be; to see how little labor they can perform for their pay. There are many exceptions undoubtedly to this rule among the agents of this company; but on the whole it will be much more certain to be pretty closely followed at Panama than in this country, from the pain which attends all physical effort there.

This company we presume have been very anxious to complete their road at an early day, before the rival projects at Tehuantepec and Nicaragua should come in competition with their more direct routes. These have such a striking advantage over the Panama route, in point of distance, that we do not see how they could fail to become the great points of transit when completed, leaving Panama deserted, as far as the California and Oregon travel is concerned. There is now an equal chance that the Nicaragua will be completed, as the Panama. The former we believe to be a much healthier route. It will vastly reduce the distance over that by Panama, and diminish the time necessary to make the voyage to California in still greater ratio. We shall in a very short time have a direct line of railroad to New Orleans. From New Orleans, the voyage across the gulf could be made in a time not much exceeding two days.—One day more would suffice to cross by railroad to the Pacific. To New Orleans the distance from this city will be performed easily in three days. Allowing three more for the distance from New Orleans to the mouth of Coatzacoalcas, and one for crossing the Isthmus at this place, it would take only one week's time to go from New York to the Pacific coast. To reach this point by the Panama route would require at least three weeks, by a far more dangerous route, and almost the whole of it by sea. If both of these routes are completed, there can be no rivalry between the two; certainly not for travel going north, nor, in our opinion, for that going south. The Tehuantepec route would be much the quickest, even for those wishing to go to the west coast of South America.

The above are grave objections against prosecuting the Panama route, even if all the difficulties to be encountered were removed. But these must remain so long as the climate is unchanged. This route is proverbially unhealthy, and the vast sacrifice of life there, shows that its reputation in this respect is well founded. Most of those going out in the service of this company have little idea of what they will be called upon to endure. Those who may survive, we may soon expect to see re-

turn, and the reputation which their experience will give the country will render it very difficult to supply their places. We wish this company every success, as their object is a most laudable one; but we confess we cannot see much to encourage them in the prospect.

To Contractors.

SIXTEEN MILES of the Grading and a portion of the Masonry of the South Side Railroad, extending to a point opposite Farmville, will be let on the 17th of December next. The work is to be finished by the 1st of January, 1852.

Profiles, Plans and Specifications, will be ready for inspection at Petersburg by the 10th of December.

C. O. SANFORD,
Chief Engineer.

South Side Railroad Office,
20th December, 1850. } 3147

To Contractors.

SCIOTO AND HOCKING VALLEY RAILROAD. Sealed Proposals will be received at the Railroad Office in Portsmouth, Ohio, until the first day of January, A. D. 1851, for the Grading, Masonry and Bridging of 25 miles of the above road—20 miles extending from Portsmouth to the 20th mile Post, two miles east of Bloomfield, Scioto county, and five miles extending from Jackson, Jackson county, southerly to station number 2046.

The character of the work is such as is usually found in the State, consisting of about 30 sections of Grading, varying from five to eighty thousand cubic yards.

Plans and specifications will be ready for examination after the 15th day of December next, and the line ready for inspection after about the 20th of December.

Contractors proposing for the Bridging may bid according to plans furnished by the Engineer, or according to plans furnished by themselves.

By order of the Board of directors.

J. V. ROBINSON, President.

J. W. WEBB, Chief Engineer.

Scioto and Hocking Valley R. R. Office,
Portsmouth, Nov. 19, 1850. }

Rochester Scale Works. ESTABLISHED IN 1841.

THE Subscribers are manufacturing and prepared to furnish upon order all kinds of Scales, such as Canal Weigh Lock Scales, from 100 to 400 tons capacity.

Railroad Track and Depot Scales,
Cattle, Coal, and Hay Scales,
Dormant and Wheat or Hopper Scales,
Portable Platform, and Counter Scales,
Sugar Crushers, Letter Presses,
Warehouse Trucks, Wheat Cars, etc., etc.

Our long experience in the business, and the facilities we have for manufacturing, enables us to supply all orders promptly. Every article made of the best material and warranted.

REFERENCES:

J. W. Brooks, Supt. Michigan Central R.R., Mich.
Benj. Loder, Prest. N. Y. & Erie R. R., New York.
Charles Minor, Supt. do. do. do.
The Hon. Board of Canal Commissioners and Engineers of Erie Canal Enlargement.
E. F. Osborn, Supt. Mad River & Lake Erie R.R., O.
Sam'l Brown, Chief Clerk Freight Department New York & Erie R.R., New York.
John Wilkinson, Prest. Utica & Syracuse R.R., N.Y.
John B. Turner, Supt. Galena & Chicago R.R., Ill.
M. Sloat, Supt. N. Y. & Harlem R.R., N.Y.
Carlos Dutton, Supt. Roch. & Syracuse R.R., N.Y.
Henry Martin, Prest. Buffalo & Attica R.R., N.Y.
John Crockford, Agent Patterson & Hudson River R.R., New Jersey.
D. C. McCallum, Supt. Bridges & Buildings N. Y. & Erie R.R., N.Y.
B. Higgins, formerly Supt. Mansfield & Sandusky City R.R., Ohio.
A. H. Barber, Agent Mansfield and Sandusky City R.R., Ohio.
Charles Butler, Prest. Board of Trustees Wabash & Erie Canal, Indiana.
Jesse L. Williams, Chief Engineer Wabash & Erie Canal, Indiana.

DURYEE, FORSYTH & CO.,
No. 15 Water St., Rochester, N. Y.

General Depot and Scale Warehouse,
No. 205 Pearl St., New York.

India-rubber Goods for Rail Road Purposes.

THE Goodyear Metallic India rubber Co., (F. M. Ray, Agent) No. 104 Broadway, New York, (1 door from Pine street) has on hand and offers for sale at the lowest prices, an extensive assortment of Rubber Goods suitable for Railroad Companies, such as Hose of all sizes, Fire Buckets, Water Pails, Steam Packing, Car Covers, Tarpaulins, Clothing of all kinds for brakemen, switchmen, etc. Belting, and many other articles—all manufactured from Goodyear's Metallic India-rubber, and warranted to give satisfaction.

India-rubber HOSE is in use upon many railroads, for Tanks and Water Stations. It requires no oiling, is unaffected by heat or cold, and is in every respect a most desirable article, and much superior to leather. All sizes, from 1 in. to 6 in., or larger if needed, made to order.

The reputation of India-rubber for steam packing is well established, and it is now almost universally preferred to any other kind of packing. It will stand a higher degree of heat and last longer than any other substance. An assortment of every thickness from 1-32d in. to 1 1/2 in. always on hand.

Every article sold by the Goodyear Metallic India-rubber Co. is warranted, and will be offered to railroad companies at the lowest factory prices.

The Goodyear Metallic India-rubber Co. is a connection of the New England Car Co., and in addition to its large stock of goods for railroad and other purposes, has on hand a large assortment of F. M. Ray's Patent India-rubber Car Springs, both bearing and buffer, of all sizes.

Great Work on Bridge Building, etc., etc.

JUST published in medium folio, One Dollar, 75 cts. to subscribers.

Part III of a "THEORETICAL AND PRACTICAL TREATISE ON THE CONSTRUCTION OF BRIDGES IN STONE, IRON AND WOOD," including the Equilibrium of Arches, the mathematical principles of the Oblique Arch, Suspension Arch, etc., Construction of Foundations in Water, Centering, Oblique Arches, etc., the application of Iron to Railroad Structures, Practical Tunnelling, Suspension Bridges, etc.; illustrated by numerous accurately executed Plans, Elevations, Sections and Details of Stone, Iron and Wood Bridges, Viaducts, Tunnels, Culverts, Machines, etc., constructed by the most eminent Architects and Engineers in Europe and the United States, and numerous Original Designs for Bridges, Viaducts, Culverts, etc. The whole calculated to meet the exigencies of Engineers, and assist Draughtsmen, Bridge Builders, Mechanics and Students. By George Duggan, Architect and Civil Engineer.

The present part contains beautifully executed plans, elevations, sections, and details of the Cast Iron Girder Bridge on the South Eastern R.R., and the Timber Viaduct with Stone Piers and Abutments and laminating pine Arches 120 feet span on the Newcastle and Northfields R.R., accompanied by Articles on the construction of foundations, including Piling, Cofferdams, Concrete, etc.

Published by George Duggan, 300 Broadway, New York, to whom all communications should be addressed and subscriptions forwarded.

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NOTICE

For Proposals for Railroad Iron, for the Alabama and Tennessee River Railroad,

TO BE MANUFACTURED FROM ALABAMA ORE.

THE Alabama and Tennessee River Railroad Co. invite proposals, until the 1st of January, 1851, for Iron Rails, to be made of Alabama Iron, for the Northern Division and part of the Southern Division of their road, embracing a distance of about 105 miles. The rails are to be of the H pattern, in lengths of 18 feet, and weighing 63 lbs. per lineal yard. They are to be delivered on the Coosa river, at a landing to be hereafter designated, between Kimulgee ferry and Fort Williams, commencing their delivery on the 1st of November, 1851, and continuing it at the rate of from 80 to 100 tons per week, until the whole quantity required (10,500 tons) shall have been delivered. They are to be inspected by Lewis Troost, Chief Engineer.

It is proper to state to iron masters and capitalists at a distance, that the country traversed by the Northern and part of the Southern divisions of the road abounds in excellent iron ore and bituminous coal, and possesses every advantage for the successful manufacture of iron, health, cheap labor and provisions.

Further information may be obtained by addressing the President of the Company at Selma, Ala.

By order of the Board of Directors.

J. W. LAPSLEY, President.

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THE Patentee is now prepared to sell single or territorial rights to the use of the above named improvement. Recent experiments have demonstrated that this form of Boiler effects a saving of one half the fuel required to run the best Cylinder Boiler with return flues, and about 40 per cent. of the amount used by Locomotive Boilers. The heat is so thoroughly applied to the water that the temperature in the chimney is reduced below 140 deg. The smoke and combustible gases are consumed within the furnace. The refuse gas instantly extinguishes flame or sparks, so that all danger from sparks is avoided. This Boiler is very compact in form, occupying less space than any other of like power.

References—Thomas H. Faron, Chief Engineer U. S. Mail Steamer Arctic, N. Y.; Messrs Mott & Ayres, and Mr. D. F. Jaycox, Chelsea Iron Works, 26th street N. Y.; Messrs. Tugnot, Dally & Co., Franklin Forge, 1st avenue, N. Y.; Mr. John Mills, Machinist, 319 5th street, N. Y.; Mr. W. C. Smith, St. Albans, Vermont; and Messrs. Goulding,

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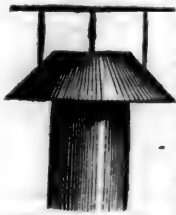
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This Ventilator is stationary, and cannot get out of order. It is constructed in such conformity to certain ascertained laws of pneumatics, as to insure a constant draft outward, whatever may be the changing direction of the wind. The Massachusetts Mechanic Association have awarded a gold medal to the Inventor, and the Manufacturers have already disposed of over 3,000 of the article. Manufactured and sold by
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—AND—

Best Cast Steel Royal Improved Files, well known as better adapted for Engineers' and Machinists' purposes than any now in use in the United States.

Every description of Square, Octagon, Flat and Round Cast Steel, Sheet, Shovel and Railway Spring Steel, etc., and Steel to order for any purposes—manufactured at their works in Sheffield—and universally known by the old stamp "Globe."

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Faggotted Car and Engine Axles

FORGED by RANSTEAD, DEARBORN & Co.,
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These Axles enjoy the highest reputation for excellence, and are all warranted.

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THE ADIRONDAC STEEL MANUFACTURING CO. is now producing, from American iron, at their works at Jersey City, N.J., Cast Steel of extraordinary quality, and is prepared to supply orders for the same at prices below that of the imported article of like quality. Consumers will find it to their interest to give this a trial. Orders for all sizes of hammered cast steel, directed as above, will meet with prompt attention.
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GRAHAM'S COMPOSITION, to Remove and Prevent Incrustation (or Scale) in STEAM BOILERS.

THIS valuable composition having been fully and extensively tested, is now offered to the public, as a sure remedy and preventive for incrustations in steam boilers of all descriptions. By its use, all scale is entirely removed from the boilers of Ocean and River Steamers, Locomotive and Stationary Engines, in from 3 to 20 running days, according to the size of the boiler and thickness of the scale. In New Boilers, all incrustation is prevented at a trifling expense.

The preservation of the boiler, great economy of fuel and labor, safety, and increased speed, are among the advantages to be derived from the use of this composition.

Orders should state the quality of water used, viz: "Salt," "Fresh," or "Brackish."

For sale, with directions for use, by
W. H. NEWMAN,
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New York.

TESTIMONIALS.

New York, August 17, 1850.

We have used Graham's Composition in the boilers of the Steamship Southerner, during several voyages between this place and Charleston. The boilers were old and very foul with scale, a very large quantity of which was removed by the use of the composition, and no new scale was formed.

From our own experience and observation in the use of the article, we are fully satisfied that it will effectually remove the incrustation made by sea water, and also that it will effectually prevent its formation.

We are also satisfied that the use of it will be attended with a great saving of fuel, and that it has no injurious effect upon iron.

DAVID N. MAXON, Engineer,
BERRY, Master,
Steamship Southerner.

Steamship Philadelphia, }
New York, August 27, 1850.

I have used "Graham's Composition for Steam Boilers," in the boilers of Steamship Philadelphia, on the voyage to and from Chagres, and am entirely satisfied that it will remove, dissolve and prevent all scale or incrustation in salt water boilers.

For the preservation of the boiler and economy of fuel and labor, I hereby recommend the employment of this composition in the Boilers of Ocean Steamers
WM. BISBY,
Chief Engineer.

Novelty Iron Works, }
New York, July 5, 1850.

We have examined the specimen of Graham's Composition for preventing incrustation of steam boilers, and we believe it may be used with perfect safety in reasonable quantities for the purpose intended, as there does not appear to be any agent in the composition calculated to injure the iron.

STILLMAN, ALLEN & CO.

Piermont, May 20, 1850.

I have used "Graham's Composition," and find it to produce the intended effect; and I hereby, without hesitation, recommend it for Stationary, Marine and Locomotive Engine Boilers.

JOHN BRANDT,
Superintendent Motive Power
New York & Erie R.R.

New York, July 25, 1850.

In answer to many inquiries as to the practical effect of "Graham's Composition," I will state that I have used it in the boiler of the Steamboat Sunwick, which had become considerably incrustated with hard scale from both salt and fresh water. We used 10 lbs. per day, for three days, without blowing off the water until the fifth day, when all was drawn off. To our astonishment, we found the whole interior of the boiler as clear of scale and smooth as when it came from the hands of the maker. The following week, we tried the same quantity in a small steam tow boat. The boiler had old scale of long accumulation and very thick. We ran the boat three days without blowing off, and on the fourth day washed out the boiler and found it, like the "Sunwick's," perfectly clean and smooth as when new. I am therefore enabled to state that the use of the composition in these two instances under my own immediate observation and direction, has been attended with complete success.

JAMES MORROW,
Engineer Astoria Ferry



To Merchants, Railroad Companies, Machinists and Boiler Makers.

THE subscribers beg leave to call attention to their very large stock of Iron and Steel—of American, English, Swede and Norway make—of all the different kinds in use. Also, Railroad Iron, Ship, Boat and Railroad Spikes. They are also Agents for the Best Pennsylvania Locomotive Boiler and Tank Iron, each sheet of which will be stamped and warranted, at lowest mill prices. Our prices for all kinds of iron will be found very low, either for cash or approved credit.
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Clement, Wm. H.,

Little Miami Railroad, Cincinnati, Ohio.

Cozzens, W. H.,

Engineer and Surveyor, St. Louis, Mo.

Alfred W. Craven,

Chief Engineer Croton Aqueduct, New York.

Davidson, M. O.,

Eckhart Mines, Alleghany Co., Maryland.

Fisk, Charles B.,

Cumberland and Ohio Canal, Washington, D. C.

Felton, S. M.,

Pittsburgh Railroad, Boston, Mass.

Floyd-Jones, Charles,

South Oyster Bay, L. I.

Gzowski, Mr.,

St. Lawrence & Atlantic Railroad, Montreal, Canada.

Gilbert, Wm. B.,

Rutland and Burlington Railroad, Rutland, Vt.

Grant, James H.,

Nashville and Chattanooga R. R., Nashville, Tenn.

S. W. Hill,

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Holcomb, F. P.

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Johnson, Edwin F.

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Miller, J. F.,

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P. DORSHIMER. BUFFALO.**GUY'S****United States Hotel,**(Opposite Pratt street Railroad Depot),
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American Hotel,Pratt street, opposite the Railroad Depot,
BALTIMORE.HENRY M. SMITH.....Proprietor.
Late of the Exchange & St. Charles Hotels, Pittsburgh.**Washington Hotel,**BY JOHN GILMAN,
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No. 206 Pratt street, (near the Depot),
BALTIMORE.**Barnum's City Hotel,**MONUMENT SQUARE, BALTIMORE.
This Extensive Establishment, erected expressly
for a Hotel, with every regard to comfort and conven-
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commodate 250 Guests. BARNUM & CO.**JONES' HOTEL,**NO. 152 CHESTNUT STREET,
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Wire. 218 PEARL ST., NEW YORK.**Charles T. Jackson, M. D.,**STATE ASSAYER, late Geologist to Maine, Rhode
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offers his services to his friends and the public in mak-
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Manufacturers of Cast, Shear, German, Blister, and
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Of all descriptions, Warranted Good.

FILES.Manufacturers of Machinists' Warranted Best Cast
Steel Files, expressly for working upon Iron and Steel,
made very heavy for recutting.A full Stock of Steel and Files at all times on
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Maryland Mining Company's Cumberland Coal 'CED'
—'Potomac' and other good brands of Pig Iron.**Samuel Kimber & Co.,**COMMISSION MERCHANTS
WILLOW ST. WHARVES, PHILADELPHIA.AGENTS for the sale of Charcoal and Anthracite
Pig Iron, Hammered Railroad Car and Locomo-
tive Axles, Force Pumps of the most approved con-
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Rams, etc., etc.
July, 27, 1849.**James Herron, Civil Engineer,**OF THE UNITED STATES NAVY YARD,
PENSACOLA, FLORIDA.,

PATENTEE OF THE

HERRON RAILWAY TRACK.Models of this Track, on the most improved plans,
may be seen at the Engineer's office of the New York
and Erie Railroad.

PLUSHES

FOR
Railway Cars & Omnibuses.
F. S. & S. A. MARTINE,
112 WILLIAM ST., NEAR JOHN.

ARE now receiving a large and complete assortment of Plain and Figured PLUSHES, of their own importation, which will be sold at the lowest market price, viz: Crimson, Maroon, Scarlet, Green, Blue, Purple, etc.

ALSO—CURLED HAIR, the best manufactured in market.

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Machinists, Car Man-
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CHARLES T. GILBERT,
NO. 80 BROAD ST., NEW YORK.

IS prepared to contract for furnishing at manufacturer's prices—

Railroad iron,
Locomotive Engines,
Passenger and Freight Cars,
Car Wheels and Axles,
Chairs and Spikes.

Orders are invited; and all inquiries in relation to any of the above articles will receive immediate attention.

**Manufacture of Patent Wire
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For Inclined Planes, Suspension Bridges, Standing Rigging, Mines, Cranes, Derrick, Tillers, &c., by
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MANUFACTURERS OF
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WROUGHT IRON SHAFTING,

And All Kinds of Hammered Shapes.
Office 25 Foster's Wharf, Boston.

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MERCHANT, AND MANUFACTURER OF
CAST STEEL WARRANTED SAWS,
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IMPORTER OF THE
GENUINE WICKESLY GRINDSTONES
NO. 8 LIBERTY STREET,
NEW YORK.

Railroad Instruments.

THEODOLITES, TRANSIT COMPASSES,
and Levels, with Fraunhofer's Munich Glasses,
Surveyor's Compasses, Chains, Drawing Instruments,
Barometers, etc., all of the best quality and
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E. & G. W. BLUNT,

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Pig Iron, Anthracite and Charcoal; Boiler and Flue
Iron, Spring and Blistered Steel, Nail Rods, Best Re-
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Castings, Cast Iron Pipes of all sizes, Railway Chairs
of approved patterns for sale by

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DEALERS IN IRON AND IRON
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AGENTS for the Balt. City Rolling Mill, from
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Ellicott's round, square, and flat bar iron, puddled
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Nos. 18 and 20 South Charles st., Baltimore.

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100 Tons "Columbia" No. 2 Cold Blast Charcoal
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300 Tons "Salisbury" No. 1, do. do.
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THE subscribers are prepared to make and execute
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139 Greenwich st. corner of Cedar.

Railroad Iron.

1650 Tons, weighing about 61 lbs. per yard, 40
tons, weighing about 52 lbs. per yard, and
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est and most approved patterns of T rail, for sale by
BOORMAN, JOHNSTON & CO.,
119 Greenwich street.
New York, Aug. 26, 1850.

N.B.—B. J. & Co are also prepared to take con-
tracts for English rails, delivered in any of the Atlan-
tic ports of the United States.

Railroad Iron.

THE undersigned, Agents for Manufacturers, are
prepared to contract to deliver Rails of superior
quality, and of any size or pattern, to any ports of dis-
charge in the United States.

COLLINS, VOSE & CO.
74 South St.

New York, June 1, 1850.

Railroad Iron.

1,500 Tons weighing 53 lbs. per lineal yard.
500 " " 57 " "
500 " " 56 " "
500 " " 60 & 61 lbs. "

Also 2½ flat rails. All the above being of approv-
ed patterns. For sale by
DAVIS, BROOKS, & CO.,
68 Broad street.

N.B.—Rails imported on commission, or at a fixed
price.

**Railroad Spikes, Boiler Riv-
ets, etc.**

THE Subscribers, Agents for the sale of James S.
Spencer's, Jr., Railroad and Boat Spikes, Boiler
Rivets, and Wrought Iron Chairs for Railroads, made
at his Works near this city, will execute all orders
with promptness, despatch, and of the best quality.

ALSO IMPORTERS of English refined and Mer-
chant bar Iron; Extra refined Car and Locomotive
Axles (from 3½ to 6½ inches in diameter); B. O. Lo-
comotive Tire (welded by Baldwin). Also, supply
Boiler and Flue Iron cut to pattern or otherwise—
Spring, Shear, and Cast Steel, etc., etc.

T. & E. GEORGE.

Philadelphia, November 14, 1850.

Railroad Iron.

THE UNDERSIGNED, HAVING made arrange-
ments abroad, are prepared to contract for the del-
ivery of Foreign rails, of approved brands upon the
most favorable terms.

They will also make contracts for American rails,
made at their Trenton works, from Andover Iron, in
whole or in part, as may be agreed upon.

They are prepared to furnish Telegraph, Spring and
Market Wire; Braziers and Wire Rods; Rivets and
Merchant Bars to order, all made exclusively from An-
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of the very best quality for special purposes, is respect-
fully invited.

COOPER & HEWITT,
17 Burling Slip, New York.

February 15, 1850.

Railroad Iron.

THE Undersigned, Agents for Manufacturers, are
prepared to contract for the delivery of English,
Welsh and Scotch Rails, of any pattern and weight,
also for every description of English, Welsh, Scotch,
and Swedish Iron, Railway Chairs and Spikes, Riv-
ets, Bolts, Nuts, Washers, Chain Cables, Anchors,
Tin Plates, German Spelter, Iron Castings, and every
description of Machinery.

WILLIAM BIRD & CO.,
Iron and Tin Plate Merchants,
44 Wall st., New York.

And at 5 Martin's Lane, City, London,
and 140 Buchanan st., Glasgow.

July 27th, 1850.

Glendon Refined Iron.

Round Iron, Band Iron, Hoop Iron,
Square " Flat " Scroll "
Axles, Locomotive Tyres,
Manufactured at the Glendon Mills, East Boston, for
sale by **GEORGE GARDNER & CO.,**
5 Liberty Square, Boston, Mass.
Sept. 15, 1849. 3m37

**PATENT HAMMERED RAILROAD, SHIP &
BOAT SPIKES.**—The Albany Iron Works
have always on hand, of their own manufacture, a
large assortment of Railroad, Ship and Boat Spikes
from 2 to 12 inches in length, and of any form of head
From the excellence of the material always used in
their manufacture, and their very general use for rail
roads and other purposes in this country, the manu-
facturers have no hesitation in warranting them fully
equal to the best spikes in market, both as to quality
and appearance. All orders addressed to the subscrib-
ers at the works will be promptly executed.

JOHN F. WINSLOW, Agent.

Albany Iron and Nail Works, Troy, N. Y.
The above Spikes may be had at factory prices, of
Erastus Corning & Co Albany; Meritt & Co., New
York; E. Pratt & Br., New York; E. B. Moore, Md.

**LAP—WELDED
WROUGHT IRON TUBES**

FOR

TUBULAR BOILERS,
FROM ONE AND A QUARTER TO SEVEN
INCHES IN DIAMETER.

THE ONLY Tubes of the same quality and man-
ufacture as those so extensively used in England,
Scotland, France and Germany, for Locomotive, Ma-
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THOMAS PROSSER & SON, Patentees,
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Railroad Iron.

THE UNDERSIGNED ARE PREPARED TO
contract for the delivery of English Railroad Iron
of favorite brands, during the Spring. They also re-
ceive orders for the importation of Pig, Bar, Sheet, etc.
Iron.

THOMAS B. SANDS & CO.,
73 New street,
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February 3, 1849.

Iron Store.

THE Subscribers, having the selling agency of the
following named Rolling Mills, viz: Norristown,
Rough and Ready, Kensington, Philadelphia, Port-
grove and Thorndale, can supply Railroad Companies,
Merchants and others, at the wholesale mill prices for
bars of all sizes, sheets cut to order as large as 68 in.
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comotive tire welded to given size; Chairs and Spikes;
Iron for shafting, locomotive and general machinery
purposes; Cast, Shear, Blister and Spring Steel; Boil-
er rivets; Copper; Pig iron, etc., etc.

MORRIS, JONES & CO.,

Iron Merchants,
Schuylkill 7th and Market Sts., Philadelphia.
August 16, 1849. 1y33

Railroad Iron.

THE MOUNT SAVAGE IRON WORKS, AL-
legany county, Maryland, having recently pas-
sed into the hands of new proprietors, are now prepar-
ed, with increased facilities, to execute orders for any
of the various patterns of Railroad Iron. Communi-
cations addressed to either of the subscribers will have
prompt attention. **J. F. WINSLOW, President**
Troy, N.Y.

ERASTUS CORNING, Albany
WARREN DELANO, Jr., N.Y.
JOHN M. FORBES, Boston.
ENOCH PRATT, Baltimore, Md.

November 6, 1848.

Railroad Iron.

THE SUBSCRIBERS ARE PREPARED TO
take orders for Railroad Iron to be made at their
Phoenix Iron Works, situated on the Schuylkill Riv-
er, near this city, and at their Safe Harbor Iron Works,
situated in Lancaster County, on the Susquehanna
river; which two establishments are now turning out
upwards of 1800 tons of finished rails per month.

Companies desirous of contracting will be promptly
supplied with rails of any required pattern, and of the
very best quality.

REEVES, BUCK & CO.
45 North Water St. Philadelphia.

March 15, 1849.

Monument Foundry.

A. & W. DENMEAD & SON,
Corner of North and Monument Sts.,—Baltimore.

HAVING THEIR

"IRON FOUNDRY AND MACHINE SHOP"

In complete operation, are prepared to execute faithfully and promptly, orders for Locomotive or Stationary Steam Engines, Wooden, Cotton, Flour, Rice, Sugar Grist, or Saw Mills.

Slide, Hand or Chuck Lathes, Machinery for cutting all kinds of Gearing. Hydraulic, Tobacco and other Presses, Car and Locomotive patent Ring Wheels, warranted,

Bridge and Mill Castings of every description, Gas and Water Pipes of all sizes, warranted, Railroad Wheels with best faggotted axle, furnished and fitted up for use, complete

Being provided with Heavy Lathes for Boring and Turning Screws, Cylinders, etc., we can furnish them of any pitch, length or pattern.

Old Machinery Renewed or Repaired—and Estimates for Work in any part of the United States furnished at short notice.

June 8, 1849.

RAILROAD CAR AND COACH TRIMMINGS.

Doremus & Nixon,
IMPORTERS AND FURNISHERS

HAVE FOR SALE

Plain Garnet Plush. Fig. Garnet Plush (Butterfly pat. "Crimson" "Crimson" "Elegant." "Scarlet" " " "Gen. Taylor.

BROCATELLES.

Crimson Silk Brocatelles. Gold and Maroon do. Gold and Blue " " Brown do. Silk and Wool " of every color.

MOQUETTES,

Of elegant designs and colors.

GERMAN CLOTH FOR CAR LININGS.

The most beautiful goods ever shown in this country, and the subscribers are the sole agents for the sale of them.

Oil cloths Enamelled with Gold. These goods can be " " Silver, furnished in any Do. Silver ground velvet printed. dimensions req'd.

CURLED HAIR

Of every description and quality.

JNO. W. A. STRICKLAND, Agent.
New York, 1850. 1yl6

FOWLER M. RAY'S Patent India-rubber Railroad CAR SPRING.

New York and Erie Railroad Shops,
Piermont, March 26, 1850.

This will certify that from practical experience in the use of Fowler M. Ray's India rubber Car Springs, I believe them to be far superior to any others now in use.

I have never known them to be affected by any change of temperature, as other Rubber Springs have been affected on this road.

I am at the present time repairing a Passenger Car that Mr. Ray and myself mounted with his springs about two years and eight months since.

The springs are at the present time as perfect, to all appearances, as when first applied to the car.

Respectfully yours,

HORACE B. GARDNER,
Foreman of the Car Shops.

Supt. Office N.Y. & H. R.R.,
New York, March 8, 1850.

This is to certify that we have used the Rubber Springs manufactured by Mr. F. M. Ray for the past twenty months, "both for Passenger and Freight Car Springs and Bumpers, and of different sizes," and have in every case given entire satisfaction, and I consider them the best spring now in use.

M. SLOAT, Supt.

Boston, March 5, 1850.

In answer to your enquiry about India-rubber Springs, I have to say that we have used them to a considerable extent on both freight and passenger cars, and also on several of our tenders; and I am very well satisfied that they answer all the purposes for which they are intended. I believe the India-rubber will soon supersede all other springs for cars and tenders.

Yours truly,

S. M. FELTON,
Supt. Fitchburg Railroad.

Office New Jersey Railroad Co.,
Jersey City, March 8, 1850.

FOWLER M. RAY, Esq.,

Dear Sir: In answer to your enquiries respecting the operation of the Vulcanized Rubber Springs, purchased by our company from you some two years since, I reply that they are superior to any spring in use, (that I have either seen or heard of).

The improved form of your spring, consisting of a solid piece of vulcanized rubber with bands on the outside, is far superior to your first form, consisting of disks of rubber with metallic plates interposed.

The last named form was tried, if you recollect, at a much earlier period; and then was replaced by your last form.

I have no hesitation in saying that your springs have given entire satisfaction, and most cheerfully recommend them to railroad companies throughout the country for the following reasons:

1st. The cost is 30 per cent. less.
2d. Saving of weight on each car of 8 wheels from 700 to 900 lbs.

3d. Less care and attention is required, as they are not liable to get out of repair.

4th. A great saving is secured in the wear and tear of the cars and rails from their great elasticity.

5th. The freedom from noise.

6th. There is greater safety in case of accident, as they cannot be broken.

7th. The comfort of passengers is enhanced sufficiently to pay the expense, waiving all the other reasons that I have given.

Should this fail to satisfy any person enquiring, you are at liberty to refer to me, No. 150 Washington St., Jersey City.

Yours respectfully,
T. L. SMITH, Supt.

New York, March 11, 1850.

I have used the Patent India-rubber Spring purchased of Mr. Ray, upon the cars of the New York and New Haven Railroad, and have found them efficient and economical; and when applied to the axles and draw springs, believe them to be quite equal to any in use. I have found a combination of these springs with a steel spring under the transom beam a very satisfactory arrangement, and am now using this plan in all new cars.

Yours respectfully,
ROBERT SCHUYLER.

February 25, 1850.

From practical observation of the use of the India-rubber Car Springs, manufactured and sold by your company, we are entirely satisfied in their application, and do not hesitate to recommend them as elastic, durable, requiring no repairs for years, and retaining their consistency during all extremes of weather. We have applied them for the past two years, and consider them superior for all railroad purposes.

Yours truly

OSGOOD BRADLEY, Car Builder, Worcester.
T. & G. WASON, do. Springfield.
DEAN, PACKARD & MILLS, do. do.
DAVENPORT & BRIDGES, do. Cambridgeport.

Office of the New Jersey Railroad Co.,
Jersey City, March 7, 1850.

This is to certify that we have had Mr. F. M. Ray's India-rubber Springs in constant use under our cars, and as Bumper Springs for upwards of two years, and they have in every way given perfect satisfaction.

The present form of spring we deem far superior to the form of Disk, having used both forms, although we have none of those made in Disks at present in use.

We take pleasure in recommending these springs to all railroad companies.

J. P. JACKSON, Vice Prest.
New Jersey Railroad and Trans. Co.

Roxbury, February 28, 1850.

In compliance with your request, I take great pleasure in stating the result of my experience in the use of "Ray's Patented Vulcanized India-rubber Car and Engine Springs." We have used them nearly two years, and never had one fail in any way. The cold weather does not affect them, as it has other rubber springs we have used.

With sixteen years' experience as superintendent of machinery on the Boston and Providence railroad, I take pleasure in saying that your springs are the best we ever used, or I ever saw used elsewhere. We have 20 cars rigged with them, of which I can say that the springs are as good now as when first applied. I put 24 lbs. of the rubber under the forward end of one of our heaviest engines, taking off 250 lbs. of steel springs—it has been in use 18 months, and is in as good condition now as when first put under the engine.

Very respectfully yours,

GEO. S. GRIGGS,
Supt. of Machinery, Boston and Prov. R.R.

Fall River, February 2, 1850.

In answer to yours of the 20th ult. I would say that this company has for some 10 or 12 months past been using "Ray's India-rubber Springs." We have applied them to both passenger and freight cars with uniform success. They have invariably preserved their elasticity and consistency through all the extremes of weather; and we are now applying them whenever the steel spring fails. I am well satisfied that they are particularly adapted for railroad purposes.

Very respectfully yours,

GEO. HAVEN,
Supt. Fall River Railroad.

Jersey City, March 9, 1850.

This is to certify that the present form of Mr. F. M. Ray's India-rubber Car Spring I consider far superior to the form of Disk, having used both forms.

I take pleasure in recommending these springs to all railroad companies.
DAVID H. BAKER,
Foreman of Car Shop of N.J. R.R. & Trans. Co.

Harlem R.R. Depot,

New York, March 7, 1850.

This is to certify that we have used Mr. F. M. Ray's India-rubber Springs for over eighteen months, and find them to be easy and durable, and recommend them to railroad companies as being superior to anything we have tried.

J. M. SMART,
Foreman at 42d St. Depot.

Old Colony Railroad Office,
Boston, March 6, 1850.

EDWARD CRANE, Esq.,

President New England Car Co.,

Dear Sir: In compliance with your request I would state that the Old Colony Railroad Company have had in use upon their road, India-rubber Springs furnished by your company, for more than eighteen months past, during which time they have been extensively used under Passenger and Freight Cars, Locomotive Tenders, and for Drawer and Buffing Springs, with the most perfect success. The elasticity and consistency of the Rubber has never been unfavorably affected by either extremes of heat or cold—and from the experience which we have had in the use of Rubber Springs, I think them well adapted for railroad purposes—and therefore we have for some months past used Rubber almost exclusively, in all places where springs are required.

Respectfully yours, etc.,

JAS. H. MOORE,
Supt. O. C. Road.

Troy, February 27, 1850.

We have been using your India-rubber Car Springs for nearly two years—and we take pleasure in saying that in our opinion the rubber has to a certain extent already, and may eventually entirely supersede all other Springs for Railroad Car purposes. We now use it entirely for Draw Springs and Bumpers, considering it better and lighter than steel.

During our two years' experience in the use of it, we have not known any to lose their elasticity, or fail in any way; and we cheerfully recommend the rubber for railroad car springs. Very respectfully,

EATON, GILBERT & CO.

Passenger Car Linings.

THE Advertiser continues to make to order the Enamelled Car Linings which have been so highly approved the last three years, and are now exclusively used by all the Northern Railroads. No pains are spared to get out new styles, and adapt them to the tastes of every consumer.

Orders addressed to **CHARLES STODDER, No. 75 Kilby street, Boston,** will have prompt attention.
March 23, 1850. 2m

India-rubber for Railroad Cos.

RUBBER SPRINGS—Bearing and Buffer—Fowler's Patent—Hoses from 1 to 12 inches diameter. Suction Hose. Steam Packing—from 1-16 to 2 in. thick. Rubber and Gutta Percha Bands. These articles are all warranted to give satisfaction, made under Tyer & Helm's patent, issued January, 1849.—No lead used in the composition. Will stand much higher heat than that called "Goodyear's," and is in all respects better than any in use. Proprietors of railroads do not be overcharged by pretenders.

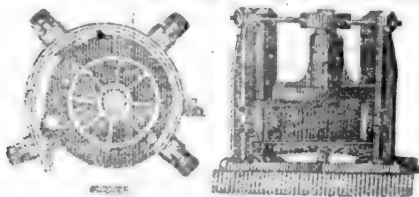
HORACE H. DAY,
Warehouse 23 Courtlandt street,
New York, May 21, 1849.

Spikes, Spikes, Spikes.

ANY person wishing a simple and effective Spike Machine, or a number of them, may be supplied by addressing
J. W. FLACK,
Troy, N. Y.
March 6, 1850.

MACHINERY.

Henry Burden's Patent Revolving Shingling Machine.



THE Subscriber having recently purchased the right of this machine for the United States, now offers to make transfers of the right to run said machine, or sell to those who may be desirous to purchase the right for one or more of the States.

This machine is now in successful operation in ten or twelve iron works in and about the vicinity of Pittsburgh, also at Phoenixville and Reading, Pa., Covington Iron Works, Md., Troy Rolling Mills, and Troy Iron and Nail Factory, Troy, N. Y., where it has given universal satisfaction.

Its advantages over the ordinary Forge Hammer are numerous; considerable saving in first cost; saving in power; the entire saving of shingler's, or hammerman's wages, as no attendance whatever is necessary, it being entirely self-acting; saving in time from the quantity of work done, as one machine is capable of working the iron from sixty puddling furnaces; saving of waste, as nothing but the scoria is thrown off, and that most effectually; saving of staffs, as none are used or required. The time required to furnish a bloom being only about six seconds, the scoria has no time to set, consequently is got rid of much easier than when allowed to congeal as under the hammer. The iron being discharged from the machine so hot, rolls better and is much easier on the rollers and machinery. The bars roll sounder, and are much better finished. The subscriber feels confident that persons who will examine for themselves the machinery in operation, will find it possesses more advantages than have been enumerated. For further particulars address the subscriber at Troy, N. Y.

P. A. BURDEN.

Railroad Spikes and Wrought Iron Fastenings.

THE TROY IRON AND NAIL FACTORY, exclusive owner of all Henry Burden's Patented Machinery for making Spikes, have facilities for manufacturing large quantities upon short notice, and of a quality unsurpassed.

Wrought Iron Chairs, Clamps, Keys and Bolts for Railroad fastenings, also made to order. A full assortment of Ship and Boat Spikes always on hand.

All orders addressed to the Agent at the Factory will receive immediate attention.

P. A. BURDEN, Agent,

Troy Iron and Nail Factory, Troy, N. Y.

CHILLED RAILROAD WHEELS.—THE UNDERSIGNED are now prepared to manufacture their Improved Corrugated Car Wheels, or Wheels with any form of spokes or discs, by a new process which prevents all strain on the metal, such as is produced in all other chilled wheels, by the manner of casting and cooling. By this new method of manufacture, the hubs of all kinds of wheels may be made whole—that is, without dividing them into sections—thus rendering the expense of banding unnecessary; and the wheels subjected to this process will be much stronger than those of the same size and weight, when made in the ordinary way.

A. WHITNEY & SON,
Willow St., below 13th,
Philadelphia, Pa.

Brown's Old Established SCALE WARE HOUSE,

NO. 234 WATER ST., NEW YORK.

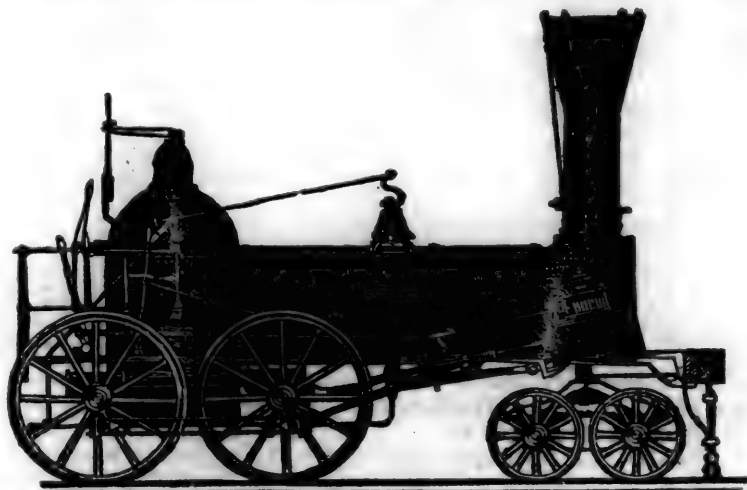
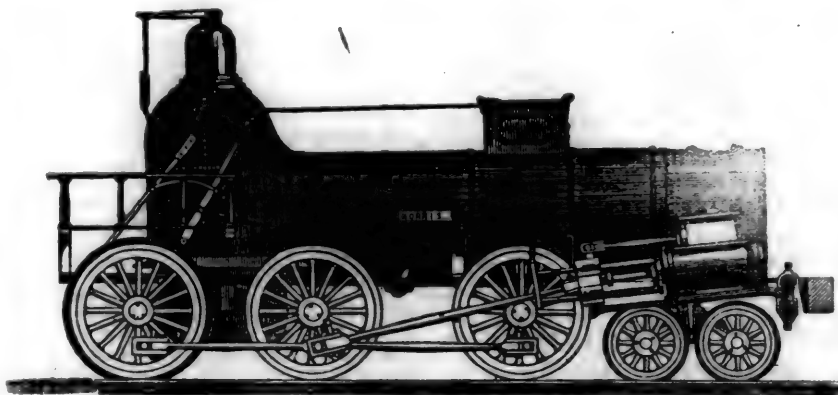
THE Subscriber, Practical Manufacturer of Scales of every description, respectfully asks the attention of Railroad Companies to his Improved Wrought Iron Railroad Track and Depot Scales which for strength, durability, accuracy, convenience in weighing, and beauty of workmanship, are not surpassed by any others in this country.

He is aware that this is rather a bold assertion for him to make, yet he can say with confidence that they have but to be tried to give them precedence over all others.

J. L. BROWN.

Bank Scales made to order, and all Scales of his make Warranted in every particular.

Referer given if required

NORRIS' LOCOMOTIVE WORKS.
BUSHHILL, SCHUYLKILL SIXTH-ST., PHILADELPHIA,

THE UNDERSIGNED Manufacture to order Locomotive Steam Engines of any plan or size. Their shops being enlarged, and their arrangements considerably extended to facilitate the speedy execution of work in this branch, they can offer to Railway Companies unusual advantages for prompt delivery of Machinery of superior workmanship and finish.

Connected with the Locomotive business, they are also prepared to furnish, at short notice, Chilled Wheels for Cars of superior quality.

Wrought Iron Tyres made of any required size—the exact diameter of the Wheel Centre, being given, the Tyres are made to fit on same without the necessity of turning out inside.

Iron and Brass castings, Axles, etc., fitted up complete with Trucks or otherwise.

NORRIS, BROTHERS

PATENT MACHINE MADE HORSE-SHOES.

The Troy Iron and Nail Factory have always on hand a general assortment of Horse Shoes, made from Refined American Iron.

Four sizes being made, it will be well for those ordering to remember that the size of the shoe increases as the numbers—No. 1 being the smallest.

P. A. BURDEN, Agent,
Troy Iron and Nail Factory, Troy, N. Y.

Etna Safety Fuse.

THIS superior article for igniting the charge in wet or dry blasting, made with DUPONT'S best powder, is kept for sale at the office and depot of

REYNOLDS & BROTHER,

Manufacturers, No. 85 Liberty St.

NEW YORK.

And in the principal cities and towns in the U. States.

The Premium of the AMERICAN INSTITUTE was awarded to the Etna Safety Fuse at the late Fair held in this city.

November 3, 1849.

17

COLUMBUS, OHIO,
Railroad Car Manufactory.
RIDGWAYS & KIMBALL,

HAVE established at this central point, the manufacture of Passenger, Freight, Gravel and Hand Cars for Railroads, and assure all Western Railroad Companies that it will be their constant aim to procure the best materials and workmen, and to turn out the best kind of work at fair prices. Specimens may be seen on the Columbus and Xenia Railroad. The patronage of Railroad Companies is respectfully solicited.

1y8

FOR SALE.

THREE LOCOMOTIVES, Manufactured by M. W. Baldwin, of 10 tons weight, all in complete repair, and now running on the Columbia and Philadelphia Railroad.

For particulars apply to A. L. Roumfort, Supt. of said road, either at Philadelphia, or Parkersburg, Chester county.

A. L. ROUMFORT,

Supt. Motive Power Col. & Philad. R.R.

AMERICAN RAILROAD JOURNAL.

STEAM NAVIGATION, COMMERCE, MINING, MANUFACTURES.

HENRY V. POOR, Editor.

ESTABLISHED 1831.

PUBLISHED WEEKLY, AT No. 136 NASSAU ST., NEW YORK, AT FIVE DOLLARS PER ANNUM IN ADVANCE.

SECOND QUARTO SERIES, VOL. VI., No. 51. SATURDAY, DECEMBER 21, 1850. [WHOLE No. 766, VOL. XXIII.]

ASSISTANT EDITORS,

J. T. HODGE, *For Mining and Metallurgy.*

GEN. CHAS. T. JAMES, *For Manufactures and the Mechanic Arts.*

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American Railroad Journal.

PUBLISHED BY J. H. SCHULTZ & Co., 136 NASSAU ST.

Saturday, December 21, 1850.

Railroad Officers.

Bellefontaine and Indiana Railroad, Ohio.

The stockholders in this company met at Bellefontaine, Ohio, on the 3d inst., and elected the following officers to serve for the ensuing year:

Directors.	County.	Postoffice.
James H. Godman,	Marion,	Marion.
Wm. L. Kendrick,	"	"
Josiah S. Copeland,	"	"
Aaron Hartley,	Logan,	Bellefontaine.
John Mills,	Shelby,	Sidney
Hugh McElroy,	"	"
Levi Houston,	"	Houston.

James H. Godman, President.

Wm. L. Kendrick, Secretary and Treasurer.

At a meeting of the board held the same evening, W. Milnor Roberts was unanimously re-elected Chief Engineer, and the appointment of Israel Pemberton and Alexander Worrall Resident Engineers, was confirmed.

The board directed, also, that proposals should

be received for the grubbing, clearing and grading, on the residue of the line not yet under contract, viz: 25 miles from Loramie Creek to the Indiana State Line, where this road connects with the "Indianapolis and Bellefontaine railroad"—proposals for which to be received at Jacksonville, Darke county, Ohio, until January 21st, next; and about 40 miles between Marion and Bellefontaine—proposals for which to be received at Marion, Ohio, until the 5th of January next.

The force now engaged on the portions formerly let, is over 1000 men and horses.

The Bellefontaine and Indiana railroad is an important link in the great lines of railroads reaching out from Boston, New York, Philadelphia and Baltimore, to St. Louis.

Galion is its present eastern terminus, and point of connection with the Cleveland, Columbus and Cincinnati railroad, 79 miles from Cleveland; tho' the company have the right to construct their road as far as Mansfield. At Galion, or its vicinity, the Ohio and Pennsylvania railroad will terminate, and connect with the Bellefontaine and Indiana line—making a continuous chain from Philadelphia and Baltimore.

The completion of the Lake Shore railroads from Buffalo and Dunkirk to Cleveland will open up continuous lines to the same point from Boston and New York. The Lake shore roads, and the Ohio and Pennsylvania road, will, it is believed, be finished in 1852. The Cleveland, Columbus and Cincinnati railroad will be opened for use throughout, during the present winter. It is now in operation to within four miles of Galeon, and will be opened to that place in a few days.

From the terminus of the Bellefontaine and Indiana road, at the western boundary of Ohio, the Indiana companies have their roads, which form its continuation, in a great state of forwardness; and the gentlemen interested in those works, feel entirely confident of opening them for use across the State during the year 1852—reaching to Terre Haute.

In this aspect of affairs, the officers of the Bellefontaine and Indiana company, and the people along the route, are determined not to be behind in the race, and every effort will be made to finish it in time to meet the roads at both ends with a completed line, in 1852. With this object in view, all the heavy grading and heavy masonry, which are

comprised in a space of 33 miles, extending from Bellefontaine to Loramie creek, ten miles west of Sidney, was put under contract last May, about three months after the completion of the preliminary surveys. About 20 miles, from Galeon to Marion, were also let soon afterwards. Most of the heavy masonry was finished this season, and the grading on the parts let is more than one third done. The residue of the grading, to be let in January and February, is comparatively light work.

On the completion of the various lines referred to, the distances from the principal eastern cities to prominent points in the west, will be about as follows:

BY LAKE SHORE ROUTE.

From *Boston* to Galion 791 miles, to Bellefontaine 851 miles, to Cincinnati 954 miles, to Sidney 873 miles, to Indianapolis 997 miles, to Terre Haute 1063 miles, to St. Louis 1233 miles.

From *New York* to Galion 697 miles, to Bellefontaine 757 miles, to Cincinnati 860 miles, to Sidney 719 miles, to Indianapolis 900 miles, to Terre Haute 972 miles, to St. Louis 1142 miles.

BY PENNSYLVANIA ROUTE.

From *New York* to Galion 630 miles, to Bellefontaine 690 miles, to Cincinnati 793 miles, to Sidney 712 miles, to Indianapolis 830 miles, to Terre Haute 902 miles, to St. Louis 1072 miles.

From *Philadelphia* to Galion 540 miles, to Bellefontaine 600 miles, to Cincinnati 703 miles, to Sidney 623 miles, to Indianapolis 740 miles, to Terre Haute 812 miles, to St. Louis 982 miles.

BY PENNSYLVANIA ROUTE, THROUGH HARRISBURG.

From *Baltimore* to Galion 517 miles, to Bellefontaine 577 miles, to Cincinnati (via Dayton) 690 miles, to Sidney 599 miles, to Indianapolis 717 miles, to Terre Haute 789 miles, to St. Louis 959 miles.

The eastern terminus of the Bellefontaine and Indiana railroad is the great battle field, where Boston and New York is to contend with Philadelphia and Baltimore for the western railroad trade and travel; but from the rapid growth of the whole country, it to be hoped that there may be business enough to satisfy the reasonable desires of all. There seems to be no danger of finishing railroads in the west faster than the demands of commerce require them. Look at the business on the Michigan Central railroad, which during the current year yielded nearly a million of dollars of tolls.

Three hundred thousand dollars greater than the preceding year!

Report of the Secretary of the Treasury.

TREASURY DEPARTMENT, Dec. 18, 1850.

The Secretary of the Treasury reports:

Receipts and Expenditures.

The receipts and expenditures for the fiscal year ending June 30, 1850, were:

Receipts from customs.....	\$39,668,686 42
" public lands.....	1,859,894 25
" miscellaneous sources.....	1,847,218 23
" avails of stock issued for specie deposited.....	399,050 00
" avails of treasury notes funded.....	3,646,900 00

\$47,421,748 96

Add balance in the treasury July 1, 1849.....

\$49,606,713 18

The expenditures for the same fiscal year were in cash.....\$39,355,268 69

Treasury notes funded.....3,646,900 00

43,002,168 69

\$6,604,544 49

Leaving a balance in the treasury July 1, 1850, of (as appears in detail by accompanying statement A.)

Estimates.

The estimated receipts and expenditures for the fiscal year ending June 30th, 1851, are:

Receipts from customs, first quarter by actual returns.....	\$14,764,043 05
" customs, 3d, 2d and 4th quarter, as estimated.....	30,235,956 95

\$45,000,000 00

Receipts from public lands.....1,967,000 00

" miscellaneous sources.....625,000 00

\$47,592,000 00

Receipts from avails of treasury notes funded.....116,050 00

\$47,708,050 00

Add balance in the treasury July 1, 1850.....6,604,544 49

\$54,312,594 49

Expenditures, viz:

The actual expenditures for the quarter ending September 30, 1850, were—as appears by accompanying statement B.....\$6,953,433 99

The estimated expenditures during the other three quarters, from 1st Oct. 1850, to 30th June, 1851, are, civil list, foreign intercourse and miscellaneous.....13,719,094 31

Expenses of collecting the revenue from customs.....1,500,000 00

Expenses of collecting the revenue from land.....170,835 00

Army proper, etc.....9,099,716 72

Fortifications, ordnance, arming militia, etc.....2,261,370 60

Internal improvements, etc.....327,309 76

Indian department.....4,363,867 51

Pensions.....1,350,583 40

Naval establishment.....9,508,858 80

Interest on public debt.....3,694,321 03

Purchase of stock of the loan of 1847.....844,307 24

53,853,597 50

Leaving a balance in the treasury, July 1, 1851.....\$458,966 99

The estimated receipts and expenditures for the fiscal year, commencing July 1, 1851, and ending June 30, 1852, are:

Receipts from customs.....\$45,000,000 00

" public lands.....1,600,000 00

" miscellaneous sources.....200,000 00

\$46,800,000 00

Add estimated balance in the treasury, July 1, 1851.....458,966 99

\$47,258,966 99

The expenditures for the same period, as estimated by the several departments of state, treasury, interior, war, navy and postmaster general, are:

Balance of former appropriations, which will be required to be expended this year.....\$4,929,934 97

Permanent and indefinite appropriations.....9,525,279 17

Specific appropriations asked for this year.....33,667,489 04

\$48,124,993 18

This sum is composed of the following particulars, viz:

Civil list, foreign intercourse and miscellaneous, including Mexican indemnity.....\$12,713,625 15

Expenses of collecting revenue from customs.....2,450,000 00

Expenses of collecting revenue from lands.....170,200 00

Army proper, etc.....10,287,151 80

Fortifications, ordnance, arming militia, etc.....2,307,575 46

Internal improvements, etc.....1,330,778 89

Indian department.....1,751,517 76

Pensions.....2,645,900 00

Naval establishment including dry dock and ocean steam mail contracts.....10,159,375 00

Interest on public debt.....3,665,331 03

Purchase of stock of the loan of 1847.....340,156 96

Redemption of stock issued under act 9th August, 1846.....303,391 04

\$48,124,993 18

Estimated expenditures over estimated means up to July 1, 1852.....\$865,996 19

The foregoing does not include the interest to be paid on the Texas boundary stock.

Expenses.

For the three years prior to the war, the aggregate expenditures, exclusive of trust funds, public debt, and the expenses of collecting the revenue from

Customs, land, etc., were.....\$63,833,704 93

Averaging annually.....\$21,277,901 64

For the three years of the war.....125,201,017 11

Averaging.....41,733,672 37

And for the three years immediately subsequent thereto.....116,923,178 82

Averaging annually.....38,974,059 61

Including the expenses of collecting the revenue from customs, public lands, duties returned, drawbacks, debentures, bounties, etc., none of which have appeared in the expenditures heretofore exhibited prior to the 30th June, 1849, [as all these items were, previously to that date deducted from the revenue before the latter was paid into the treasury, leaving only the net receipts to figure in the annual statements] the aggregate expenditure for the period [per statement H] will be seen to have been.....76,230,541 83

Averaging.....25,410,180 61

For the second period.....137,189,666 97

Averaging.....45,729,888 99

And for the third period.....125,106,754 18

Averaging.....41,702,251 39

PUBLIC DEBT.

According to the last annual report from this department the public debt on the 1st December, 1849, including \$18,821 45 in treasury notes and stock not then stated, was.....\$64,723,515 16

Since that period the public debt has been reduced.....\$495,276 79

The public debt on the 30th November last was \$64,228,238 37, as per statement D, viz:

Old funded and unfunded debt redeemable on presentation.....119,585 98

Debts of the district cities assumed by Congress, \$60,000, payable annually.....	900,000 00
Five per cent stock per act of August, 1846, redeemable August 9, 1851.....	303,573 92
Five per cent loan of March, 1843, redeemable July 1, 1853.....	6,468,231 35
Six per cent loan of 22d July, 1846, redeemable Nov. 12, 1856.....	4,999,149 45
Six per cent loan of 15th April, 1842, redeemable Dec. 31, 1862.....	8,198,686 03
Six per cent loan of 28th January, 1847, redeemable 1st Jan., 1868.....	27,135,123 00
Six per cent loan of Jan. 28, 1847, redeemable Jan. 1st, 1868.....	154,328 00
Six per cent loan of 31st March, 1848, redeemable July 1, 1868.....	15,740,000 00
Treasury notes issued prior to 1846, payable on presentation, if converted into stock, under the act of January 28, 1847, will be redeemable July 1, 1868.....	209,561 64

\$64,228,238 37

ESTIMATES.

The total actual cash receipts into the treasury from all sources during the fiscal year ending 30th June, 1850, were.....\$43,774,848 90

The total cash expenditures for the same period were.....39,355,268 69

Actual and estimated cash receipts from all sources for the year ending June 30, 1851, are.....47,592,000 00

Actual and estimated cash expenditures for the same period amount to.....53,737,547 50

The total estimated cash receipts for the year ending June 30th, 1852, amount to.....46,800,000 00

The total estimated cash expenditures for the same period amount to (see statement G).....48,124,993 18

Actual and estimated expenditures for the seven years ending on the 30th June, 1852, amount to [statement I].....294,807,407 95

And the expenditures for the year ending 30th June, 1845, the year immediately preceding the war with Mexico, having been \$21,380,049 36, the aggregate expenditures for the seven succeeding years upon that basis would have amounted to.....149,660,345 52

Showing an excess over the peace establishment of 1845 of.....\$145,147,062 43

This excess of expenditures is to be accounted for as follows:

Actual and estimated expenditures of the war department for seven years subsequent to the declaration of the war with Mexico, are.....117,876,495 31

Under peace establishment of 1845, as before stated, they would have been.....35,643,748 54

Excess occasioned by said war.....\$82,232,745 71

Actual and estimated expenditures of the navy department amounting to.....62,659,331 74

would have been as per statement I.....43,600,473 63

Excess.....\$19,058,858 11

[See the statement L and accompanying papers from the bureaus of the war department, 1 a 7.]

Actual and estimated expenditures of the navy department, amount to.....62,659,331 74

would have been as per statement I.....43,600,473 63

Excess.....\$19,058,858 11

Installments and interest under 12th article of treaty with Mexico.....16,388,396 37

Payment of liquidated claims against Mexico, per act July 29, 1848.....2,089,578 64

Miscellaneous.....4,453,139 99

Amount to 1852, occasioned by the

war.....	124,252,719 08
And for objects not included in the sum as the expenditures for 1845, made in pursuance of the acts of the government during a period subsequent to 3d March, 1845, and prior to 4th March, 1849, including postoffice deficiencies and census, as follows. See statement O.	
Seventh census.....	1,276,000 00
Erection of patent office.....	600,000 00
Supplying deficiencies in postoffice department and for department mail matter.....	1,768,752 57
Expenses of collecting the revenue from customs, lands, etc., never exhibited in the expenditures prior to 30th June, 1849.....	6,813,557 95
Expenditures on account of Smithsonian Institute.....	412,134 70
Refunding duties, debentures, drawbacks, bounties, etc.....	2,923,168 36
Building revenue cutters, before paid out of the accruing revenue.....	101,999 50
To which the sum of.....	\$138,148,330 16
may be added for building light houses, beacons, buoys, etc.....	974,795 26
Custom houses, marine hospitals, and support thereof.....	1,288,741 87
Increase of expenditures in the legislative, executive and judiciary, departments, the sum of.....	4,205,751 50
And for miscellaneous items, not enumerated.....	569,443 24
	\$145,147,062 43
Sum as above to 30th June, 1852, chargeable to the war.....	124,252,719 08
And to which may be added interest on war debt to 30th June, 1852, statement P.....	13,387,544 06
Interest on war debt from 30th June, 1852, to maturity [P2].....	41,173,493 38
Public lands granted and to be granted [per table K] as estimated.....	17,346,750 00
Claims pending and estimated by third auditor [statement Q].....	765,069 37
Texas boundary stock to be issued.....	10,000,000 00
Interest on do. for 14 years at 5 per cent.....	7,000,000 00
Mexican claims per treaty, stock to be issued.....	3,250,000 00
We have thus, as expenditures and liabilities, chargeable directly to said war, and the acquisition of territory consequent upon the treaty of peace, the sum of.....	\$217,175,575 89
But this does not include many claims presented, and to be presented, arising indirectly from the war—their great variety forbidding even an approximation either as to number or amount.	
Statement R gives the annual expenditures from 1825 to 1841, ranging from \$12,530,846 43, in 1828, to \$25,745,776 28 in 1841, the average annual increase being \$943,923 56, exclusive of all expenses of the revenue, etc.	
The expenditures for the four succeeding years, from 1841 to 1845, are averaged in consequence of the change in the fiscal year, the average being.....	22,987,411 78
A diminution in the average, as compared with the four preceding years of.....	3,481,158 95
Amounting, in the aggregate, to.....	13,924,635 80
The estimated expenditures for the year ending 30th June, 1852, are.....	48,124,993 18
The expenditures under the peace establishment of 1845, exclusive of the public debt, were.....	21,380,049 36
Excess for the year ending June 30, 1852.....	\$26,744,943 82
By reference to statement (S. I. M. and O.) it will be seen that of these estimated expenditures for the year ending 30th June 1852, the excess over the expenditures of 1845, required by the War Department in consequence of the war and our	

new territories is.....	\$6,002,658 43
Navy department.....	3,936,736 00
Pension acts of 1848.....	840,000 00
Mexican instalment and interest.....	3,180,000 00
Survey of boundary line.....	100,000 00
Light-houses, dry docks, etc., in California.....	300,000 00
Territorial Governments, Utah, and New Mexico.....	70,200 00
Interest on public debt.....	3,665,321 03
Indians in new territories.....	130,800 00
Collections from the revenue from customs, bounties, etc. not included in 1845.....	3,484,774 04
Expenses, land sales, do. do.....	170,200 00
Patent office.....	850,000 00
Payment on account of the principal of the public debt.....	643,548 00
Survey on the coast of California.....	100,000 00
Smithsonian institute.....	30,910 14
Deficiencies in Post-office department.....	200,000 00

Entire expenses.....\$23,199,149 43

By deducting this aggregate of excess, \$23,193,148 64, from the aggregate estimated expenditures for the year ending 30th of June, 1852, of \$48,124,993 18, there will remain as the estimated ordinary expenditures the sum of \$24,925,844 54.

Thus it will be seen that of the aggregate expenditures, actual and estimated, for the seven years ending on the 7th June, 1852, amounting to \$294,807,407 95, the sum of \$138,148,330 18, exclusive of \$13,387,544 06 interest on war debt, is required to sustain the faith of the government, pledged or implied, or arising in consequence of its acts during a period subsequent to 30th June, 1850, and prior to 1st July, 1849.

To be continued.

Returns of New York Railroads.

HUDSON RIVER RAILROAD.

This road is in operation from New York to Poughkeepsie, distance 75 miles, which is more than half the distance to Albany. Since January last 40 miles of double track has been laid, extending from New York to Peekskill. Four new passenger houses have been erected, and increased wood and water accommodations provided, in view of the increased business of the road. A watchman is stationed at every curve and cross road, whose duty it is to be at his post whenever a train passes or is due and to make the prescribed signals to the Engineer indicating the state of the track. Each watchman closely inspects his portion of the track before the passage of each train, and in case of danger gives warning to the train in time to prevent injury.

That portion of the road between Poughkeepsie and Albany is under contract.	
Capital stock as by charter.....	\$4,000,000 00
Amount of stock subscribed.....	3,400,162 17
Amount paid in, as by last report.....	3,157,175 00
Total amount now paid in of capital stock.....	3,310,552 17
Total amount of funded debt.....	3,586,750 00
Amount of floating debt.....	111,151 37
Total amount of funded and floating debt.....	3,697,901 37
Average rate per annum of interest on funded debt 7 per cent:—	
Cost of gradation and masonry.....	3,127,630 03
" Bridges.....	121,259 73
" Superstructure including iron.....	1,336,445 51
" Buildings, engines, car-house, &c.....	349,804 99
" Land, land damages and fences.....	572,241 86
" Locomotive and fixtures.....	107,525 57
" Passenger and baggage cars.....	103,921 96
" Freight and other cars.....	103,921 26
" Engineering and agencies.....	289,064 05
Interest on stock and other items not enumerated.....	591,012 81

Total construction.....\$6,669,681 55

Length of road is 143 72-100 miles; constructed 74 1/100; length of double track 38; weight of rail 70 lbs per yard. The company own 4 engine houses and 1 shop; 44 passenger cars, first class; 12 baggage, mail and express cars; 75 freight, and 61 dirt do.

The business of the road for the 9 months ending

Sept. 30, are as follows:—Miles run by passenger trains 158,431; by freight 25,080; number of passengers carried, 509,180; freight carried, 5745 tons

Expense of maintaining road.....\$18,665 30

" repairs of machinery, &c.,..... 16,850 66

" operating the road..... 118,367 51

Total expenses.....	\$253,883 47
Earnings from passengers.....	\$242,595 10
" freight.....	18,575 56
" other sources.....	6,490 00

Total earnings.....	\$564,858 30
Transportation expenses.....	\$167,383 47

ALBANY AND SCHENECTADY RAILROAD.

Capital stock subscribed and paid in...\$1,000,000

Funded debt as by last report..... 552,000

Total amount of funded & floating debt 700,000

Average rate per annum of interest on funded debt..... 6 1/2 per ct.

Cost of road and equipment.....1,711,412 30

Length of road nearly 17 miles; double track 9 miles; weight of rail 60 lbs per yard. The company own 3 engine houses and shops, 7 engines, 36 first class passenger cars, 33 second class do., 45 mail and baggage, and 34 freight cars.

Miles run by the passenger trains 51,545; do. freight 32,248; freight carried over 63,012 tons; number of passengers carried over road 284,279

Expense of maintaining road.....\$19,000 10

" repairs of machinery, &c..... 5,924 87

" operating the road..... 66,247 01

Total expenses.....	\$91,171 98
Earnings from passengers.....	132,207 69
" freight.....	70,242 69
" rents and mail services.....	6,134 50

Total earnings.....\$208,584 88

The receipts are the same as the earnings.

Transportations including tolls paid	
State.....	\$91,171 88
Paid interest.....	38,808 67
" dividends.....	70,000 00
Surplus fund.....	8,604 23
Total amount of surplus and reserve.....	25,000 00

SCHENECTADY AND TROY RAILROAD.

Capital stock subscribed and paid.....\$650,000 00

Funded debt, as by last report..... 20,500 00

Total amount now, of funded debt..... 59,700 00

Floating debt, as per last report..... 16,295 69

Amount now, of floating debt..... 1,698 89

Total amount of funded and floating debt..... 61,398 89

Rate of interest upon funded debt 7 per ct.

Cost of road and equipment \$680,046 32.

Length of road 20 1/2 miles. The company own 3 engine houses and shops; 5 engines, 5 first class cars, 2 second do., 2 baggage and 28 freight cars. Miles run by trains 53,845; by freight 7,462. No. passengers carried in cars 56,812; freight carried 317,030 tons.

Expense of maintaining road.....\$14,822 06

" repairs of machinery..... 13,278 76

" operating the road, etc..... 19,919 62

Total expenses.....	\$58,020 44
Earnings from passengers.....	26,539 80
" freight.....	14,926 82
" other sources.....	879 00

Total earnings.....	\$42,345 69
Transportation expenses.....	60,267 71
Interest payments.....	2,381 11
No dividends.....	

HUDSON AND BERKSHIRE RAILROAD.

Capital stock, as per charter.....\$450,000 00

Amount of stock subscribed..... 380,000 00

Total amount paid in and assessments 425,000 00

Total funded debt..... 325,000 00

Amount of floating debt..... 47,149 92

Total amount of funded and floating debt..... 372,149 92

Rate of interest paid on debt 6 1/2 per ct.

Cost of road and equipment \$821,331 45

Length of road 31 1/4 miles. Weight of rail 56 lbs per yard. The company own 2 engine houses and shops, 4 engines, 4 first class cars, 2 baggage and 28 freight cars.

Miles run by passenger cars 38,896—by freight 17,680,	
No. of passengers carried 33,491, freight 23,809 tons.	
Expense of maintaining road.....	4,527 00
do. repairs of machinery.....	2,874 23
do. operating the road &c.....	19,948 60
Total expenses.....	27,349 88
Earnings from passengers.....	14,771 63
do. freight.....	25,269 28
do. sources.....	1,000 00
Total earnings.....	\$41,040 91
Receipts.....	40,540 91
Payment for transportation, etc.....	27,349 88
do. for interest.....	13,191 03
Total payments.....	\$40,540 91

OSWEGO AND SYRACUSE RAILROAD.

Amount of capital subscribed and paid in.....	\$350,000 00
Funded debt as by last report.....	182,000 00
Total amount now of funded debt.....	200,000 00
Floating debt, as per last report.....	22,906 07
Amount now of floating debt exclusive of current ex.....	10,463 47
Total amount of funded and floating debt.....	210,463 47
Av. rate of interest per annum on funded debt 7 per cent.	
Cost of road and equipment.....	571,774 21
Length of road 35 miles; weight of rails 57 lbs. per yard; company own 1 engine house, 4 engines, 5 first class cars, 2 mail and baggage and 28 freight cars.	
Miles run by passenger trains 58,480 miles, freight 16,000; 77,162 passengers and 7,949 tons freight carried.	
Expense of maintaining road.....	\$14,925 63
do. repairs of machinery.....	3,019 19
do. operating the road, etc.....	20,998 10
Total expenses.....	\$38,942 92
Earnings from passengers.....	57,118 33
do. freight.....	9,061 32
do. other sources.....	12,191 66
Total earnings.....	78,371 61
Receipts.....	78,082 85
Payments for transportation.....	38,942 92
do. do. interest on bonds.....	14,000 00
do. do. dividends declared.....	14,000 00
Total payments.....	\$66,942 92

CAYUGA AND SUSQUEHANNA RAILROAD.

Capital stock, as per charter.....	500,000 00
Amount of stock subscribed.....	168,000 00
do. paid in, as by last report.....	118,000 00
Total amount now paid in.....	168,000 00
Total amount now of funded debt.....	300,000 00
Floating debt as per last report.....	253,000 00
Amount now of floating debt.....	134,849 83
Total amount now of funded and floating debt.....	434,849 83
Interest paid on debt 7 per cent per annum.	
Cost of road and equipment.....	580,310 91
Length of road, 35 miles; weight of rail 58 lbs. per yard. The company own 1 engine house and shop, 3 engines; 4 passenger, 3 baggage and 45 freight cars. Miles run by cars, 52,756 miles; passengers carried, 25,653, freight, 8,886 tons.	
Expense of maintaining road.....	2,301 19
do. repairs of machinery.....	10,307 86
do. operating the road.....	31,956 91
Total expenses.....	44,565 96
Earnings from passengers.....	33,600 63
do. freight.....	10,417 22
do. other sources.....	4,207 25
Total earnings.....	48,225 10
Total receipts.....	45,018 97
Payments for transportation expenses.....	30,810 91
do. interest.....	15,486 74
Total payments.....	\$46,297 65

The above report embraces a period of 9 months and 11 days.

TROY AND GREENBUSH RAILROAD.

Capital stock as by charter.....	\$275,000 00
Total amount subscribed and paid in.....	274,400 00
Funded debt, as by last report.....	5,700 00
Total amount now of funded debt.....	4,550 00
Floating debt as per last report.....	5,133 72
Amount now of floating debt.....	4,100 12
Total amount now of funded and floating debt.....	8,650 72
Av. rate interest 7 per cent per annum.	
Cost of road and equipment.....	282,527 93
Road 6 miles in length: weight of rail 56 lbs. per yard. The company own 1 engine house and shop, 3 engines; 4 passenger and 2 baggage cars. Miles run by trains 47,792; number of passengers carried 237,796; freight 38,988 tons.	
Expense of maintaining road.....	\$8,723 62
do. repairs of machinery.....	5,784 73
do. operating the road.....	29,425 80
Total expenses.....	\$43,943 15
Earnings from passengers.....	\$34,904 46
do. freight.....	24,261 63
do. other sources.....	1,252 72
Total earnings.....	\$59,418 81
Receipts.....	56,654 98
Payments for transportation expenses.....	\$43,054 48
do. interest.....	383 45
do. dividends.....	8,232 00
Total payments.....	\$51,669 93

TONAWANDA RAILROAD.

Capital stock as by charter.....	\$1,000,000 00
Amount subscribed and paid in.....	1,000,000 00
Funded debt, as last report, and same now.....	159,500 00
Floating debt as per last report.....	43,653 48
Amount now of floating debt.....	7,348 67
Total amount now of funded and floating debt.....	166,848 67
Av. rate interest on funded debt 7 per cent. per annum.....	
Cost of road and equipment.....	1,216,820 91
Length of road 43½ miles; weight of rail, 64 lbs. per yard. The company own 3 engine houses and shops; 13 passenger and 90 freight cars. Miles run by passenger trains, 115,884 miles; number of passengers carried, 256,404, freight, 29,211 tons.	
Expense of maintaining road.....	\$34,691 56
do. repairs of machinery.....	24,212 31
do. operating the road.....	50,719 01
Total expenses.....	109,622 88
Earnings from passengers.....	255,252 80
do. freight.....	67,668 37
do. other sources.....	21,476 88
Total earnings.....	344,398 05
Total receipts.....	342,198 05
Payments for transportation expenses.....	89,623 23
do. interest.....	11,558 20
do. dividend.....	92,000 00
Total payments.....	193,180 47

WATERTOWN AND ROME RAILROAD.

Capital stock as by charter.....	\$1,500,000 00
Amount of stock subscribed.....	890,100 00
do. paid in, as by last report.....	237,829 46
Total amount now paid in.....	467,636 37
Total amount of funded debt.....	200,000 00
do. funded and floating debt.....	200,000 00
average rate of interest on debt 7 per cent.	
Cost of road and equipment.....	\$603,457 23
Length of road 97 miles. Weight of rail 56 lbs. per yard. The company own 1 engine, 3 passenger, 2 baggage and 13 freight cars. Miles run by passenger trains 1,440; passengers carried in cars, 2,601; freight carried 680 tons.	
Expense of maintaining road.....	\$430 17
do. operating the road, etc.....	274 44
Total expense.....	\$704 61
Earnings from passengers.....	1,043 23
do. freight.....	1,089 12
Total earnings.....	\$2,132 35
Total receipts.....	2,132 35
Payments for transportation expenses.....	262 89

SYRACUSE AND UTICA RAILROAD.

Capital stock as by charter.....	\$2,400,000 00
Amount subscribed and paid in.....	2,400,000 00
Funded debt as by last report.....	80,000 00
Total amount now of funded debt.....	48,000 09
No floating debt, average rate interest per ct.	
cost of road and equipment.....	2,490,083 99
Length of road 53 miles. Weight of rail on north track, 61 lbs. per yard, and south 70 do. The company own 5 engine houses and shops, 18 engines, 24 first class cars, and 101 freight do. Miles run by passenger trains, 149,950, by freight, 116,479. Number of passengers carried 340,945.	
Expense of maintaining road.....	62,858 10
do. repairs of machinery.....	50,000 58
do. operating the road, etc.,	87,869 46
Total expenses.....	200,728 14
Earnings from passengers.....	367,077 07
do. do. from freight.....	90,878 97
do. do. from other sources.....	15,819 73
Total earnings.....	473,775 77
Receipts.....	471,436 12
Payments for transportation.....	202,728 14
do. do. interest.....	9,931 30
do. do. dividends.....	190,280 00
Total payments.....	402,939 44

AUBURN AND ROCHESTER RAILROAD.

Capital stock as by charter.....	\$3,000,000 00
Amount of stock subscribed.....	2,196,765
do. paid in as by last report.....	2,151,765
Total amount of capital now paid in.....	2,196,765
Funded debt as by last report.....	638,000
Total amount now of funded debt.....	595,000
Floating debt as per last report.....	60,000
Amount now of floating debt.....	30,000
Total amount of funded & floating debt.....	625,000
Av. rate of int. on funded debt 6½ pr. an.	
Cost of road and equipment.....	3,000,000
Length of road 78 miles. Weight of rail 67 lbs. per yard. The company own 3 shops; 1½ engine houses; 19 engines, 20 passenger and 100 freight cars. Miles run by passenger cars 199,550; passengers carried 271,303, freight 134,145 tons.	
Expense of maintaining road.....	\$42,706 72
do. repairs of machinery.....	47,984 52
do. operating the road, etc.....	47,984 52
Total expenses.....	163,465 64
Earnings from passengers.....	386,616 13
do. freight.....	111,998 49
do. other sources.....	17,196 63
Total earnings.....	515,810 94
Total receipts.....	515,810 94
Payments for transportation expenses.....	163,465 64
do. interest.....	46,947 33
do. on dividends.....	260,851 80
do. to surplus fund.....	44,546 12
Total amount of surplus fund.....	193,085 90
Total payment, &c.....	\$708,896 84

ROCHESTER & SYRACUSE RAILROAD.

Capital stock, as by charter and articles of association.....	\$4,200,000 00
Amount of stock subscribed.....	3,364,979 75
Total amt. now paid in of capital stock.....	3,364,979 75
do. do. of funded debt.....	916,000 00
do. do. do. and floating debt.....	916,000 00
Av. rate of interest on funded debt, 6 per ct.	
Cost of road and equipments.....	4,200,000 00
Length of road 104 miles. Weight of rail 65½ lbs. per yard. The company own 25 engines, 34 passenger, and 136 freight cars; miles run by passenger trains, 55,952; passengers carried, 93,561, freight 9,604 tons.	
Expense of maintaining road.....	16,247 68
do. repairs of machinery.....	20,400 34
do. operating the road, etc.....	24,128 56
Entire expenses.....	60,876 58
Earnings from passengers.....	176,991 47
do. do. freight.....	24,444 74
Entire earnings and receipts.....	201,436 21
Payments for transportation expenses.....	60,876 58

ALBANY AND WEST STOCKBRIDGE RAILROAD.

Capital stock subscribed and paid in \$1,000,000 00
 Floating and funded debt..... 930,895 01
 Cost of road and equipment..... 1,930,895 01
 Length of road 38½ miles. The company have leased the road to the Western Railroad Corporation, the expense for the repairs of machinery and running the road are paid by the Lessees.

ATTICA AND BUFFALO RAILROAD.

Capital stk. as by charter, & paid in \$800,000 00
 Floating debt as per last report.... 67,176 43
 Total amount now of funded and floating debt..... 42,676 43
 Cost of road and equipment..... 906,915 16
 Length of road 31½ miles. Weight of rail 62 lbs per yard; the company own two engine houses and one shop; one passenger and one freight depot 6 engines, 8 passenger and 43 freight cars. Miles run by passenger trains 78,978; passengers carried 236,473, freight 24,183 tons.
 Expenses of maintaining road..... \$13,388 74
 " repairs of machinery..... 11,954 18
 " operating the road..... 45,556 52
 Entire expenses..... \$70,909 13
 Earnings from passengers..... \$185,744 69
 " freight..... 37,765 35
 " other sources..... 6,200 00
 Entire earnings..... \$229,710 04
 Receipts from passengers..... 185,744 69
 " freight..... 37,765 35
 " other resources..... 20,992 34
 Entire receipts..... \$244,502 38
 Payment for transportation expenses not given.
 " interest including interest on new stock as paid in until full..... \$14,330 61
 " dividends on \$800,000 capital stk. at 10 per cent.. 72,170 00
 Entire payments..... \$86,500 61
 There are a number of reports not yet in. As soon as received we will complete the list.

Bridging of Rouse's Point.

The Vermont Legislature, at its late session, passed an act authorizing the Vermont and Canada Railroad Company to construct a bridge over the lake at Rouse's Point.

The following are the main provisions of the bill:

Sec. 1. Authorizes the company to build a draw-bridge on the Vermont side of the lake, but provides that the act shall not take effect until the New York Legislature authorize the bridging of the New York side.

Sec. 2. Provides that the bridge shall be at least forty feet wide, and shall be so built as to leave not less than three thousand feet of water way on the surface, with a draw of at least seventy feet wide in the clear, and also designates how the same shall be tended. No vessel to be detained for the passage of the cars over thirty minutes.

Sec. 3. Timothy Follet and Charles Paine are appointed Commissioners to determine the mode of construction of the draw.

Sec. 4. The company to appoint a competent person to superintend the draw, who may be removed for incompetency and a suitable person in his stead appointed by the Governor.

Sec. 5. The company made liable for any damage to or unreasonable hindrance or delay of vessels, and the master or owner of vessels made liable to the company for any unwarrantable hindrance to the passage of the cars over the bridge.

Sec. 6. This act may be altered, amended or repealed at any time by the Legislature.

Sec. 7. All railroads now or hereafter chartered by the State of Vermont, may use the road and bridge from Swanton to the Vermont line, subject to such rules, regulations, rates of toll and compensation as shall be just and reasonable.

Sec. 8. The Rutland and Burlington road may be extended within three years, via Mallet's Bay or near Manley's Falls, and intersect the Vermont and Canada road in Swanton.

Sec. 9. Provides for laying a double track from Swanton to the bridge, for the convenience and benefit of both companies.

Sec. 10. If the companies cannot agree, commissioners to regulate the rules, rates of toll or compensation for using the road.

Sec. 11. All railroad companies which may be chartered to connect with the Vermont and Canada road at Swanton, may use that portion of the road under just and reasonable regulations and rates of toll, etc.

Sec. 12. The Vermont and Canada road to pay all damages occasioned to land and property by reason of the construction of the bridge.

These are the most important provisions of the bill, and which the friends of the Central road would make us believe very unacceptable to them.

A meeting of stockholders is to be held at Northfield, Vt. on the 26th day of December, at which this act is to be taken "into consideration."

Banks in the United States.

The following aggregate statements are derived from the report of the Secretary of the Treasury; The whole number of Banks and Branches in operation in the Union at the commencement of the present year was 824. Total capital paid in, \$217,317,211.

RESOURCES.

Loans and discounts.....	\$364,204,078
Stocks.....	20,606,759
Real Estate.....	20,582,160
Other investments.....	11,949,568
Due by other banks.....	40,631,853
Notes of other Banks.....	16,303,245
Specie Funds.....	11,603,289
Specie.....	45,379,345

LIABILITIES.

Circulation.....	\$121,366,520
Deposits.....	109,586,585
Due other Banks.....	36,717,450
Other liabilities.....	8,635,309

The circulation and deposits.....	\$240,953,121
Aggregate immediate means.....	114,917,234
The Eastern States have Banks.....	297
Middle States.....	293
Southern States.....	87
South Western States.....	73
Western States.....	74

The eastern states have \$61,822,154 capital—the Middle \$75,933,881—the Southern \$38,873,251—the South Western \$31,923,250, and the Western \$9,604,667.

The "Loans and Discounts" in the Eastern section \$98,310,000—in the middle States \$149,789,000 in the Southern \$50,866,000—in the South Western \$44,630,000 and in the Western, \$20,587,000.

The circulation and deposits in the several sections are as follow:

	Circulation.	Deposits.
Eastern.....	\$29,000,000.....	\$14,923,000
Middle.....	41,862,000.....	64,764,000
Southern.....	25,220,000.....	9,678,000
South Western.....	20,819,000.....	16,334,900
Western.....	14,635,000.....	5,586,000

There are no banks incorporated in Florida, Texas, Arkansas, Illinois, Wisconsin, Iowa, Minnesota, Oregon, California, District of Columbia.

North Carolina.

Wilmington and Manchester Railroad.—Gen. Harlee's address to the members of the Legislature and others, in the Commons Hall, on Saturday evening, in favor of the Wilmington and Manchester railroad, of which he is President, gave universal satisfaction. He earnestly insisted that all that section of South Carolina which he represented, desired, was an outlet for the products of their land now tied up at home, for the want of the of transportation to market, and that end gained, there was no doubt, but that N Carolina would reap all the advantages which must necessarily accrue from having so heavy an amount of foreign and domestic produce poured into the port of Wilmington, over and above its present trade. Gen. H. showed conclusively, that while this road could not, by any possibility, inflict any injury upon us, it must necessarily be productive of much benefit, by enhancing the value of State works, already, built and in progress, and also by the increased value, both in

price and productiveness, of the lands in the counties through which it will pass, on this side the line. His remarks were all based upon calculations, made apparently with great care and accuracy, and in the impressive language of figures, appealed strongly and convincingly to the minds of his audience. Gen H. presented it farther as a Southern measure, touching lightly but impressively upon the point, that, however, measures might hereafter eventuate, it behooved us all as bound by one common tie, one distinctive interest, to see that we were in a position to command our entire resources.—*Rail. Register.*

SURVEY OF THE MISSISSIPPI.

A party of civil engineers who have lately been engaged in an examination of all the passes and outlets of the Mississippi into the Gulf, report as their opinion that there is no doubt of the practicability of closing in a short time, and at comparatively small expense, a number of the passes, so as to throw the volume of water into a few of the principal outlets, deepening them and affording greater facilities for carrying off the superabundance of water at New Orleans. The northeast passes are gradually shallowing, while the southeastern continues at a convenient depth for large vessels, and will probably increase in depth. Some definite information will be gained from these surveys concerning the changes which have taken and are continually taking place in the outlets of the Mississippi; from which the extent and nature of future changes may be judged of.—*National Intelligencer.*

STATISTICS OF THE LATE CENSUS OF MASSACHUSETTS.

The statistics of the census recently taken in Massachusetts exhibit many most extraordinary facts. Since 1850, at least 600 miles of railway have been finished in the state, and many lines of stages displaced, but the horses in Massachusetts have increased from 60,030 in 1840, to 74,060 in 1850. In the same period, cattle have increased from 278,737 to 299,600, while sheep have declined from 343,300 to 179,537. The produce of wheat has declined from 191,178 bushels to 28,487, and Indian corn increased from 1,775,073 bushels to 2,295,856; cotton and woolen spindles have doubled in number, and distilleries have decreased from 78 to 42.

Statistics of Massachusetts—1840 and 1850.

	1840.	1850.
Number of houses.....	96,550	134,041
" barns.....	63,806	74,765
Superficial feet of wharf.....	3,402,886	14,831,359
Number of cotton spindles.....	624,540	1,220,752
" woolen.....	113,457	208,884
" Bleacheries.....	10	23
" paper mills.....	98	114
" tons of shipping.....	498,057	628,770

The following comparative account of the cotton and woolen manufactories will be found interesting:—

Cotton Factories.

	Mills.	Spindles.	Looms.
1840.....	313	624,540	16,638
1850.....	337	1,220,752	32,539

Woolen Factories.

	Mills.	Spindles.	Looms.
1840.....	301	113,457	3,032
1850.....	191	208,884	4,943

Of silk and calico printing establishments, in 1840, there were 12; in 1850, 18. In 1850, there were 232,964 rateable polls; 134,041 dwelling houses; 25,684 workshops; 19 breweries; 388 tanning houses; 5,312 warehouses and stores; 71 rope walks; 718 grist mills; 330 carding mills; 95 fulling mills; 1,605 saw mills; 16 small arm manufactories; 837 sitting mills and nail machines; 9 linen factories, with 3,984 spindles and 81 looms; 114 paper mills; 423 mills of other kinds; 204 iron works and turnaces; 68 oil factories; 8 glass factories; 47 card factories; 5,338,587 superficial feet of salt works; 14,834,350 do. of wharfing; 628,770 tons of vessels; 300,000 acres tillage land; 1,311,220 acres pasture; 715,000 acres unimproved land; 257,000 acres unimprovable land; 98,539

acres land used for roads; 169,117 acres land covered with water. Since 1840, the increase of railways, in miles, has been nearly 600 per cent.

Internal Improvements of the State of New York.

A SKETCH OF THE RISE, PROGRESS, AND PRESENT CONDITION OF INTERNAL IMPROVEMENTS IN THE STATE OF NEW YORK.

Continued from page 770.

Although Mr. Wright reported against commencing the canal as a state work, he reported a bill for incorporating "the president and managers of the Tonawanda Canal Company," in compliance with the second branch of the petition for the accomplishment of the same work. After referring to the energy of the Delaware and Hudson Canal Company, the report states that "the committee feel anxious that the experiment should be further tried, and that all these improvements, within the reach of individual or corporate enterprise, should be turned into those channels, rather than be made a state system, already complicated and expensive."

At the same session the Delaware and Hudson Canal Company applied to the Legislature for aid, either by a subscription of half a million of stock, or a loan to that amount or an increase of the banking capital of the company. Their memorial was referred to the canal committee, and on the first of February Mr. Wright reported in favor of loaning the credit of the state to the company for \$500,000. This company was incorporated in 1823, and in 1824 obtained the privilege of using \$500,000 in banking, conditioned that the company should expend \$150,000 annually on the canal between the Delaware and Hudson until the same was completed. This work was commenced in the summer of 1825, and at the time of making application to the Legislature for a loan in 1827, the company had expended in canal operations, coal mines, &c., \$869,500; having completed the canal between the Hudson and Delaware rivers, a distance of 59 miles.

The committee, consisting of Mr. Wright, C. D. Colden, and Jacob Haight, were unanimously of opinion, that "the vigor and energy with which the company have prosecuted their canal, the great expense they have already voluntarily sustained, and the important public character of that work, in supplying the state, and particularly the large cities on the Hudson, with fuel, entitle them to the most favorable attention of the Legislature." The committee then recommend a loan to the company of \$500,000 of stock, on condition that the company execute to the state a mortgage on their canal made and to be made, on their coal mines, and all the property to be purchased by the company in connection with the canal, to secure the punctual payment of interest on the stock, and its reimbursement at the end of twenty years. It was also provided that only \$100,000 should be delivered at a time, to be expended on the work and accounted for before another hundred thousand could be obtained. And the report adds:—"This arrangement the committee do believe must render the state secure against any contingency, while it holds out to the company the most direct and positive inducements to persevere in the completion of their laudable design, with the same good faith and vigilance which has hitherto so strongly marked their proceedings."

The committee also reported in favor of exempting the canal from taxation, until the income of the bank, canal, and other property, taken together, should produce to the company a profit of 6 per cent on their whole capital. This exemption not to extend beyond the period of six years. The bill passed the Senate, 24 to 1, and the Assembly, 90 to 8. In the Assembly an amendment was made to the bill, requiring the stock loaned to the company to be sold at auction, and the premium obtained thereon to be paid into the Treasury for the use of the school fund. The sum realized by the school fund from this source was \$46,205.

Mr. Clinton, in his annual message in 1828, evidently referring to Mr. Wright's report of the preceding session, remarks as follows:—"Considering the high reputation and the great revenue which this state has derived from her internal improvements, it is equally astonishing and mortifying to observe elaborate and systematic attempts to de-

preciate their utility and arrest their progress. It is manifestly an uncandid and superficial view of the subject to confine an estimate of its benefits to an excess of income above the interest of expenditure. Artificial navigation was established for the public accommodation, for the conveyance of articles to and from market, and revenue is a subordinate object." And he renews his recommendations for internal improvements made at the previous sessions, adding, that "the means of the state are ample—her resources great—her credit equal to any emergency."

Laws were passed at this session to connect the Cayuga and Seneca Canal with Cayuga Lake, which had not been provided for in the original law for the construction of said canal. Also, to loan the credit of the state for ten thousand dollars to the Neversink Navigation Company in the county of Sullivan. This petition was referred to the canal committee of the Assembly, of which Mr. Granger was chairman, and a favorable report from him, aided by the precedent established by Mr. Wright's report for a loan to the Delaware and Hudson Canal Company, secured the passage of the bill, although the company had nothing of value to mortgage. The president of the company paid the interest on the loan for two or three years, and from that time the state had to assume the payment of the loan. The value of all the property mortgaged was insufficient to pay the expenses of foreclosure.

Although petitions were presented for the construction of more than twenty canals, no laws were passed for any of them at this session. Surveys were authorized in a few cases.

Mr. Wright resigned his seat in the Senate on the 4th of March, 1827, and Mr. Clinton died on the 11th of February, 1828.

Mr. Van Buren was chosen Governor in November, 1828, and in his message in January following he recommended the application of the Delaware and Hudson Canal Company for a second loan, to the favorable consideration of the Legislature. The memorial was referred to a select committee of the Assembly, of which Mr. Bradish was chairman, who gave a full history of the operations of the company to that period, showing that the security of the state would be ample, and recommended a second loan. The bill for loaning \$300,000 of 4 per cent stock passed the Assembly by a vote of 49 to 42, and the Senate by a vote of 15 to 8.

The report of the canal commissioners announced the completion of the Oswego Canal, 38 miles in length, one half being slack water navigation and the other half locks and short canals; it had eight dams across the Oswego river, thirteen locks of stone masonry, and one of stone and timber, having an aggregate lift of 123 feet, which is the difference in elevation between the marsh land at Salina and the surface of the water of Lake Ontario. They also stated that the Cayuga and Seneca Canal was nearly completed, 20 miles and 66 chains in length, about one-half canal and the other half slack water, with 11 wooden locks, embracing 734 feet of lockage. This canal cost \$236,804 74, including \$33,867 18, paid to the Seneca Lock Navigation Company.

In 1829, Thomas G. Waterman was chairman of the canal committee of the Senate, and Benjamin P. Johnson of the Assembly, and acts were passed for the construction of the Chemung Canal, from the head of Seneca Lake to the Chemung river, at Elmira, and another for uniting the Crooked and Seneca Lakes—on condition that responsible persons would contract to build the former for \$300,000, and the latter for \$130,000. These canals were constructed for these prices with wooden locks. Many of those on the Chemung Canal were so slightly built as to be destroyed by a flood a few years after, and in about ten years all the locks were rebuilt and other improvements made, which cost about as much as the original construction of the canal.

At the same session an act passed for the construction of the Chenango Canal, provided that the canal commissioners were satisfied that there would be an adequate supply of water at the summit level—that the work could be done for \$1,000,000, and that it would produce, in connection with increased revenues on the Erie Canal, for the first ten years after its construction, sufficient to pay for repairs and the interest on the cost of its construc-

tion. D. S. Bates estimated the cost of the canal at \$993,307 99, terminating at Utica. The canal commissioners, in their annual report of 1830, reported very fully in regard to all the points submitted to them, and came to the conclusion, that the canal would cost more than \$1,000,000—that reservoirs would be required to supply the summit level—and that the tolls, with the increase on the Erie Canal, would not be sufficient to pay interest on the cost and keep the canal in repair. The positions of the commissioners have been fully sustained by actual results. The canal was constructed under a law of 1833, and cost \$2,417,000, and in thirteen years the sums expended for repairs alone have exceeded the tolls on the canal by the sum of \$33,743, besides a million and a quarter of dollars paid for interest on the debt, and six reservoirs were constructed for supplying the summit with water, covering an area of 1,000 acres.

Resolutions were also passed in 1829, for the survey of three canal routes from the Erie Canal to the Alleghany river—for the Black River Canal—for a navigable communication from Otsego Lake, through the valleys of the Susquehanna and Chemung rivers to the Chimney Narrows in Steuben—and for connecting Otsego Lake, by a canal or railroad, with the Erie Canal.

At this session of the Legislature, Silas Wright, Jr., was chosen Comptroller, and Greene C. Bronson, Attorney General, which made them, ex-officio, commissioners of the canal fund, and members of the canal board. Mr. Wright, being called on by the Senate for his opinion as to the necessity of levying a direct tax, reported in favor of a tax, but no law was passed for carrying the recommendation into effect.

In his annual message in 1830, Governor Throop gave a full statement of the condition of the finances, showing that the capital of the general fund in 1826, was \$2,637,936; that in 1827 \$150,000 had been taken from it and given to the literature fund, and \$133,616 to the common school fund, and that these appropriations, and the sums used for the support of the government, had reduced the capital of the general fund to the sum of \$1,309,267. And he added:—"If taxation is delayed a few years, the general fund will be entirely exhausted, and it will be necessary then to provide by tax for the whole amount of the annual expenditures."

Mr. Wright in his annual report recommended a tax, and urged it as necessary to meet the claims on the Treasury, "without incurring a public debt for that purpose." Mr. Todd, chairman of the finance committee of the Senate, reported in favor of levying a tax of one mill on the dollar of valuation. A bill for this purpose passed the Senate, 16 to 6; but was defeated in the Assembly by a vote of 58 to 52.

Notwithstanding these full and frank expositions, and the fact that the expenditures of 1829, for the ordinary support of government, exceeded the resources by \$173,000, the Legislature, instead of passing an act for a tax, passed one declaring that all deficiencies in the revenues of the Oswego and Cayuga and Seneca Canals, to keep them in repair and pay the interest on their cost, should be paid from the general fund, which was thus crippled and exhausted. Acts were passed to survey the Black river and Genesee Valley Canals, and provision was made to pay the expense from the general fund.

Those immediately interested in the Oswego Canal contended that the language of the 10th section of the Constitution, viz:—"All parts of the navigable communications between the great western and northern lakes and the Atlantic Ocean, which now are, or hereafter shall be made and completed," included said canal, and that its maintenance might be paid for out of the canal fund. In the annual report of the com's. of the canal fund, in 1830, written by Mr. Wright, this subject was fully discussed, and resulted in the exclusion of the Oswego Canal from the "navigable communications" contemplated by the Constitution, as had previously been done by Governor Marcy, in the annual report of 1826. Both reports, however, concurred in the opinion that loans made for the construction of the Oswego and other canals, might be charged on the canal fund of 1817, after the period fixed for the payment of the original canal debt. Colonel Young dissented from the report made by his associates in relation to the Chemung and Crooked Lake Ca-

nals, and, in 1830, made a strong report to the Assembly [Dec. 195] against both projects.

In the annual message of Governor Throop, in 1831, he urged the Legislature, before commencing any new work of internal improvement, to be satisfied that "it will contribute in tolls sufficient to pay for necessary repairs, the interest of the debt to be created on its account, and, within a reasonable time, the principal. If it will not do this, then your duty requires you to determine whether the people will consent to be taxed to make up the deficiency of its revenue, and if so, to impose such tax contemporaneously with the act authorizing its construction."

Nathaniel P. Tallmadge was chairman of the canal committee of the Senate, and made a report on the Chenango Canal of forty pages, reviewing the financial condition of the state, and the history of the canal policy, and coming to a conclusion adverse to the canal.

Dudley Selden was chairman of the committee "on Ways and Means" of the Assembly,* and made a full report of the finances generally, and recommended several changes in relation to the mode of issuing and transferring canal stock, and recommended a mill tax. These recommendations, except the tax, are embodied in chapter 320 of the laws of 1831. An act passed at this session, incorporating a company to build a canal from the Erie Canal to the head of ship navigation in the Genesee river, and another to construct a canal from Ogdensburgh to Black Lake; and to extend the time for completing the Harlem Canal.

The tolls of the Erie and Champlain Canals are given, in the report of the fund commissioners, at \$1,005,392 32; expenses and interest, \$616,668 96. Surplus, \$388,723 36. This was for the fiscal year.

In order to provide for the deficiencies in the revenues of the Oswego and Cayuga and Seneca Canals, Mr. Maynard, of the Senate, from Oneida, prepared a bill to divert the interest obtained by investments of the canal fund from the objects for which the principal was pledged by the Constitution, and to apply this interest to the payment of deficiencies in the revenues of the canals before named. This bill did not become a law.

In 1832, Governor Throop recommended a direct tax, and the establishment of a fund "to be sacredly devoted to the purposes of internal improvements." He spoke of railroads as of modern invention, and said, "there is reason to believe that for great thoroughfares they will not only supersede every other kind of road, but enter into a successful competition with canals."

At this session, the Legislature passed acts of incorporation for twenty-seven railroads, eight of which only have been constructed, and commenced, viz: the New York and Erie, Rensselaer and Saratoga, Hudson and Berkshire, Tonawanda, Lake Champlain and Ogdensburgh, Auburn and Syracuse, Watertown and Rome, Ithaca and Owego. Acts of incorporation were also passed for constructing the Oneida Lake Canal, the Auburn and Owasco Canal, and the Black River Canal, the latter in six separate sections. The Chenango Canal passed the Senate by a vote of 16 to 13, but was rejected in the Assembly, 64 to 56. The report in its favor was made in the Senate by John F. Hubbard, of Chenango, although Judge Edmonds was chairman of the canal committee.—*Merchant's Magazine*.

Georgia.

Central Railroad and Banking Company.

The annual report of this company for the year ending Dec. 1, 1850, has been received, from which it appears that the whole cash receipts during the year from road and bank have been—

From road earnings prior to 1st Dec., 1839.....	\$92,037 45
From road earnings since that date.....	633,162 43
	725,199 88
From earnings of bank.....	28,183 40

Making total cash receipts.....\$753,383 28

* The Senate of New York has a Committee "on Finance;" the Assembly, "on Ways and Means."

And the same have been paid and disposed of as follows, viz:

Road expenses.....	\$362,889 69
Interest on bonds, 7 per cent.....	24,039 50
Interest on bonds, 8 per cent.....	3 20
Bank expenses.....	18,666 34
June and December dividends, (rate 8 per cent).....	232,945 50—\$637,647 23

Leaving a surplus of.....\$115,536 05 which has been added to the reserved fund, making that fund at this date.....\$186,880 73

The following statement shows the present financial condition of the company:

Resources and Property.

Railroad and appurtenances.....	2,996,117 86
Notes and bills discounted and bills receivable.....	338,854 55
Due by other banks.....	141,441 02
Due by agents and other cos.....	54,489 60
Stock in other companies.....	295,500 00
Banking houses and other real estate.....	18,812 72
George J. Bulloch, late Cashier.....	107,587 22
Protests.....	9 82
Specie and notes of other banks.....	94,882 50
	\$4,047,695 2p

Liabilities.

Capital stock paid in.....	2,968,917 50
Unpaid instalments.....	1,182 50
Bonds due by the company, 7 per cent.....	357,787 00
Bank notes in circulation.....	242,546 00
Suspense account.....	3,500 00
Due other banks and cos.....	89,618 66
Unclaimed dividends.....	19,131 36
Individual deposits.....	59,923 04
Dividends declared this day.....	118,208 50
Balance, being reserved fund.....	186,880 73
	\$4,047,695 29

The following table will show a comparison of the various branches of business for the year just closed, with the previous one:

	1849.	1850.
Up freight, through.....	167,721 49	204,947 89
" way.....	39,774 37	55,160 75
Down Fr't. through.....	304,572 86	252,154 57
" way.....	66,003 32	70,577 95
Up pas'ge. through.....	22,345 66	28,936 44
" way.....	13,753 28	18,131 29
Down pas. through.....	21,611 18	22,225 34
" way.....	12,851 75	16,911 18
U. S. Mail.....	19,750 00	19,200 00

Total earnings.....	\$668,383 91	\$688,245 41
Bales cotton, through.....	164,334	136,050
" way.....	39,391	39,981
Total bales cotton.....	203,725	176,031

Whole number of passengers transported over the road the past year is 22,216.

The current expenses of the road during the year, are exhibited under their appropriate heads, as follows:

Maintenance of way.....	\$121,246 54
" machinery and motive power.....	115,721 72
" cars.....	29,583 12
Transportation expenses.....	92,909 17
Incidental expenses.....	3,429 14
Total.....	\$362,889 69

In speaking of the condition of the road the superintendent says:

"There have been relaid about sixty miles of the new iron during the past year, this, with seventeen miles that was laid on the 1st Dec., 1849, makes seventy-seven miles that is now relaid—and leaves about fifteen miles of the iron, first ordered, yet to be laid. In addition to this, we have now arriving one thousand tons of T rail weighing

about fifty-two and a half pounds to the yard, which will enable us to take up the balance of our plate rail, and a few miles of the old T rail above No. 10, which is now beginning to give out; all of which we expect to put down the ensuing year.

I would recommend the purchase of about ten miles of rail annually, until the whole road, above No. 10, is renewed. This, I think, will keep pace with the deterioration, and can be put down to a much better advantage than a larger quantity.

Within the past year the company have purchased six engines. One freight engine and two passenger engines are from the Boston Locomotive Works; one passenger engine from the works of Messrs. Rogers, Ketchum & Grosvenor; one freight engine from Mr. M. W. Baldwin, and one from the Messrs. Norris, Philadelphia. All of which are now on the road, and performing their duty to my entire satisfaction.

The number and character of cars the company have at the present time, are as follows:

Eight wheel passenger cars.....	7
" baggage cars.....	3
Four " cars.....	3
Eight " box freight cars.....	127
" open freight cars.....	130
Four " gravel cars.....	15
Total.....	285

This company have been able to present the above favorable exhibit of its affairs, and to declare a dividend of 8 per cent from its net earnings for the past year, besides carrying a handsome sum to the reserve fund. There are but very few roads in this country that have been able to do this, and at the same time promise, with reasonable certainty, to continue to pay the same rate. This company has every prospect of a larger increase of business from the completion of various lines now in progress which are to connect with it. Of these are the Milledgeville and Gordon, the Milledgeville and Eatonton, the South Western, the Muscogee and the Waynesboro' railroads. In addition to these, the above company will sensibly feel the influence of the lines in progress in Alabama and Tennessee, which, to a certain extent, must use the Georgia railroad as their trunk line to the seacoast. The completion of the lines in progress in Alabama and Tennessee to the Mississippi and Ohio, must add vastly to the business of the Central road, and the value of its stock, which now sells quickly at par.

The people of Georgia have displayed great energy, forecast and ability in the construction of their magnificent lines of railroad, and they are now reaping the rewards of their exertions in liberal returns from their revenues in the increased value of their property, in the additional facilities given to business, and in the rapid increase of population. Georgia bids fair to be the second southern State in the Union, in point of population, by the present census. The above railroad, in connection with the railroads terminating at Macon, have submitted a proposition to that city, for the purpose of forming a connection, a matter of great importance to all of them. No decision has been made upon this proposition, but the above report expresses a hope that it will be accepted.

Pennsylvania.

Lebanon Valley Railroad.—We learn that the sum necessary to secure the charter for a company to construct a railroad between Harrisburg and Reading, through the Lebanon Valley, has been subscribed, and that a company will be immediate-

ly organized for this purpose. The route has been surveyed by skilful engineers, and the face of the country has been found favorable for the construction of a road with low grades and but few curves. This road is intended to connect the Reading with the Pennsylvania railroad at its commencement at Harrisburg, the distance from this city to Harrisburg being about 110 miles. The project is in the hands of enterprising parties, possessing practical experience and the confidence of the community, which will enable them to complete the work.—*Phil. Commercial List.*

AMERICAN RAILROAD JOURNAL.

Saturday, December 21, 1850.

Railroad Letting in Ohio.

Bellefontaine and Indiana Railroad.

SEALED PROPOSALS will be received at *Jacksonville*, Darke county, Ohio, (known also as Versailles), until January 21st, 1851, for doing the Grubbing, Clearing and Grading on 25 miles from Loramie Creek to the junction with the "Indianaapolis and Bellefontaine Railroad" at the Indiana State Line. Profiles are now ready at the Engineer's Office in *SIDNEY*, Shelby county, Ohio, where information can be obtained from *Israel Pemberton*, Resident Engineer. Proposals may also be left at *Sidney* till the 20th of January.

SEALED PROPOSALS will also be received at *Marion*, Ohio, until February 5th, 1851, for doing the Grubbing, Clearing and Grading on about 40 miles between Marion and Bellefontaine. The work, and profiles on this division, will be ready ten days before the letting. Information can be obtained from *Alexander Worrall*, Resident Engineer, at Bellefontaine, and at the Chief Engineer's Office in Marion.

The above are the only portions on the route not yet under contract. This road is known as the "third link" in the "great central backbone chain" from Philadelphia to St. Louis, and likewise as the western continuation of the main lines from Boston and New York, through Cleveland.

By order of the Board of Directors.

W. MILNOR ROBERTS,
Chief Engineer.

Engineer's Office, Marion, Ohio,
December 10, 1850.

Jones' Empire Ink.

THE following are the net prices for the trade—and cheapest:

Quarts, per dozen,	\$1 50	6 oz. per dozen,	\$0 50
Pints, " "	1 00	4 " " "	0 37½
8 ounces, " "	0 63	2 " " "	0 25

This is the best article of the kind manufactured—it is black when first used—and although very free flowing, is a first rate copying ink.

All orders promptly attended to, directed to the
EXCELSIOR AGENCY, 85 Nassau st.

Tubes. Tubes. Tubes.

THE Undersigned have received special permission from, and are in direct communication with, **THE BIRMINGHAM LAP WELDED IRON TUBE COMPANY**, for the sale of their very excellent and superior Boiler and Gas Tubes in large or small quantities. These Tubes are used very extensively both in England and the continent of Europe, and sold exclusively by

WILLIAM BIRD & CO.,
Iron and Tin Plate Merchants,
44 Wall st., New York.
5 Martin's Lane, City, London.
and 140 Buchanan st., Glasgow.

December 13, 1850.

Report of the Secretary of the Treasury.

We give this week a portion of the report of the Secretary of the Treasury, which we shall complete in our next number. It embraces a vast amount of useful statistical information, and is far in advance of the usual documents which proceed from this department. We shall give every material portion of it, and our readers will find it well worth preservation for future reference.

Maine.

Penobscot and Kennebec Railroad.—We see by the Maine papers, that the directors of the Penobscot and Kennebec railroad company hold a meeting at Waterville on the 27th inst., for the purpose of acting upon the question of the location of their road.

The question is one of great importance to Maine, and from the various indications which we notice, we should judge that it is felt that the decision of the directors is likely to have an important influence upon all the railways in the British Provinces and Maine. This will be readily perceived by any one, who fully understands the precise condition of the railway enterprises at the east. In fact, we regard the Penobscot and Kennebec railway as occupying one of the most important routes in New England. A few words in the way of explanation will make our views understood.

Maine started off with great boldness in 1844 in a project to extend a line of railway to Montreal, from the Atlantic seaboard at Portland, a distance of some 275 miles, and has pressed forward in this work, till its completion in 1852 is now made a matter of certainty. The Canadians on the one side and the people of Maine on the other, entering heartily into each other's views, and each contributing the means to construct their respective portions of the line.

The line has been located with a view to the shortest practicable route from the St. Lawrence to the sea, irrespective of all intermediate localities. It is also on the shortest line that can be built between Montreal and St. John City in New Brunswick.

The companies building the Portland and Montreal railway adopted a gauge of 5½ feet, differing from all the New England and Canadian roads.—This aroused great opposition, and one of the roads extending east of Portland, the Kennebec and Portland railroad company, adopted the gauge of 4 feet 8½ inches, and refused to connect with the Montreal, and extended a parallel line from Portland to the Kennebec river at Bath, and the work of construction is now going on from Brunswick to Augusta, the capital of Maine.

The friends of the Montreal road, having procured a charter at the same time for a line of road from some point on their line, to the Kennebec river at Waterville, took up the stock, and constructed a road from Lewiston to Waterville, a point 20 miles nearer to Bangor than Augusta, on the same gauge as that of the Montreal line. Both these roads are aiming for Bangor. There is no possible chance for a more direct route from Augusta to Bangor, than by the way of Waterville. There is a long continued mountainous ridge extending from the seaboard in the county of Lincoln, between the Penobscot and Kennebec rivers, till it sweeps down the northern slopes of the Dixmont hills into the Sebastcook valley. The most direct route then from Bangor to Augusta or the Kennebec valley, must pass north of the Dixmont mountains.

A line from Bangor to the Kennebec river should strike the river opposite Waterville. It may then take either bank to Augusta.

The question of gauge at once comes up as a source of difficulty. The road to Waterville, 82 miles from Portland, is already built on the broad gauge. The line from Portland to Augusta is nearly finished 60 miles, and the company can command the means to extend it to a point of easy connection with the Bangor road.

Each road is anxious to secure the great eastern travel, and the Bangor road assumes greater and greater consequence, as the prospects of the extension of the European and North American railway are enhanced.

Under these circumstances, by a reference to the map of Maine, any one can perceive that the Bangor road is a position to command the aid of one of the above companies.

If the Atlantic company would boldly take hold of the line from Waterville to Bangor, and thereby secure the great eastern line as well as the Montreal traffic and travel, it would eventually make the stock of that company one of the most valuable in the country. Occupying the only pass in the short line to Montreal, and the route, too, of the great eastern travel, it would make the stocks of that road at a premium, in a very short time, in the English stock market. It would retain permanently in its own hands the travel of the north and the east.

Again, on the other hand, if the Portland and Augusta company can secure the line to Bangor, and by its necessary connections at Portland with the Boston roads, command the line east, an unbroken line of railway from Boston, Bangor, and finally to Halifax, might be secured to them in the same manner.

The importance of this line arises mainly from the configuration of the country itself, and cannot, consequently, be changed under any circumstances whatever.

We look with great interest upon the movements now going on, and shall be happy if any friends there will give us early information in relation to them.

Whatever may be our feelings or our prepossessions, we have stated the question fairly—at any rate we have so intended.

The completion of the line to Bangor cannot long be deferred, and this will give an additional impetus to the European and North American railway.

British American Provinces.

St. Andrews and Quebec Railway.

The public have so often heard of the flattering prospects of the Provincial railways, that they have become somewhat incredulous as to the common newspaper assurances of their progress. The success of the Montreal and Portland railway, however, has given confidence to the people of the Provinces of their ability to execute railway works, and some of the Provincial schemes are at this time among the most promising ones before the public.

In Montreal recently a move has been made to take measures for extending the Portland line to Prescott, with a view to its extension hence on the north shore of the St. Lawrence to Kingston, Toronto and Hamilton, and to a point opposite Detroit. Though under different charters, eventually forming one line. Quebec is to build a line to Melbourne, there to connect with the Portland and Montreal line.

In the Lower British Provinces, it is in contemplation to get a charter for the Halifax and Portland railway at the coming session of the Provincial Parliament, in January next, and the "European and North American Railway" seems likely to go forward with good assurance of success. St. John city and vicinity have already subscribed \$300,000 in advance of procuring the charter, and are rapidly pushing their surveys of the line from St. John to the boundary of Maine.

The *St. Andrews and Quebec Railway* is now rapidly progressing from the harbor of St. Andrews toward Woodstock, on the St. John river, a distance of about 80 miles.

This company, in addition to a liberal charter, obtained from the Provincial government a grant of the unappropriated lands for the distance of five miles on each side of the line. This grant embraced about 260,000 acres between St. Andrews and Woodstock. Much of this land is valuable for its timber, in addition to its agricultural capabilities.

The authorised stock of the company is £200,000 sterling. Of this amount, £100,000 is taken in England, and the stockholders are allowed *one acre of land* for every £1 sterling paid up. This has given the company the command of £100,000 in cash funds on hand.

Julius Thompson, Esq., has been appointed agent of the company, and came out under the direction of the English stockholders in October last. Under his auspices, the work of construction is going on with vigor.

One section of the road was placed under contract in 1850. *JOHN G. MYERS, Esq.*, the contractor, is driving the work with great vigor. Five miles of the road, from St. Andrews to Chamcook, is entirely graded, and a portion of the superstructure laid. A vessel with iron and machinery, was despatched from England some time since, and it is expected that the cars will run from St. Andrews to Chamcook the present winter. The next division of the road, from Chamcook to Bartlett's Pond, is to be opened in the spring. A further distance of sixteen miles, carrying the road to the northwest branch of the Digedegash river, is to be put under contract immediately, and prosecuted with vigor, and it is expected that the line to Woodstock, 80 miles, will be in operation in 18 months from the close of the present year, 1850.

The officers of the company are:

DIRECTORS.

John Wilson, Esq., of Chamcook, President.
Admiral Owen, of Campo Bello.
Capt. J. Robinson, "
Charles Moses, Esq., "
John Farmer, Esq., "
Hon. H. Hatch, of St. Andrews.
Harris H. Hatch, Esq., "
Geo. D. Street, Esq., "
E. Wilson, Esq., "
Hon. Geo. S. Hill, of St. Stephens.
Geo. J. Thompson, Esq., "
Chas. Cornell, Esq., of Woodstock.
J. R. Tupper, Esq., "
John Rogers, Esq., of St. Andrews, Treasurer.
J. H. Whitlock, Esq., " Secretary.
A. P. Robinson, Esq., of Portland, Maine, Consulting Engineer.
Alex. L. Light, of St. Andrews, Chief Engineer.

Ohio.

Railroads from Cleveland to Toledo.—The people of the northern part of Ohio seem determined to have two lines of railroad to connect the above places; one running by the lake shore and through Sandusky city, and the other by way of Wellington, Norwalk and Fremont; the two lines being from 10 to 15 miles apart. Both lines apparently have obtained sufficient means for their construction. The latter is aided and encouraged by the Cleveland and Columbus railroad company, over whose line it will run to Wellington, and the Michigan Southern railroad. The Mad river road, on

the other hand, looks upon the former as a virtual continuation of its line to Cleveland, and will aid it for this reason. Sandusky city proposes to subscribe \$100,000 to this line for the purpose of protecting herself from the influence of a railroad in her rear.

The Cleveland, Norwalk and Toledo company have already commenced operations, and have advertised the letting of the western division of their line from Toledo to Fremont. Mr. Durbin, the Engineer of the Lake Shore road, is now engaged in making surveys for this company from Toledo to Sandusky Bay. Both of the proposed lines are, we presume, very favorable for railroads, and the country between the Maumee river and Sandusky Bay is very nearly a dead level. Whether two parallel lines will pay, is a matter which concerns the parties interested; the public will not of course object to the rival routes, which may assist each other in dropping down the rate of fare a peg or two. These lines will be completed as soon as their connections further east, so we may look for a simultaneous opening of the various parts which will compose the great line of railroad from Buffalo to Chicago.

Commerce of New York.

The imports at New York for November, show a decrease of about three millions of dollars as compared with October, of which two and a half millions were merchandise. The aggregate of the five months to 30th November, have been—

1850.....	\$63,500,552
1849.....	43,903,672

Increase.....\$19,596,880

Of this increase seven and a half millions were in specie and bullion. The aggregates of exports for the same period was as follows:

1850.....	\$35,735,206
1849.....	21,720,452

Increase.....\$14,014,754

OHIO AND MISSISSIPPI RAILROAD.

At a meeting of the directors of this road held at the Burnet House, Cincinnati, on the 20th ult., the following officers were elected:

President—Judge Ellis, of Vincennes, Ia.

Secretary—H. H. Goodman, of Cincinnati, Ohio.

Treasurer—Henry Hanna, of Cincinnati, Ohio.

Speaking of the above, the Cincinnati Commercial says:

"The last two gentlemen are well known to our citizens, and we are sure no person of character would hazard his reputation in saying that better selections could have been made. As for the President, Judge Ellis, we have known him for some time, and hazard nothing in saying that a better selection could not have been made. Indeed, the high commanding worth of the directory, elected day before yesterday, insures the service of the very best of men for the above offices, that the whole section of the country, on the line of the road, could produce."

Portland and Montreal Railroad.

The work on this road is going on with extraordinary activity at both ends of the line. The cars will run from Portland to Bethel, 70 miles, during the present year. From Montreal to Melbourn, a distance of 72 miles, the rails are being rapidly laid, and the cars are expected to run to Melbourn in January, completing the entire line within 130 miles.

The Canadian debentures are already proposed

to be issued to the company on the completion of the road the extent of one-half its length, or 63 miles. This gives the company about \$2,000,000 of cash funds, with which it is now proposed to complete the road in eighteen months, or some six months in advance of the time contemplated in the contract with Messrs. Wood, Black & Co.

We learn that at Portland a plan is matured for raising the balance of the means required for the completion of their portion of the work. The stockholders at Portland propose to advance \$750,000 on the company's bonds at 6 per cent; this amount will enable the company to complete the entire line to the boundary.

The line of the Atlantic and St. Lawrence railroad in Vermont, was located in October last, following up the Nuhegan valley, and crossing the boundary in the township of Nuton. The work of construction is going forward on the line from Bethel to the Connecticut river, and the road is to be opened to that point in 1851.

The railroads between Boston and Portland have joined with the Atlantic and St. Lawrence railroad in building a spacious hotel on the line of the road just under the shadow of Mount Washington, in the town of Gorham, N. H. The road is to be opened to this point, 90 miles from Portland, in June next, in season to take the pleasure travel to the White Mountains. The Montreal road passes the White Mountains on the northeast, and from their station house at Gorham to the summit of Mount Washington is but about 5 miles.

This route will necessarily attract the principal travel to the mountains the ensuing year.

Virginia.

The people of that part of Virginia between Charlottesville and Lynchburgh are agitating the subject of the construction of a railroad between these places, for the purpose of connecting the Central with the Virginia and Tennessee railroad, and forming with the Orange and Alexandria road a direct-through route north. The distance between Charlottesville and Lynchburgh is about 60 miles, and the length of the line from Alexandria to Gordonsville, on the Central railroad, is 89 miles, from Gordonsville to Charlottesville the distance is 21 miles, making the whole distance from Alexandria to Lynchburgh 170 miles. The line from Charlottesville to Lynchburgh is the only part of the great interior route upon which operations have not yet commenced. We presume that immediate measures will be taken to commence this portion of the work. Independent of local considerations, the above road must be built to make perfect the great line of which we have spoken.

Maine.

Penobscot and Kennebec Railroad.—At a meeting of the Penobscot and Kennebec railroad, held at Waterville, on Thursday, the board was organised as follows:

George W. Pickering, President.

M. L. Appleton, Clerk and Secretary.

George A. Thatcher, Treasurer.

A meeting of the directors is to be held at Waterville on the 27th inst., to decide upon the location of the line, and the question as to their connection with other roads.

NEW YORK RAILROAD RETURNS.

Our readers will find in to-day's paper the returns of a portion of the N. York railroads for this year. These are now made in September of each year, instead of January, as formerly.

Indiana.

Terre Haute and Richmond Railroad.—We are informed by those who are most acquainted with the progress of this road, that the grading of said road from Greenville to Knightstown, was on the 27th ult., sold out to responsible bidders at low rates, and that the work on the same will commence as soon as the weather will admit, and that the grading of the same from Centerville to the State-line, is also let; and notice of the letting of the grading and grubbing from Centerville to Knightstown, which was advertised to take place on the 5th inst.; which leaves but 20 miles, viz: from Greenfield to Indianapolis, of the entire road to be hereafter let.—*Indiana State Sentinel.*

New York.

Rochester and Lockport Railroad.—The stock of this road having been subscribed in full, a meeting of stockholders was held on the 10th inst. for the election of a board of directors, at which Joseph B. Varnum and Edward Whitehouse, of New York; Watts Sherman, of Albany; Freeman Clarke, Silas O. Smith, and A. Boody, of Rochester; Alexis Ward and Roswell W. Burrows, of Albion; and Elias B. Holmes, of Brockport, were chosen directors.

At a subsequent meeting of the board of directors, Mr. J. B. Varnum was elected President, Alexis Ward Vice-President, and Freeman Clarke, Treasurer.

We learn that it is the intention of the company to proceed at once with the construction of the road, and complete it as soon as possible. The distance from Rochester to Lockport will be fifty five miles. The old road to Niagara Falls, from Lockport, which was some time since purchased by the President of this company, Mr. Varnum, and others, will be reconstructed in a substantial manner.

When both roads are completed, the line will be seventy-four miles in length.

New York.

Buffalo and State Line Railroad.—The Rochester and Syracuse railroad company take \$100,000 of the stock of the Buffalo and State Line railroad and the Syracuse and Utica \$60,000. The Utica and Schenectady refused to take stock, but offered to loan that road \$100,000. At a meeting of the board of directors held at Buffalo on the 29th ult., it was decided to put the contractors at work on the whole line as speedily as the right of way is obtained from the owners of land. The question of route was definitely settled by the board at the above meeting by retaining the route heretofore adopted in accordance with the special act of the Legislature, which route passes through the villages of Irving, Silver Creek Fredonia and Westfield. We may now look for an energetic prosecution of the above work.

Travel North.

The Ashuelot Railroad, which is just opened, forms a continuous line of railroad from this city to the Canada line; and during the next summer New York and Montreal will be connected by an unbroken line of railway. The railroad from Whitehall to Rutland is soon to be opened, giving another and a still shorter route. A line of swift steamers are to be placed on the river between Montreal and Quebec, which will greatly facilitate travel in that direction. Every part of Canada will soon become as accessible from New York, both in summer and winter, as any portion of the "States," so that annexation will soon be consummated, *de facto, et non de jure.*

Nearly every line of railroad now completed

serves to connect other lines already in operation, thus linking together, in one system, the isolated portions which have hitherto depended mainly upon local business and travel for their support. As this is accomplished, the business that was peculiar to each becomes the life blood of all. The value and usefulness of railroads will be doubled. It is to this which is to be attributed in a great measure the great increase in railroad receipts, and advance in railroad property; and this improvement must go on in proportion as this connection becomes more complete and perfect.

Census of Maine.

The following table shows the number of inhabitants of this State in 1850, compared by counties, with the census of 1840:

Counties.	1850.	1840.	Increase.
York.....	60,094	54,023	6,071
Cumberland.....	79,547	68,660	10,887
Lincoln.....	74,803	63,512	11,291
Hancock.....	34,374	28,646	5,726
Washington.....	38,711	28,309	10,402
Kennebec.....	62,524	51,804	6,720
Oxford.....	39,766	38,339	1,427
Somerset.....	35,591	33,952	1,679
Penobscot.....	63,094	45,705	17,389
Waldo.....	47,229	41,535	5,694
Piscataquis.....	14,735	13,138	1,597
Franklin.....	20,027	20,800	
Aroostook.....	12,535	9,413	3,120

583,026 501,796 82,003
Deduct decrease of Franklin county, 773

Increase in 10 years, 16 1-20 per cent.

New Hampshire.

Ashuelot Railroad.—This road was opened for travel on the 9th inst. It is 23 miles in length—about 10 of which is a straight line—and is one of the best constructed in New England. From Keene to West Winchester, a distance of 15 miles, the grade is within 15 feet to the mile, and beyond that point it does not exceed 30. The bridge over the Connecticut river is said to be a most substantial and elegant structure. Besides this, there are four bridges of considerable length over the Ashuelot river, which are most permanently built.

Steam Communication with Europe.

The merchants of Baltimore are memorializing Congress to aid in the establishment of a line of steamers between Chesapeake Bay and Liverpool, by entering into a postal arrangement with a company to be formed in Baltimore city, similar to the one made with the Collins' line, running from New York.

RAILROAD FROM THE BALTIMORE AND SUSQUEHANNA RAILROAD TO WESTMINSTER.

A meeting was recently held at Westminster, Carroll county, for the purpose of promoting the above object. The Carrolltonian says the meeting was a large one, and very enthusiastic in support of the measure.

The meeting was called to order by Major Jacob Mathias, Chairman. The President of the Baltimore and Susquehanna railroad company, Mr. Magraw, was introduced, and occupied the attention of the meeting in an elaborate and well-timed speech, presenting his views in an enlarged form, respecting the different routes proposed, from Owings' Mill by way of Reisterstown, the copper mines, etc.—another route, from Cockeysville to Dover, Hampstead, etc.—and another from near Love's switch, Black Rock, etc. He presented much information in regard to the travel and revenue of the road, and was so well convinced of its

yielding a good per centage, that he pledged himself as one of two hundred to build it. The estimated cost of construction is \$240,000.

Other speeches were made, and committees were appointed for the purpose of ascertaining the amt. of money that could be raised on the different routes, and learn the extent of the right of way that would be given free of charge.

India-rubber Goods for Rail Road Purposes.

THE Goodyear Metallic India rubber Co., (F. M. Ray, Agent) No. 104 Broadway, New York, (1 door from Pine street) has on hand and offers for sale at the lowest prices, an extensive assortment of Rubber Goods suitable for Railroad Companies, such as Hose of all sizes, Fire Buckets, Water Pails, Steam Packing, Car Covers, Tarpaulins, Clothing of all kinds for brakemen, switchmen, etc. Belting, and many other articles—all manufactured from Goodyear's Metallic India-rubber, and warranted to give satisfaction.

India-rubber HOSE is in use upon many railroads, for Tanks and Water Stations. It requires no oiling, is unaffected by heat or cold and is in every respect a most desirable article, and much superior to leather. All sizes, from 1 in. to 6 in., or larger if needed, made to order.

The reputation of India-rubber for steam packing is well established, and it is now almost universally preferred to any other kind of packing. It will stand a higher degree of heat and last longer than any other substance. An assortment of every thickness from 1-2d in. to 1 in. always on hand.

Every article sold by the Goodyear Metallic India-rubber Co. is warranted, and will be offered to railroad companies at the lowest factory prices.

The Goodyear Metallic India-rubber Co. is a connection of the New England Car Co., and in addition to its large stock of goods for railroad and other purposes, has on hand a large assortment of F. M. Ray's Patent India-rubber Car Springs, both bearing and buffer, of all sizes.

Notice to Contractors.

COVINGTON AND LEXINGTON RAILROAD.—Sealed Proposals will be received at the office of the Covington and Lexington Railroad Company, in this city, until the seventh day of January next, for grading eighteen (18) miles of the Covington railroad, commencing at the proper end of section No. twenty, (20) near E. Clarkson's house, and extending up the valley of the Licking river, and along the left or Western bank to the town of Falmouth, in Pendleton county. The proposals will include all the excavations and embankments, and the masonry for culverts; also the masonry for bridges.

Plans and specifications of the work to be done and the terms of payment may be seen at the office of the Company, at any time between the twenty-seventh of December and the seventh of January.

SYLVESTER WELCH,

Engineer Covington and Lexington Railroad.
Office of the Covington and Lexington Railroad,
Covington Ky., Nov. 25th, 1850.

Notice to Contractors.

ENGINEER'S OFFICE E. T. AND VA. R. R. CO., }
Jonesborough, Nov. 30th, 1850. }

SEALED PROPOSALS for the graduation and masonry of forty miles of the East Tennessee and Virginia Railroad will be received at the Office of the Chief Engineer, Greenville, Greene County, E. Tenn., until the 15th day of January next.

A fine opportunity here presents itself to good contractors. Labor and supplies abundant and cheap, the country remarkably healthy, and every opportunity for the successful prosecution of the work.

This link of forty miles commences at McBee's Ferry, on Holston River, 15 miles east of Knoxville, and extends to Bull's Gap.

A fine variety of work will be offered, and experienced contractors would do well to give it their attention.

Specifications, maps, profiles, &c., &c., will be in readiness for the inspection of contractors by the 25th of December.

By order of the Board,
LLOYD TILGEMAN,
Chief Engineer.

Great Work on Bridge Building, etc., etc.

JUST published in medium folio, One Dollar, 75 cts. to subscribers.

Part IV of a "THEORETICAL AND PRACTICAL TREATISE ON THE CONSTRUCTION OF BRIDGES IN STONE, IRON AND WOOD," including the Equilibrium of Arches, the mathematical principles of the Oblique Arch, Suspension Arch, etc., Construction of Foundations in Water, Centering, Oblique Arches, etc., the application of Iron to Railroad Structures, Practical Tunnelling, Suspension Bridges, etc.; illustrated by numerous accurately executed Plans, Elevations, Sections and Details of Stone, Iron and Wood Bridges, Viaducts, Tunnels, Culverts, Machines, etc., constructed by the most eminent Architects and Engineers in Europe and the United States, and numerous Original Designs for Bridges, Viaducts, Culverts, etc. The whole calculated to meet the exigencies of Engineers, and assist Draughtsmen, Bridge Builders, Mechanics and Students. By George Duggan, Architect and Civil Engineer.

The present part contains beautifully executed plans, elevations, sections, and details of the Iron Lattice Bridge 140 feet span over the canal in the suburbs of Dublin on the line of the Dublin and Drogheda R.R., Plans, elevations and sections of the Timber Bridge over the Schuylkill, at Market st., Philadelphia, with Arches 160 and 190 feet span. Plans, elevations and sections of a Timber Bridge with Arches 155 and 200 feet span over the Delaware. Also, plans, elevations, sections and details of Lattice and Frame Wood Bridges, explanatory of Nathaniel Towns and Colonel S. H. Long's methods of constructing Bridges of Wood, with the continuation of the Articles on Cofferdams, Concrete, Limes, Mortars, Cements, etc.

Published by George Duggan, 300 Broadway, New York, to whom all communications should be addressed and subscriptions forwarded.

Parties remitting Mr. Duggan \$5. and the remainder \$4 when they have been supplied with the first six parts of the "Theoretical and Practical Treatise on Bridge Building, etc." shall receive it monthly as published. To those making Mr. Duggan a present remittance of \$9, the work will be forwarded post free to any part of the United States.

Great American Engineering

AND MECHANICAL WORK, just published in medium folio One Dollar, 75 cts. to Subscribers.

Part X. of "Specimens of the Stone, Iron & Wood Bridges, Viaducts, Tunnels, Culverts, &c., &c., of the United States Railroads." By George Duggan, Architect and Civil Engineer.

The present part contains beautifully executed plans, elevations, and sections of the Timber Bridge with Arches 136 feet span, over the Mohawk river, on the line of the Utica and Schenectady R.R. Plans elevations, sections and isometrical views of Timber Piers 100 feet high, a Timber Bridge of 55 feet span, and Ice Breakers, on the line of the Little Schuylkill and Susquehanna R.R.

Also plans, elevations, sections, isometrical views and details of an Iron Bridge 356 feet long, with Arches 70 feet span, erected by the N. York Iron Bridge Co. over Morris Creek, on the line of the Virginia Central R.R., and plans, elevations and sections of an Iron Plank Road Bridge 160 feet span, erected over Buffalo creek by the same company, with a description of Col. Long's method of constructing Bridges in Iron, and an explanation of the causes that led to the failure of the Iron Bridge 60 feet span, near Lackawaxen, on the line of the New York and Erie R. R., at midday, on the 31st July last, by which several lives were lost, and a great amount of property destroyed.

Published by **GEORGE DUGGAN,** 300 Broadway, New York.

To whom all communications should be addressed and subscriptions forwarded.

Railroad Lanterns.

COPPER and Iron Lanterns for Railroad Engines, fitted with heavy silver plated Parabolic Reflectors of the most approved construction, and Solar Argand Lamps; manufactured by

HENRY N. HOOPER & CO.,
No. 24 Commercial St. Boston.

August, 16, 1849.

6m33

Gas Fixtures.

FIXTURES for Burning Gas for Lighting Public Buildings, Private Dwellings, Stores and Factories, manufactured by the subscriber in great variety. Orders by Mail, or left at the Factory on Causeway street, will be promptly attended to.

HENRY N. HOOPER & CO.
Boston, March 23, 1850. 6m13

Emerson's Patent Ventilator,

ADAPTED to Cars, Engine houses, Public Halls, Factories, Churches, School Houses, Dwellings, Chimney Flues, etc.



This Ventilator is stationary, and cannot get out of order. It is constructed in such conformity to certain ascertained laws of pneumatics, as to insure a constant draft outward, whatever may be the changing direction of the wind. The Massachusetts Mechanic Association have awarded a gold medal to the Inventor, and the Manufacturers have already disposed of over 3,000 of the article. Manufactured and sold by **CHILSON, ALLEN, WALKER & Co.,** 351 Broadway, New York.

Providence Tool Co.,

MANUFACTURERS OF

Plane Irons, Tooth Irons, Soft Moulding and Rabbit Irons, Cornice Irons, Plow Bits, and Planing Machine Knives:

NUTS, WASHERS AND BOLTS.

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PLATE HINGES AND PICK AXES.

They are prepared to execute orders for all descriptions of Cold Punching and Job Work.

WM. FIELD, Agent. RUFUS WATERMAN, Treas. PROVIDENCE, R. I.

Ibbotson, Brothers & Co's CELEBRATED CAST STEEL

AND

Best Cast Steel Royal Improved Files, well known as better adapted for Engineers' and Machinists' purposes than any now in use in the United States.

Every description of Square, Octagon, Flat and Round Cast Steel, Sheet, Shovel and Railway Spring Steel, etc., and Steel to order for any purposes—manufactured at their works in Sheffield—and universally known by the old stamp "Globe."

HENRY I. IBBOTSON, Agent,
218 Pearl st., New York.

Fagotted Car and Engine Axles

FORGED by RANSTEAD, DEARBORN & Co.,
Boston, Mass.

These Axles enjoy the highest reputation for excellence, and are all warranted.

American Cast Steel.

THE ADIRONDAC STEEL MANUFACTURING CO. is now producing, from American iron, at their works at Jersey City, N.J., Cast Steel of extraordinary quality, and is prepared to supply orders for the same at prices below that of the imported article of like quality. Consumers will find it to their interest to give this a trial. Orders for all sizes of hammered cast steel, directed as above, will meet with prompt attention.
May 23, 1849.

To Contractors.

SCIOTO AND HOCKING VALLEY RAILROAD. Sealed Proposals will be received at the Railroad Office in Portsmouth, Ohio, until the first day of January, A. D. 1851, for the Grading, Masonry and Bridging of 25 miles of the above road—20 miles extending from Portsmouth to the 20th mile Post, two miles east of Bloomfield, Scioto county, and five miles extending from Jackson, Jackson county, southerly to station number 2046.

The character of the work is such as is usually found in the State, consisting of about 30 sections of Grading, varying from five to eighty thousand cubic yards.

Plans and specifications will be ready for examination after the 15th day of December next, and the line ready for inspection after about the 20th of December.

Contractors proposing for the Bridging may bid according to plans furnished by the Engineer, or according to plans furnished by themselves.

By order of the Board of directors

J. V. ROBINSON, President.

J. W. WEBB, Chief Engineer.

Scioto and Hocking Valley R. R. Office,
Portsmouth, Nov. 19, 1850. }

American Railway Guide.

This is the best Guide Book for Travellers now in use. It is carefully revised and corrected monthly, and contains valuable tables giving information of Southern, Western and Eastern routes, not to be found in any other publication.

CURRAN DINSMORE, Publisher,
138 Fulton st., New York.

Sold on many of the principal Railroads in the United States, and at the Periodical Depots.

The "American Railway Guide" * * will be found to contain just the information which every traveller needs with regard to the departure and arrival of trains.—[N. Y. Tribune.]

It would be difficult to devise or execute a more convenient or perfect work of its class. * * —[Hunt's Merchants' Magazine.]

This supplies information desirable for every business man who is obliged to travel, and he can carry the book conveniently in his pocket, for reference at all times.—[Philadelphia Ledger.]

The most complete and accurate guide ever published.—[Scientific American.]

It is the best and cheapest book of the kind ever issued.—[Sunday Dispatch.]

NOTICE

For Proposals for Railroad Iron, for the Alabama and Tennessee River Railroad,

TO BE MANUFACTURED FROM ALABAMA ORE.

THE Alabama and Tennessee River Railroad Co. invite proposals, until the 1st of January, 1851, for Iron Rails, to be made of Alabama Iron, for the Northern Division and part of the Southern Division of their road, embracing a distance of about 105 miles. The rails are to be of the H pattern, in lengths of 18 feet, and weighing 63 lbs. per lineal yard. They are to be delivered on the Coosa river, at a landing to be hereafter designated, between Kimulgee ferry and Fort Williams, commencing their delivery on the 1st of November, 1851, and continuing it at the rate of from 80 to 100 tons per week, until the whole quantity required (10,500 tons) shall have been delivered. They are to be inspected by Lewis Troost, Chief Engineer.

It is proper to state to iron masters and capitalists at a distance, that the country traversed by the Northern and part of the Southern divisions of the road abounds in excellent iron ore and bituminous coal, and possesses every advantage for the successful manufacture of iron, health, cheap labor and provisions.

Further information may be obtained by addressing the President of the Company, at Selma, Ala.

By order of the Board of Directors.

J. W. LAPSLEY, President.

Boardman's Patent Improved Steam Boiler and Furnace.

THE Patentee is now prepared to sell and/or territorial rights to the use of the above named improvement. Recent experiments have demonstrated that this form of Boiler effects a saving of one half the fuel required to run the best Cylinder Boiler with return flues, and about 40 per cent. of the amount used by Locomotive Boilers. The heat is so thoroughly applied to the water that the temperature in the chimney is reduced below 140 deg. The smoke and combustible gases are consumed within the furnace. The refuse gas instantly extinguishes flame or sparks, so that all danger from sparks is avoided. This Boiler is very compact in form, occupying less space than any other of like power.

References—Thomas H. Faxon, Chief Engineer U. S. Mail Steamer Arctic, N.Y.; Messrs Mott & Ayres, and Mr. D. F. Jaycox, Chelsea Iron Works, 26th street N.Y.; Messrs. Tugnot, Daily & Co., Franklin Forge, 1st avenue, N.Y.; Mr. John Mills, Machinist, 319 5th street, N.Y.; Mr. W. C. Smith, St. Albans, Vermont; and Messrs. Goulding, H. BOARDMAN, 124, Fulton-st. N. Y.

Railroad Iron.

THE "Montour Iron Company" is prepared to execute orders for Rails of the usual patterns and weights, and of any required length not exceeding 30 feet per rail. Apply at the office of the Company, No. 74 South 3d st., Philadelphia.

Or to the Agents,

CHOUTEAU, MERLE & SANFORD,

No. 51 New st., New York.

September, 1850.

Indiana.

Terre Haute and Richmond Railroad.—We are informed by those who are most acquainted with the progress of this road, that the grading of said road from Greenville to Knightstown, was on the 27th ult., sold out to responsible bidders at low rates, and that the work on the same will commence as soon as the weather will admit, and that the grading of the same from Centreville to the State-line, is also let; and notice of the letting of the grading and grubbing from Centreville to Knightstown, which was advertised to take place on the 5th inst.; which leaves but 20 miles, viz: from Greenfield to Indianapolis, of the entire road to be hereafter let.—*Indiana State Sentinel.*

New York.

Rochester and Lockport Railroad.—The stock of this road having been subscribed in full, a meeting of stockholders was held on the 10th inst. for the election of a board of directors, at which Joseph B. Varnum and Edward Whitehouse, of New York; Watts Sherman, of Albany; Freeman Clarke, Silas O. Smith, and A. Boddy, of Rochester; Alexis Ward and Roswell W. Burrows, of Albion; and Elias B. Holmes, of Brockport, were chosen directors.

At a subsequent meeting of the board of directors, Mr. J. B. Varnum was elected President, Alexis Ward Vice-President, and Freeman Clarke, Treasurer.

We learn that it is the intention of the company to proceed at once with the construction of the road, and complete it as soon as possible. The distance from Rochester to Lockport will be fifty five miles. The old road to Niagara Falls, from Lockport, which was some time since purchased by the President of this company, Mr. Varnum, and others, will be reconstructed in a substantial manner.

When both roads are completed, the line will be seventy-four miles in length.

New York.

Buffalo and State Line Railroad.—The Rochester and Syracuse railroad company take \$100,000 of the stock of the Buffalo and State Line railroad and the Syracuse and Utica \$60,000. The Utica and Schenectady refused to take stock, but offered to loan that road \$100,000. At a meeting of the board of directors held at Buffalo on the 29th ult., it was decided to put the contractors at work on the whole line as speedily as the right of way is obtained from the owners of land. The question of route was definitely settled by the board at the above meeting by retaining the route heretofore adopted in accordance with the special act of the Legislature, which route passes through the villages of Irving, Silver Creek Fredonia and Westfield. We may now look for an energetic prosecution of the above work.

Travel North.

The Ashuelot Railroad, which is just opened, forms a continuous line of railroad from this city to the Canada line; and during the next summer New York and Montreal will be connected by an unbroken line of railway. The railroad from Whitehall to Rutland is soon to be opened, giving another and a still shorter route. A line of swift steamers are to be placed on the river between Montreal and Quebec, which will greatly facilitate travel in that direction. Every part of Canada will soon become as accessible from New York, both in summer and winter, as any portion of the "States," so that annexation will soon be consummated, *de facto*, if not *de jure*.

Nearly every line of railroad now completed

serves to connect other lines already in operation, thus linking together, in one system, the isolated portions which have hitherto depended mainly upon local business and travel for their support. As this is accomplished, the business that was peculiar to each becomes the life blood of all. The value and usefulness of railroads will be doubled. It is to this which is to be attributed in a great measure the great increase in railroad receipts, and advance in railroad property; and this improvement must go on in proportion as this connection becomes more complete and perfect.

Census of Maine.

The following table shows the number of inhabitants of this State in 1850, compared by counties, with the census of 1840:

Counties.	1850.	1840.	Increase.
York.....	60,094	54,023	6,071
Cumberland.....	79,547	68,660	10,887
Lincoln.....	74,803	63,512	11,291
Hancock.....	34,374	28,646	5,726
Washington.....	38,711	28,309	10,402
Kennebec.....	62,524	51,804	6,720
Oxford.....	39,766	38,339	1,427
Somerset.....	35,591	33,952	1,639
Penobscot.....	63,094	45,705	17,389
Waldo.....	47,229	41,535	5,694
Piscataquis.....	14,735	13,138	1,597
Franklin.....	30,027	20,800	
Aroostook.....	12,535	9,413	3,120
	593,026	501,796	82,003
Deduct decrease of Franklin county,			773
			81,230

Increase in 10 years, 16 1-20 per cent.

New Hampshire.

Ashuelot Railroad.—This road was opened for travel on the 9th inst. It is 23 miles in length—about 10 of which is a straight line—and is one of the best constructed in New England. From Keene to West Winchester, a distance of 15 miles, the grade is within 15 feet to the mile, and beyond that point it does not exceed 30. The bridge over the Connecticut river is said to be a most substantial and elegant structure. Besides this, there are four bridges of considerable length over the Ashuelot river, which are most permanently built.

Steam Communication with Europe.

The merchants of Baltimore are memorializing Congress to aid in the establishment of a line of steamers between Chesapeake Bay and Liverpool, by entering into a postal arrangement with a company to be formed in Baltimore city, similar to the one made with the Collins' line, running from New York.

RAILROAD FROM THE BALTIMORE AND SUSQUEHANNA RAILROAD TO WESTMINSTER.

A meeting was recently held at Westminster, Carroll county, for the purpose of promoting the above object. The Carrolltonian says the meeting was a large one, and very enthusiastic in support of the measure.

The meeting was called to order by Major Jacob Mathias, Chairman. The President of the Baltimore and Susquehanna railroad company, Mr. Magraw, was introduced, and occupied the attention of the meeting in an elaborate and well-timed speech, presenting his views in an enlarged form, respecting the different routes proposed, from Owings' Mill by way of Reisterstown, the copper mines, etc.—another route, from Cockeysville to Dover, Hampstead, etc.—and another from near Love's switch, Black Rock, etc. He presented much information in regard to the travel and revenue of the road, and was so well convinced of its

yielding a good per centage, that he pledged himself as one of two hundred to build it. The estimated cost of construction is \$240,000.

Other speeches were made, and committees were appointed for the purpose of ascertaining the amt. of money that could be raised on the different routes, and learn the extent of the right of way that would be given free of charge.

India-rubber Goods for Railroad Purposes.

THE Goodyear Metallic India rubber Co., (F. M. Ray, Agent) No. 104 Broadway, New York, (1 door from Pine street) has on hand and offers for sale at the lowest prices, an extensive assortment of Rubber Goods suitable for Railroad Companies, such as Hose of all sizes, Fire Buckets, Water Pails, Steam Packing, Car Covers, Tarpaulins, Clothing of all kinds for brakemen, switchmen, etc. Belting, and many other articles—all manufactured from Goodyear's Metallic India-rubber, and warranted to give satisfaction.

India-rubber HOSE is in use upon many railroads, for Tanks and Water Stations. It requires no oiling, is unaffected by heat or cold and is in every respect a most desirable article, and much superior to leather. All sizes, from 1 in. to 6 in., or larger if needed, made to order.

The reputation of India-rubber for steam packing is well established, and it is now almost universally preferred to any other kind of packing. It will stand a higher degree of heat and last longer than any other substance. An assortment of every thickness from 1-2d in. 1 1/2 in. always on hand.

Every article sold by the Goodyear Metallic India-rubber Co. is warranted, and will be offered to railroad companies at the lowest factory prices.

The Goodyear Metallic India-rubber Co. is a connection of the New England Car Co., and in addition to its large stock of goods for railroad and other purposes, has on hand a large assortment of F. M. Ray's Patent India-rubber Car Springs, both bearing and buffer, of all sizes.

Notice to Contractors.

COVINGTON AND LEXINGTON RAILROAD.—Sealed Proposals will be received at the office of the Covington and Lexington Railroad Company, in this city, until the seventh day of January next, for grading eighteen (18) miles of the Covington railroad, commencing at the proper end of section No. twenty, (20) near E. Clarkson's house, and extending up the valley of the Licking river, and along the left or Western bank to the town of Falmouth, in Pendleton county. The proposals will include all the excavations and embankments, and the masonry for culverts; also the masonry for bridges.

Plans and specifications of the work to be done and the terms of payment may be seen at the office of the Company, at any time between the twenty-seventh of December and the seventh of January.

SYLVESTER WELCH,

Engineer Covington and Lexington Railroad.
Office of the Covington and Lexington Railroad,
Covington Ky., Nov. 25th, 1850.

Notice to Contractors.

ENGINEER'S OFFICE E. T. AND V. R. R. CO., }
Jonesborough, Nov. 30th, 1850. }

SEALED PROPOSALS for the graduation and masonry of forty miles of the East Tennessee and Virginia Railroad will be received at the Office of the Chief Engineer, Greenville, Greene County, E. Tenn., until the 15th day of January next.

A fine opportunity here presents itself to good contractors. Labor and supplies abundant and cheap, the country remarkably healthy, and every opportunity for the successful prosecution of the work.

This link of forty miles commences at McBee's Ferry, on Holston River, 15 miles east of Knoxville, and extends to Bull's Gap.

A fine variety of work will be offered, and experienced contractors would do well to give it their attention.

Specifications, maps, profiles, &c., &c., will be in readiness for the inspection of contractors by the 25th of December.

By order of the Board,
LLOYD TILGHMAN,
Chief Engineer.

Great Work on Bridge Building, etc., etc.

JUST published in medium folio, One Dollar, 75 cts. to subscribers.

Part IV of a "THEORETICAL AND PRACTICAL TREATISE ON THE CONSTRUCTION OF BRIDGES IN STONE, IRON AND WOOD," including the Equilibrium of Arches, the mathematical principles of the Oblique Arch, Suspension Arch, etc., Construction of Foundations in Water, Centering, Oblique Arches, etc., the application of Iron to Railroad Structures, Practical Tunnelling, Suspension Bridges, etc.; illustrated by numerous accurately executed Plans, Elevations, Sections and Details of Stone, Iron and Wood Bridges, Viaducts, Tunnels, Culverts, Machines, etc., constructed by the most eminent Architects and Engineers in Europe and the United States, and numerous Original Designs for Bridges, Viaducts, Culverts, etc. The whole calculated to meet the exigencies of Engineers, and assist Draughtsmen, Bridge Builders, Mechanics and Students. By George Duggan, Architect and Civil Engineer.

The present part contains beautifully executed plans, elevations, sections, and details of the Iron Lattice Bridge 140 feet span over the canal in the suburbs of Dublin on the line of the Dublin and Drogheda R.R., Plans, elevations and sections of the Timber Bridge over the Schuylkill, at Market st., Philadelphia, with Arches 160 and 190 feet span. Plans, elevations and sections of a Timber Bridge with Arches 155 and 200 feet span over the Delaware. Also, plans, elevations, sections and details of Lattice and Frame Wood Bridges, explanatory of Nathaniel Towns and Colonel S. H. Long's methods of constructing Bridges of Wood, with the continuation of the Articles on Coffer dams, Concrete, Limes, Mortars, Cements, etc.

Published by George Duggan, 300 Broadway, New York, to whom all communications should be addressed and subscriptions forwarded.

Parties remitting Mr. Duggan \$5. and the remainder \$4 when they have been supplied with the first six parts of the "Theoretical and Practical Treatise on Bridge Building, etc." shall receive it monthly as published. To those making Mr. Duggan a present remittance of \$9, the work will be forwarded post free to any part of the United States.

Great American Engineering

AND MECHANICAL WORK, just published in medium folio One Dollar, 75 cts. to Subscribers.

Part X. of "Specimens of the Stone, Iron & Wood Bridges, Viaducts, Tunnels, Culverts, &c., &c., of the United States Railroads." By George Duggan, Architect and Civil Engineer.

The present part contains beautifully executed plans, elevations, and sections of the Timber Bridge with Arches 136 feet span, over the Mohawk river, on the line of the Utica and Schenectady R.R. Plans elevations, sections and isometrical views of Timber Piers 100 feet high, a Timber Bridge of 55 feet span, and Ice Breakers, on the line of the Little Schuylkill and Susquehanna R.R.

Also plans, elevations, sections, isometrical views and details of an Iron Bridge 356 feet long, with Arches 70 feet span, erected by the N. York Iron Bridge Co. over Morris Creek, on the line of the Virginia Central R.R., and plans, elevations and sections of an Iron Plank Road Bridge 160 feet span, erected over Buffalo Creek by the same company, with a description of Col. Long's method of constructing Bridges in Iron, and an explanation of the causes that led to the failure of the Iron Bridge 60 feet span, near Lackawaxen, on the line of the New York and Erie R. R., at midday, on the 31st July last, by which several lives were lost, and a great amount of property destroyed.

Published by GEORGE DUGGAN, 300 Broadway, New York. To whom all communications should be addressed and subscriptions forwarded.

Railroad Lanterns.

COPPER and Iron Lanterns for Railroad Engines, fitted with heavy silver plated Parabolic Reflectors of the most approved construction, and Solar Argand Lamps; manufactured by

HENRY N. HOOPER & CO.,
No. 24 Commercial St. Boston.
August, 16, 1849. 6m33

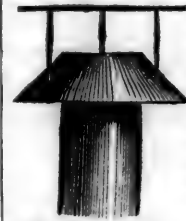
Gas Fixtures.

FIXTURES for Burning Gas for Lighting Public Buildings, Private Dwellings, Stores and Factories, manufactured by the subscriber in great variety. Orders by Mail, or left at the Factory on Causeway street, will be promptly attended to.

HENRY N. HOOPER & CO.
Boston, March 23, 1850. 6m13

Emerson's Patent Ventilator,

ADAPTED to Cars, Engine houses, Public Halls, Factories, Churches, School Houses, Dwellings, Chimney Flues, etc.



This Ventilator is stationary, and cannot get out of order. It is constructed in such conformity to certain ascertained laws of pneumatics, as to insure a constant draft outward, whatever may be the changing direction of the wind. The Massachusetts Mechanic Association have awarded a gold medal to the Inventor, and the Manufacturers have already disposed of over 3,000 of the article. Manufactured and sold by CHILSON, ALLEN, WALKER & Co., 351 Broadway, New York.

Providence Tool Co.,

MANUFACTURERS OF

Plane Irons, Tooth Irons, Soft Moulding and Rabbit Irons, Cornice Irons, Plow Bits, and Planing Machine Knives:

NUTS, WASHERS AND BOLTS.

—ALSO—

PLATE HINGES AND PICK AXES.

They are prepared to execute orders for all descriptions of Cold Punching and Job Work.

WM. FIELD, Agent. RUFUS WATERMAN, Treas.
PROVIDENCE, R. I.

Ibbotson, Brothers & Co's CELEBRATED CAST STEEL

AND

Best Cast Steel Royal Improved Files, well known as better adapted for Engineers' and Machinists' purposes than any now in use in the United States.

Every description of Square, Octagon, Flat and Round Cast Steel, Sheet, Shovel and Railway Spring Steel, etc., and Steel to order for any purposes—manufactured at their works in Sheffield—and universally known by the old stamp "Globe."

HENRY I. IBBOTSON, Agent,
218 Pearl st., New York.

Fagotted Car and Engine Axles

FORGED by RANSTEAD, DEARBORN & Co., Boston, Mass.

These Axles enjoy the highest reputation for excellence, and are all warranted.

American Cast Steel.

THE ADIRONDAC STEEL MANUFACTURING CO. is now producing, from American iron, at their works at Jersey City, N.J., Cast Steel of extraordinary quality, and is prepared to supply orders for the same at prices below that of the imported article of like quality. Consumers will find it to their interest to give this a trial. Orders for all sizes of hammered cast steel, directed as above, will meet with prompt attention.

May 28, 1849.

To Contractors.

SCIOTO AND HOCKING VALLEY RAILROAD. Sealed Proposals will be received at the Railroad Office in Portsmouth, Ohio, until the first day of January, A. D. 1851, for the Grading, Masonry and Bridging of 25 miles of the above road—20 miles extending from Portsmouth to the 20th mile Post, two miles east of Bloomfield, Scioto county, and five miles extending from Jackson, Jackson county, southerly to station number 2046.

The character of the work is such as is usually found in the State, consisting of about 30 sections of Grading, varying from five to eighty thousand cubic yards.

Plans and specifications will be ready for examination after the 15th day of December next, and the line ready for inspection after about the 20th of December.

Contractors proposing for the Bridging may bid according to plans furnished by the Engineer, or according to plans furnished by themselves.

By order of the Board of directors.

J. V. ROBINSON, President.

J. W. WEBB, Chief Engineer.

Scioto and Hocking Valley R. R. Office,
Portsmouth, Nov. 19, 1850. }

American Railway Guide.

This is the best Guide Book for Travellers now in use. It is carefully revised and corrected monthly, and contains valuable tables giving information of Southern, Western and Eastern routes, not to be found in any other publication.

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J. W. LAPSLEY, President.

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Or to the Agents,

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No. 51 New st., New York.

September, 1850.

ENGINEERS.**Atkinson, T. C.,**

Alexandria and Orange Railroad, Alexandria, Va.

Bancks, C. W.,

Civil Engineer, Vicksburg, Miss.

Buckland, George,

Troy and Greenbush Railroad.

Clement, Wm. H.,

Little Miami Railroad, Cincinnati, Ohio.

Cozzens, W. H.,

Engineer and Surveyor, St. Louis, Mo.

Alfred W. Craven,

Chief Engineer Croton Aqueduct, New York.

Davidson, M. O.,

Eckhart Mines, Alleghany Co., Maryland.

Fisk, Charles B.,

Cumberland and Ohio Canal, Washington, D. C.

Felton, S. M.,

Fitchburg Railroad, Boston, Mass.

Floyd-Jones, Charles,

South Oyster Bay, L. I.

Gzowski, Mr.,

St. Lawrence & Atlantic Railroad, Montreal, Canada.

Gilbert, Wm. B.,

Rutland and Burlington Railroad, Rutland, Vt.

Grant, James H.,

Nashville and Chattanooga R. R., Nashville, Tenn.

S. W. Hill,

Mining Engineer and Surveyor, Eagle River, Lake Superior.

Holcomb, F. P.

Southwestern Railroad, Macon, Ga.

Johnson, Edwin F.

New York and Boston Railroad, Middletown Ct.

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Baltimore and Ohio Railroad, Baltimore, Md.

Miller, J. F.,

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Morton, A. C.,

Atlantic and St. Lawrence Railroad, Portland, Me.

McRae, John,

South Carolina Railroad, Charleston, S. C.

Nott, Samuel,

Lawrence and Manchester Railroad, Boston.

Prichard, M. B.,

East Tennessee and Georgia R. R., Cleveland, Tenn.

Roebbling, John A.,

Trenton, N. J.

W. Milnor Roberts,

Bellefontaine and Indiana Railroad, Marion, Ohio.

Roberts, Solomon W.,

Ohio and Pennsylvania Railroad, Pittsburgh, Pa.

Sanford, C. O.,

South Side Railroad, Virginia.

Schlatter, Charles L.,

Northern Railroad (Ogdensburg), Malone, N. Y.

Sours, Peter,

Rahway, New Jersey.

Stark, George.,

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Steele, J. Dutton,

Pottstown, Pa.

Trautwine, John C.,

Panama Railroad—Address through office of Panama Railroad Co., 78 Broadway, N. Y.

Trimble, Isaac R.,

Philad., Wil. & Baltimore Railroad, Wilmington, Del.

Tinkham, A. W.,

United States Fort, Bucksport, Me.

Thomson, J. Edgar,

Pennsylvania (Central) Railroad, Philadelphia.

Troost, Lewis,

Alabama and Tennessee Railroad, Selma, Ala.

Whipple, S.,

Civil Engineer and Bridge Builder, Utica, N. Y.

Williams, E. P.,

Auburn and Schenectady Railroad, Auburn, N. Y.

Williams, Charles H.,

Milwaukee, Wisconsin.

HOTELS.**Exchange Hotel,**Adjoining Eastern Railroad Depot,
BUFFALO, N. Y.BY.....**FISK & SPERRY,**
Late of Delevan House, Albany.**J. D. Abraham, Architect,**NO. 300 MAIN STREET,
BUFFALO, N. Y.**Fountain Hotel,**LIGHT STREET, BALTIMORE,
P. THURSTON.....Proprietor.**DUNLAP'S HOTEL,**On the European Plan,
NO. 135 FULTON STREET,
Between Broadway and Nassau St.,
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P. DORSHIMER, BUFFALO.**GUY'S****United States Hotel,**(Opposite Pratt street Railroad Depot),
BALTIMORE.

JOHN GUY. WILLIAM GUY.

American Hotel,Pratt street, opposite the Railroad Depot,
BALTIMORE.HENRY M. SMITH.....Proprietor.
Late of the Exchange & St. Charles Hotels, Pittsburg.**Washington Hotel,**BY JOHN GILMAN,
\$1 Per Day.
No. 206 Pratt street, (near the Depot),
BALTIMORE.**Barnum's City Hotel,**

MONUMENT SQUARE, BALTIMORE.

This Extensive Establishment, erected expressly for a Hotel, with every regard to comfort and convenience, is situated in the centre and most fashionable part of the city, and but a few minutes' walk from the Railroad Depots and Steamboat Landings.

The House has lately undergone a thorough repair, embracing many valuable improvements, and will accommodate 250 Guests. BARNUM & CO.

JONES' HOTEL,NO. 152 CHESTNUT STREET,
PHILADELPHIA.

BARNUM & WATSON, Proprietors.

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Are prepared to execute all kinds of Lithography in good style and at reasonable rates. Particular attention will be paid to Engraving Railroad Maps, Engineer's Plans and drafts, etc., and orders in this line are respectfully solicited.

Cumberland, (Md.) Coals for Steaming, etc.ORDERS RECEIVED FOR AND FILLED
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218 PEARL ST., NEW YORK.**Charles T. Jackson, M. D.,**

STATE ASSAYER, late Geologist to Maine, Rhode Island, New Hampshire, and the United States, offers his services to his friends and the public in making any Chemical, Mineralogical or Geological researches that may be required for the improvement of Agriculture and the Manufacturing Arts. Particular attention will be paid to the exploration of mines and to assaying of ores of the metals.

State Assayer's office, 31 Somerset st.
Boston Sept. 3, 1850.**STEEL AND FILES.****R. S. Stenton,**

20 CLIFF STREET, NEW YORK,

AGENT FOR

J. & RILEY CARR,BAILEY-LANE WORKS, SHEFFIELD,
Manufacturers of Cast, Shear, German, Blister, and
Spring Steel,

Of all descriptions, Warranted Good.

FILES.

Manufacturers of Machinists' Warranted Best Cast Steel Files, expressly for working upon Iron and Steel, made very heavy for recutting.

A full Stock of Steel and Files at all times on hand. 6m4

Walter R. Johnson,

CIVIL AND MINING ENGINEER AND ATTORNEY for Patents. Office and Laboratory, F St., opposite the Patent office, Washington, D. C.

Dudley B. Fuller & Co.,IRON COMMISSION MERCHANTS,
No. 139 GREENWICH STREET,
NEW YORK.**Manning & Lee,**GENERAL COMMISSION MERCHANTS,
NO. 51 EXCHANGE PLACE,
BALTIMORE.Agents for Avalon Railroad Iron and Nail Works.
Maryland Mining Company's Cumberland Coal 'CED'
—'Potomac' and other good brands of Pig Iron.**Samuel Kimber & Co.,**
COMMISSION MERCHANTS

WILLOW ST. WHARVES, PHILADELPHIA.

AGENTS for the sale of Charcoal and Anthracite Pig Iron, Hammered Railroad Car and Locomotive Axles, Force Pumps of the most approved construction for Railroad Water Stations and Hydraulic Rams, etc., etc.
July, 27, 1849.**James Herron, Civil Engineer,**OF THE UNITED STATES NAVY YARD,
PENSACOLA, FLORIDA,

PATENTED OF THE

HERRON RAILWAY TRACK.

Models of this Track, on the most improved plan, may be seen at the Engineer's office of the New York and Erie Railroad.

PLUSHES

FOR

Railway Cars & Omnibuses.**F. S. & S. A. MARTINE,**
112 WILLIAM ST., NEAR JOHN.

ARE now receiving a large and complete assortment of Plain and Figured **PLUSHES**, of their own importation, which will be sold at the lowest market price, viz: Crimson, Maroon, Scarlet, Green, Blue, Purple, etc.

ALSO—**CURLED HAIR**, the best manufactured in market.

**To Railroad Companies,
Machinists, Car Man-
ufacturers, etc., etc.**

CHARLES T. GILBERT,
NO. 80 BROAD ST., NEW YORK.

IS prepared to contract for furnishing at manufacturer's prices—
Railroad iron,

Locomotive Engines,
Passenger and Freight Cars,
Car Wheels and Axles,
Chairs and Spikes.

Orders are invited; and all inquiries in relation to any of the above articles will receive immediate attention

**Manufacture of Patent Wire
ROPE AND CABLES,**

For Inclined Planes, Suspension Bridges, Standing Riggering, Mines, Cranes, Derrick, Tillers, &c., by
JOHN A. ROEBLING, Civil Engineer,
TRENTON, N. J.

FORGING.**Ranstead, Dearborn & Co.,**

MANUFACTURERS OF
LOCOMOTIVE CRANKS AND CAR AXLES,

ALSO

WROUGHT IRON SHAFTING,

And All Kinds of Hammered Shapes.
Office 25 Foster's Wharf, Boston.

Samuel D. Willmott;

MERCHANT, AND MANUFACTURER OF
CAST STEEL WARRANTED SAWS,

—AND FILES—

IMPORTER OF THE
GENUINE WICKESLY GRINDSTONES
NO. 8 LIBERTY STREET,
NEW YORK.

Railroad Instruments.

THEODOLITES, TRANSIT COMPASSES,
and Levels, with Fraunhofer's Munich Glasses,
Surveyor's Compasses, Chains, Drawing Instruments,
Barometers, etc., all of the best quality and workmanship,
for sale at unusually low prices, by
E. & G. W. BLUNT,

No. 179 Water St., cor. Burling Slip.
New York, May 19, 1849.

IRON.**Iron.**

Pig Iron, Anthracite and Charcoal; Boiler and Flue Iron,
Spring and Blistered Steel, Nail Rods, Best Refined Bar Iron,
Railroad Iron, Car Axles, Nails, Stove Castings,
Cast Iron Pipes of all sizes, Railway Chairs of approved patterns,
for sale by
COLEMAN, KELTON & CAMPBELL,
109 N. Water St., Philadelphia.

Stickney & Beatty,

DEALERS IN IRON AND IRON
MANUFACTURERS.

AGENTS for the Balt. City Rolling Mill, from which establishment they are prepared to furnish Ellicott's round, square, and flat bar iron, puddled and charcoal boiler plates and billet iron—also agents for the sale of the Laurel, Gunpowder and Locust Grove (Balt.) forge pig irons, Locust Grove and Laurel Irons for car wheels, Caledonian boiler blooms made from cold blast iron, Old Colony and anti-Eatam nails, Wm. Jessop & Son's steel, Coleman's blister steel and nail rods, sheet, hoop, band, oval and common English iron.

Nos. 18 and 20 South Charles st., Baltimore.

Car Wheel Iron.

100 Tons "Columbia" No. 2 Cold Blast Charcoal Iron.
300 Tons "Sallybury" No. 1, do. do.

For sale by **CHARLES T. GILBERT,**
No. 80 Broad st.

New York, Sept. 21, 1850.

Railroad Spikes.

THE subscribers are prepared to make and execute contracts for Railroad Spikes of a superior quality, manufactured by the New Jersey Iron Company, at Boonton.
DUDLEY B. FULLER & CO.
139 Greenwich st. corner of Cedar.

Railroad Iron.

1650 Tons, weighing about 61 lbs. per yard, 40 tons, weighing about 52 lbs. per yard, and 825 tons, weighing about 53½ lbs. per yard, of the latest and most approved patterns of T rail, for sale by
BOORMAN, JOHNSTON & CO.,
119 Greenwich street.

New York, Aug. 26, 1850.

N.B.—B. J. & Co are also prepared to take contracts for English rails, delivered in any of the Atlantic ports of the United States.

Railroad Iron.

THE Undersigned, Agents for Manufacturers, are prepared to contract to deliver Rails of superior quality, and of any size or pattern, to any ports of discharge in the United States.

COLLINS, VOSE & CO.
74 South St.

New York, June 1, 1850.

Railroad Iron.

1,500 Tons weighing 55 lbs. per lineal yard.
500 " " 57 " "
500 " " 56 " "
500 " " 60 & 61 lbs. "

Also 2½ flat rails. All the above being of approved patterns. For sale by
DAVIS, BROOKS, & CO.,
68 Broad street.

N.B.—Rails imported on commission, or at a fixed price.

**Railroad Spikes, Boiler Riv-
ets, etc.**

THE Subscribers, Agents for the sale of James S. Spencer's, Jr., Railroad and Boat Spikes, Boiler Rivets, and Wrought Iron Chairs for Railroads, made at his Works near this city, will execute all orders with promptness, despatch, and of the best quality.

ALSO IMPORTERS of English refined and Merchant bar Iron; Extra refined Car and Locomotive Axles (from 3½ to 6½ inches in diameter); B. O. Locomotive Tire (welded by Baldwin). Also, supply Boiler and Flue Iron cut to pattern or otherwise—Spring, Shear, and Cast Steel, etc., etc.

T. & E. GEORGE.

Philadelphia, November 14, 1850.

Railroad Iron.

THE UNDERSIGNED, HAVING made arrangements abroad, are prepared to contract for the delivery of Foreign rails, of approved brands upon the most favorable terms.

They will also make contracts for American rails, made at their Trenton works, from Andover Iron, in whole or in part, as may be agreed upon.

They are prepared to furnish Telegraph, Spring and Market Wire; Braziers and Wire Rods; Rivets and Merchant Bars to order, all made exclusively from Andover Iron. The attention of parties who require iron of the very best quality for special purposes, is respectfully invited.

COOPER & HEWITT,
17 Burling Slip, New York.

February 15, 1850.

Railroad Iron.

THE Undersigned, Agents for Manufacturers, are prepared to contract for the delivery of English, Welsh and Scotch Rails, of any pattern and weight, also for every description of English, Welsh, Scotch, and Swedish Iron, Railway Chairs and Spikes, Rivets, Bolts, Nuts, Washers, Chain Cables, Anchors, Tin Plates, German Spelter, Iron Castings, and every description of Machinery.

WILLIAM BIRD & CO.,
Iron and Tin Plate Merchants,
44 Wall st., New York.

And at 5 Martin's Lane, City, London,
and 140 Buchanan st., Glasgow.

July 27th, 1850.

Glendon Refined Iron.

Round Iron, Band Iron, Hoop Iron,
Square Flat " Scroll "

Axles, Locomotive Tyres,
Manufactured at the Glendon Mills, East Boston, for
sale by **GEORGE GARDNER & CO.,**
5 Liberty Square, Boston, Mass.

Sept. 15, 1849. 3m37

PATENT HAMMERED RAILROAD, SHIP & BOAT SPIKES.—The Albany Iron Works have always on hand, of their own manufacture, a large assortment of Railroad, Ship and Boat Spikes from 2 to 12 inches in length, and of any form of head. From the excellence of the material always used in their manufacture, and their very general use for railroads and other purposes in this country, the manufacturers have no hesitation in warranting them fully equal to the best spikes in market, both as to quality and appearance. All orders addressed to the subscribers at the works will be promptly executed.

JOHN F. WINSLOW, Agent.

Albany Iron and Nail Works, Troy, N. Y.
The above Spikes may be had at factory prices, of
Erastus Corning & Co Albany; Merritt & Co., New York; E. Pratt & Brother, Baltimore, Md.

**LAP—WELDED
WROUGHT IRON TUBES**

FOR

TUBULAR BOILERS,

FROM ONE AND A QUARTER TO SEVEN
INCHES IN DIAMETER.

THE ONLY Tubes of the same quality and manufacture as those so extensively used in England, Scotland, France and Germany, for Locomotive, Marine and other Steam Engine Boilers.

THOMAS PROSSER & SON, Patentees,
28 Platt street, New York.

Railroad Iron.

THE UNDERSIGNED ARE PREPARED TO contract for the delivery of English Railroad Iron of favorite brands, during the Spring. They also receive orders for the importation of Pig, Bar, Sheet, etc. Iron.

THOMAS B. SANDS & CO.,
73 New street,
New York.

February 3, 1849.

Iron Store.

THE Subscribers, having the selling agency of the following named Rolling Mills, viz: Norristown, Rough and Ready, Kensington, Triadelphia, Port-grove and Thorndale, can supply Railroad Companies, Merchants and others, at the wholesale mill prices for bars of all sizes, sheets cut to order as large as 58 in diameter; Railroad Iron, domestic and foreign; Locomotive tire welded to given size; Chairs and Spikes; Iron for shafting, locomotive and general machinery purposes; Cast, Shear, Blister and Spring Steel; Boiler rivets; Copper; Pig iron, etc., etc.

MORRIS, JONES & CO.,

Iron Merchants,

Schuylkill 7th and Market Sts., Philadelphia.
August 16, 1849. 1y33

Railroad Iron.

THE MOUNT SAVAGE IRON WORKS, Alleghany county, Maryland, having recently passed into the hands of new proprietors, are now prepared, with increased facilities, to execute orders for any of the various patterns of Railroad Iron. Communications addressed to either of the subscribers will have prompt attention.

J. F. WINSLOW, President

Troy, N. Y.

ERASTUS CORNING, Albany

WARREN DELANO, Jr., N. Y.

JOHN M. FORBES, Boston.

ENOCH PRATT, Baltimore, Md

November 6, 1848.

Railroad Iron.

THE SUBSCRIBERS ARE PREPARED TO take orders for Railroad Iron to be made at their Phoenix Iron Works, situated on the Schuylkill River, near this city, and at their Safe Harbor Iron Works, situated in Lancaster County, on the Susquehanna river; which two establishments are now turning out upwards of 1800 tons of finished rails per month.

Companies desirous of contracting will be promptly supplied with rails of any required pattern, and of the very best quality.

REEVES, BUCK & CO.

45 North Water St. Philadelphia.

March 15, 1849.

Tredegair Iron Works.

ROLLING MILL FOUNDRY AND MACHINE SHOPS. The undersigned continues to manufacture at his Works in this city (from best charcoal metal) Bar Iron of every description, embracing—Rounds and Squares, from $\frac{1}{4}$ to 5 inches diameter. Flats, from $\frac{1}{4}$ to 7 inches, all thicknesses. Bands and Scrolls, all sizes. Boiler plate and Plough Iron. Railroad and Locomotive Axles and Tires. Locomotive Frames, Spikes and Plates. Hoops, Ovals, Half Ovals, Half Rounds, Angle, T, L, and indeed every description of Iron usually manufactured, all of which he warrants to be equal to any made in this country. He also manufactures at his Foundry and Machine Shops all descriptions of Railroad Work, say, Locomotives, Railroad Wheels and Axles complete and ready for the road, Railroad Chairs, etc. Also, Marine and Stationary Engines all sizes, Sugar mills and Engines, Horse mills, and every kind of Machinery usually required for the operations of the country. He has paid particular attention to getting up machinery, etc., for Gold Mine operations, and those in want of such work might find it to their advantage to give him a call.

J. R. ANDERSON.

Richmond, Va., Sept. 10, 1850.

CUT NAILS OF BEST QUALITY, BAR IRON (including Flat Rail) manufactured and for sale by
FISHER, MORGAN & CO.,
75 N. Water St., Philadelphia.

Wheel, Forge and Foundry Iron.

LOCUST GROVE Wheel Iron of great strength and superior chilling property.
Balt. Charcoal Forge Iron, from Patuxent, Curtis Creek and Gunpowder furnaces.
Elkridge Foundry Iron, of superior strength and softness. Anthracite and Charcoal Iron from Pennsylvania and Virginia. Gas and Water Pipes, Lamp Posts from Elkridge furnace.

LEMMON & GLENN,

Sm9 62 Buchanan's Wharf, Baltimore.

S. S. Keyser & Co., IRON WAREHOUSE,

Corner of South and Pratt Streets, BALTIMORE, MD.

Selling Agents for the Rough and Ready Bar Iron and Elk Boiler and Flue Iron Rolling Mills, Sarah and Taylor Furnaces, and Wrightsville Hollow Ware Foundry, and Dealers in Bar and Sheet Iron, and Cast, Sheer, German, Blister, Spring and Electroplated Steel, etc., etc.

Smith & Tyson,

GENERAL COMMISSION MERCHANTS, No. 25 South Charles St., Baltimore, Md.

AGENTS for the Celebrated Columbia Pig Iron, suitable for Car Wheels and Chilled Rolls.
Columbia refined Charcoal Blooms; Refined Charcoal Juniata Billet Iron for Wire; Refined Iron for Bridging, of great strength; Cut Nails, Spikes, and Brads; Railroad Spikes and Wrought Chairs. 22tf

Railroad Iron.

CONTRACTS made by the subscribers, agents for the manufacturers, for the delivery of Railway Iron, at any port in the United States, at fixed prices, and of quality tried and approved for many years, on the oldest railways in this country.

RAYMOND & FULLERTON, 45 Cliff St.

JOHNSON, CAMMELL & Co's Celebrated Cast Steel,

AND ENGINEERING AND MACHINE FILES, which for quality and adaptation to mechanical uses, have been proved superior to any in the United States. Every description of square, octagon, flat and round cast steel, sheet, shovel and railway spring steel, best double and single shear steel, German steel, flat and square, goat stamps, etc. Saw and file steel, and steel to order for any purposes, manufactured at their Cyclops Steel Works Sheffield.

JOHNSON, CAMMELL & CO.,

100 William St., New York.

November 23 1849.

Bowling Tire Bars.

40 Best Flange Bars 5 $\frac{1}{2}$ x2 inches, 11 feet long.
40 " " 5 $\frac{1}{2}$ x2 " 7 feet 8 in. long.
40 " Flat " 6x2 " 11 feet long.
40 " " 6x2 " 7 feet 8 in. long.

Now in store and for sale by

RAYMOND & FULLERTON,
45 Cliff street.

IRONDALE PIG METAL, MANUFACTURED and for sale by the Bloomsburg Railroad Iron Co.
LINDLEY FISHER, Treasurer.
75 N. Water St., Philadelphia.

Railroad Iron.

2000 Tons, weighing 58 pounds per lineal yard, of the most approved pattern of T rails, in store and to arrive, for sale by
COLLINS, VOSE & CO.,
74 South St.

New York, June 1, 1850.

Railroad Iron.

3,000 TONS C. L. MAKE 63 $\frac{1}{2}$ lbs. per yard, now landing and to arrive.
Also contracts made for future delivery of above superior make English Iron.

300 Tons Banks Best Iron, Round, Square and Flat.
200 " English Bar " " " "
10 " 9-16 Square Iron for Railroad Spikes.

For sale in lots to suit purchasers by
DAVID W. WETMORE.

New York, March 26, 1850. 3m

WILLIAM JESSOP & SONS' CELEBRATED CAST-STEEL.

The subscribers have on hand, and are constantly receiving from their manufactory,

PARK WORKS, SHEFFIELD,

Double Refined Cast Steel—square, flat and octagon.
Best warranted Cast Steel—square, flat and octagon.
Best double and single Shear Steel—warranted.
Machinery Steel—round.

Best and 2d gy. Sheet Steel—for saws and other purposes.

German Steel—flat and square, "W. I. & S." "Eagle" and "Goat" stamps.

Genuine "Sykes," L Blister Steel.

Best English Blister Steel, etc., etc., etc.

All of which are offered for sale on the most favorable terms by
WM. JESSOP & SONS,
91 John street, New York.

Also by their Agents—

Curtis & Hand, 47 Commerce street, Philadelphia.

Alex'r Fullerton & Co., 119 Milk street, Boston.

Stickney & Beatty, South Charles street, Baltimore.

May 6, 1848.

Railroad Iron.

B. O. Railway Tires, Railway Wheels,
Scotch Pig Iron, Tin Plates and Banca Tin,
Muntz Patent Metal Sheathing,
Baltimore Copper.

Contracts for Rails made on behalf of the manufacturers, for delivery at any ports in the United States, at fixed prices.

Bowling Tires and Tire Bars and Scotch Pigs imported to order.

Muntz's Ship-sheathing, and a general stock of Tin Plates and Banca Tin in store, and for sale by
RAYMOND & FULLERTON, 45 Cliff St.

Bowling Iron. Stamped B.O.

Railway Tire Bars Rivet Iron
Locomotive and other Axles Locomotive Frame do
Boiler Plates Bars,
and every other description of this superior Iron.

The subscribers, agents for the sale of Bowling Iron, are prepared to execute orders for importation, especially for railway and machinery uses, with despatch from the manufacturers.

RAYMOND & FULLERTON, 45 Cliff St.

Lovegrove's Patent Cast Iron Water and Gas Pipes.

THE Subscriber, the Inventor and Patentee of the Centrifugal mode of giving form to metallic substances while in a molten state, is preparing to make Cast Iron Water and Gas Pipes, of any dimensions, at prices much lower than they can be made in the old manner, and the pipes warranted to stand a pressure of three hundred pounds to the square inch, and to be soft enough to drill. Steam Engines and all kinds of machinery. Cast Iron Doors and Frames, and Mill Castings of every description, made to order.

THOMAS J. LOVEGROVE,

Machinist and Founder,

West Falls Avenue, below Pratt St., Baltimore.

Railroad Iron.**SPIKES.**

Wrought Iron CHAIRS, New Pattern.

THE Undersigned continues to contract, as usual, for the above articles. The reputation already acquired for their excellent quality is a guarantee that strict attention shall continue to be paid to the wants and interests of purchasers.

CHARLES ILLIUS,

20 Beaver St., New York.

Ray's Patent India Rubber Car Springs.

Savannah, Ga., May 22, 1850.

FOWLER M. RAY, Esq.,
Dear Sir: I have no hesitation in saying, after having used on our road your springs and Fuller's, that I consider yours decidedly the best in every particular, and in this opinion I am sustained by all our officers. Fuller's spring has a tendency to split, and also to chafe or abrade by the constant friction on the cast iron plates or disc: and in my opinion is not near so elastic as yours.

Your springs, which have been in use on our road for 12 or 15 months past, and in constant use under both passenger and freight cars, are to all appearances as elastic, sound and good, as when first put in use.

We are now building eighty-five new cars, of which for fifty-sets the springs have been ordered of you.

GEORGE A. ADAMS,

Master Carpenter,

Central Railroad and Banking Co. of Georgia.

Connecticut River Railroad Office, }
Northampton, May 4, 1850. }

E. CRANE, Esq.,

Dear Sir: It is now about two years since I first tried the experiment of using a set of Ray's India-rubber Springs upon one of our merchandise cars, and although the car has been in constant service since that time, I do not on examination find the slightest difference either in the thickness or elasticity of the material.

The same result has followed wherever we have applied them, either for wheel or draw springs on Engines, Tenders or Cars. At present we use no other; either in replacing old springs or building new cars—and I am perfectly satisfied that for economy, durability, safety, and ease of motion, that Ray's India-rubber is the best article for Springs which has been presented to the public.

Yours respectfully, J. HUNT,
Supt. Connecticut River Railroad.

EDWARD CRANE, Esq.,

Dear Sir: Having applied to cars of the Boston and Worcester Railroad Corporation, Ray's Vulcanized Rubber Springs (where they have been in use for some two years last past), I have had occasion to observe their operation, and am free to say in answer to your inquiries, that they retain their elasticity perfectly during all changes of atmospheric temperature: and are in my opinion a most valuable acquisition to Railroad Cars—are not liable to derangement, as is the case with steel springs; while at the same time it costs less to apply them. Respectfully yours,

D. N. PICKERING,
Supt. Motive Power, Bos. & Wor. Railroad.
Boston, April 15th, 1850.

EMERSON'S

PATENT

CORRESPONDING
VENTILATORS,

For Ships, Steamers, etc.,

Manufactured by

CHILSON, ALLEN, WALKER & CO.,
351 Broadway, New York.

TO RAILROAD COMPANIES, CAR MANUFACTURERS, etc.

THE Undersigned hereby gives public notice, that the Commissioner of Patents, pursuant to his decision in relation thereto, on the 8th day of October, 1850, issued to him a Patent for the sole right to manufacture, and exclusive use of the **INDIA RUBBER CAR SPRING**, on account of priority of invention of said Spring.

New York, Oct. 23, 1850.

RAILROAD CAR MANUFACTORY

TRACY & FALES,

GROVE WORKS, HARTFORD, CONN.

Passage, Freight and all descriptions of

RAILROAD CARS,

AS WELL AS

LOCOMOTIVE TENDERS,

Made to order promptly.

The above is the Largest Car Factory in the Union. In quality of Material, and in Workmanship, Beauty and Good Taste, as well as Strength and Durability, we are determined our work shall be unsurpassed.

JOHN R. TRACY. THOS. J. FALES.

Monument Foundry.

A. & W. DENMEAD & SON,
Corner of North and Monument Sts.,—Baltimore.
HAVING THEIR
IRON FOUNDRY AND MACHINE SHOP
In complete operation, are prepared to execute
faithfully and promptly, orders for
Locomotive or Stationary Steam Engines,
Woolen, Cotton, Flour, Rice, Sugar Grist, or Saw
Mills,
Slide, Hand or Chuck Lathes,
Machinery for cutting all kinds of Gearing.
Hydraulic, Tobacco and other Presses,
Car and Locomotive patent Ring Wheels, war-
ranted,
Bridge and Mill Castings of every description,
Gas and Water Pipes of all sizes, warranted,
Railroad Wheels with best faggotted axle, fur-
nished and fitted up for use, complete
Being provided with Heavy Lathes for Bor-
ing and Turning Screws, Cylinders, etc., we can
furnish them of any pitch, length of pattern.
Old Machinery Renewed or Repaired—and
Estimates for Work in any part of the United States
furnished at short notice.
June 8, 1849.

**RAILROAD CAR
AND COACH TRIMMINGS.**

Doremus & Nixon,
IMPORTERS AND FURNISHERS

HAVE FOR SALE

Plain Garnet Plush. Fig. Garnet Plush (Butterfly pat.
"Crimson" "Crimson" (Elegant.
"Scarlet" " " " (Gen. Taylor.

BROCATELLES.

Crimson Silk Brocatelles. Gold and Maroon do.
Gold and Blue " " Brown "
Silk and Wool " of every color.

MOQUETTES,

Of elegant designs and colors.

GERMAN CLOTH FOR CAR LININGS.

The most beautiful goods ever shown in this coun-
try, and the subscribers are the sole agents for the sale
of them.

Oil cloths Enamelled with Gold. These goods can be
" " Silver. furnished in any
Do. Silver ground velvet printed. dimensions req'd.

CURLED HAIR

Of every description and quality.

JNO. W. A. STRICKLAND, Agent.
New York, 1850. 1yl6

**FOWLER M. RAY'S
Patent India-rubber Railroad
CAR SPRING.**

New York and Erie Railroad Shops,
Piermont, March 26, 1850.

This will certify that from practical experience in
the use of Fowler M. Ray's India rubber Car Springs,
I believe them to be far superior to any others now in
use.

I have never known them to be affected by any
change of temperature, as other Rubber Springs have
been affected on this road.

I am at the present time repairing a Passenger Car
that Mr. Ray and myself mounted with his springs
about two years and eight months since.

The springs are at the present time as perfect, to all
appearances, as when first applied to the car.

Respectfully yours,

HORACE B. GARDNER,
Foreman of the Car Shops.

Supt. Office N.Y. & H. R.R., }
New York, March 8, 1850.

This is to certify that we have used the Rubber
Springs manufactured by Mr. F. M. Ray for the past
twenty months, "both for Passenger and Freight Car
Springs and Bumpers, and of different sizes," and
have in every case given entire satisfaction, and I con-
sider them the best spring now in use

M. SLOAT, Supt.

Boston, March 5, 1850.

In answer to your enquiry about India-rubber
Springs, I have to say that we have used them to a
considerable extent on both freight and passenger cars,
and also on several of our tenders; and I am very
well satisfied that they answer all the purposes for
which they are intended. I believe the India-rubber
will soon supersede all other springs for cars and ten-
ders.

Yours truly,

S. M. FELTON,
Supt. Fitchburg Railroad.

Office New Jersey Railroad Co., }
Jersey City, March 8, 1850. }

FOWLER M. RAY, Esq.,

Dear Sir: In answer to your enquiries respecting
the operation of the Vulcanized Rubber Springs, pur-
chased by our company from you some two years
since, I reply that they are superior to any spring in
use, (that I have either seen or heard of).

The improved form of your spring, consisting of a
solid piece of vulcanized rubber with bands on the out-
side, is far superior to your first form, consisting of
disks of rubber with metallic plates interposed.

The last named form was tried, if you recollect, at a
much earlier period; and then was replaced by your
last form.

I have no hesitation in saying that your springs
have given entire satisfaction, and most cheerfully re-
commend them to railroad companies throughout the
country for the following reasons:

- 1st. The cost is 30 per cent. less.
- 2d. Saving of weight on each car of 8 wheels from
700 to 800 lbs.
- 3d. Less care and attention is required, as they are
not liable to get out of repair.
- 4th. A great saving is secured in the wear and tear
of the cars and rails from their great elasticity.
- 5th. The freedom from noise.
- 6th. There is greater safety in case of accident, as
they cannot be broken.
- 7th. The comfort of passengers is enhanced suffi-
ciently to pay the expense, waiving all the other rea-
sons that I have given.

Should this fail to satisfy any person enquiring, you
are at liberty to refer to me, No. 150 Washington St.,
Jersey City. Yours respectfully,
T. L. SMITH, Supt.

New York, March 11, 1850.

I have used the Patent India-rubber Spring pur-
chased of Mr. Ray, upon the cars of the New York
and New Haven Railroad, and have found them effi-
cient and economical; and when applied to the axles
and draw springs, believe them to be quite equal to
any in use. I have found a combination of these
springs with a steel spring under the transom beam a
very satisfactory arrangement, and am now using this
plan in all new cars.

Yours respectfully,
ROBERT SCHUYLER.

February 25, 1850.

From practical observation of the use of the India-
rubber Car Springs, manufactured and sold by your
company, we are entirely satisfied in their application,
and do not hesitate to recommend them as elastic, du-
rable, requiring no repairs for years, and retaining
their consistency during all extremes of weather. We
have applied them for the past two years, and consid-
er them superior for all railroad purposes.

Yours truly,

OSGOOD BRADLEY, Car Builder, Worcester.
T. & C. WASON, do. Springfield.
DEAN, PACKARD & MILLS, do. do.
DAVENPORT & BRIDGES, do. Cambridgeport.

Office of the New Jersey Railroad Co., }
Jersey City, March 7, 1850. }

This is to certify that we have had Mr. F. M. Ray's
India-rubber Springs in constant use under our cars,
and as Bumper Springs for upwards of two years, and
they have in every way given perfect satisfaction.

The present form of spring we deem far superior to
the form of Disk, having used both forms, although
we have none of those made in Disks at present in use.

We take pleasure in recommending these springs to
all railroad companies.

J. P. JACKSON, Vice Pres.
New Jersey Railroad and Trans. Co.

Roxbury, February 23, 1850.

In compliance with your request, I take great plea-
sure in stating the result of my experience in the use
of "Ray's Patented Vulcanized India-rubber Car and
Engine Springs." We have used them nearly two
years, and never had one fail in any way. The cold
weather does not affect them, as it has other rubber
springs we have used.

With sixteen years' experience as superintendent of
machinery on the Boston and Providence railroad, I
take pleasure in saying that your springs are the best
we ever used, or I ever saw used elsewhere. We have
20 cars rigged with them, of which I can say that the
springs are as good now as when first applied. I put
24 lbs. of the rubber under the forward end of one of
our heaviest engines, taking off 250 lbs. of steel springs
—it has been in use 18 months, and is in as good con-
dition now as when first put under the engine.

Very respectfully yours,

GEO. S. GRIGGS,
Supt. of Machinery, Boston and Prov. R.R.

Fall River, February 2, 1850.

In answer to yours of the 20th ult. I would say that
this company has for some 10 or 12 months past been
using "Ray's India-rubber Springs." We have ap-
plied them to both passenger and freight cars with
uniform success. They have invariably preserved
their elasticity and consistency through all the ex-
tremes of weather; and we are now applying them
whenever the steel spring fails. I am well satisfied
that they are particularly adapted for railroad purposes.

Very respectfully yours,

GEO. HAVEN,
Supt. Fall River Railroad.

Jersey City, March 9, 1850.

This is to certify that the present form of Mr. F.
M. Ray's India-rubber Car Spring I consider far su-
perior to the form of Disk, having used both forms.

I take pleasure in recommending these springs to all
railroad companies. **DAVID H. BAKER,**
Foreman of Car Shop of N.J. R.R. & Trans. Co.

Harlem R.R. Depot, }
New York, March 7, 1850.

This is to certify that we have used Mr. F. M. Ray's
India-rubber Springs for over eighteen months, and
find them to be easy and durable, and recommend them
to railroad companies as being superior to anything we
have tried.

J. M. SMART,
Foreman at 42d St. Depot.

Old Colony Railroad Office,
Boston, March 6, 1850.

EDWARD CRANE, Esq.,

President New England Car Co.,

Dear Sir: In compliance with your request I would
state that the Old Colony Railroad Comp'y have had
in use upon their road, India-rubber Springs furnish-
ed by your company, for more than eighteen months
past, during which time they have been extensively
used under Passenger and Freight Cars, Locomotive
Tenders, and for Drawer and Buffering Springs, with
the most perfect success. The elasticity and consis-
tency of the Rubber has never been unfavorably affect-
ed by either extremes of heat or cold—and from the
experience which we have had in the use of Rubber
Springs, I think them well adapted for railroad pur-
poses—and therefore we have for some months past
used Rubber almost exclusively, in all places where
springs are required.

Respectfully yours, etc.,

JAS. H. MOORE,
Supt. O. C. Road.

Troy, February 27, 1850.

We have been using your India-rubber Car Springs
for nearly two years—and we take pleasure in saying
that in our opinion the rubber has to a certain extent
already, and may eventually entirely supersede all
other Springs for Railroad Car purposes. We now
use it entirely for Draw Springs and Bumpers, con-
sidering it better and lighter than steel.

During our two years' experience in the use of it,
we have not known any to lose their elasticity, or fail
in any way; and we cheerfully recommend the rub-
ber for railroad car springs. Very respectfully,
EATON, GILBERT & CO.

Passenger Car Linings.

THE Advertiser continues to make to order the
Enamelled Car Linings which have been so high-
ly approved the last three years, and are now exclu-
sively used by all the Northern Railroads. No pains
are spared to get out new styles, and adapt them to
the tastes of every consumer.

Orders addressed to **CHARLES STODDER,** No.
75 Kilby street, Boston, will have prompt attention.
March 23, 1850. 2m

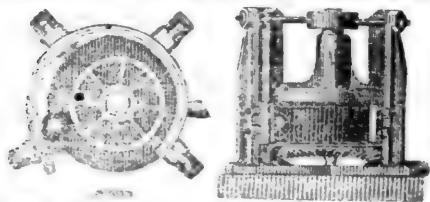
India-rubber for Railroad Cos.

**RUBBER SPRINGS—Bearing and Buffer—Ful-
ler's Patent—Hose from 1 to 12 inches diameter.
Suction Hose. Steam Packing—from 1-16 to 2 in.
thick. Rubber and Gutta Percha Bands. These ar-
ticles are all warranted to give satisfaction, made un-
der Tyer & Helm's patent, issued January, 1849.—
No lead used in the composition. Will stand much
higher heat than that called "Goodyear's," and is in
all respects better than any in use. Proprietors of rail-
roads do not be overcharged by pretenders.**

HORACE H. DAY,
Warehouse 23 Courtlandt street,
New York, May 21, 1849.

Spikes, Spikes, Spikes.

ANY person wishing a simple and effective Spike
Machine, or a number of them, may be supplied
by addressing **J. W. FLACK,**
March 6, 1850. Troy, N. Y.

MACHINERY.**Henry Burden's Patent Revolving Shingling Machine.**

THE Subscriber having recently purchased the right of this machine for the United States, now offers to make transfers of the right to run said machine, or sell to those who may be desirous to purchase the right for one or more of the States.

This machine is now in successful operation in ten or twelve iron works in and about the vicinity of Pittsburgh, also at Phoenixville and Reading, Pa., Covington Iron Works, Md., Troy Rolling Mills, and Troy Iron and Nail Factory, Troy, N. Y., where it has given universal satisfaction.

Its advantages over the ordinary Forge Hammer are numerous: considerable saving in first cost; saving in power; the entire saving of shinglers, or hammerman's wages, as no attendance whatever is necessary, it being entirely self-acting; saving in time from the quantity of work done, as one machine is capable of working the iron from sixty puddling furnaces; saving of waste, as nothing but the scoria is thrown off, and that most effectually; saving of staffs, as none are used or required. The time required to furnish a bloom being only about six seconds, the scoria has no time to set, consequently is got rid of much easier than when allowed to congeal as under the hammer. The iron being discharged from the machine so hot, rolls better and is much easier on the rollers and machinery. The bars roll sounder, and are much better finished. The subscriber feels confident that persons who will examine for themselves the machinery in operation, will find it possesses more advantages than have been enumerated. For further particulars address the subscriber at Troy, N. Y.

P. A. BURDEN.

Railroad Spikes and Wrought Iron Fastenings.

THE TROY IRON AND NAIL FACTORY, exclusive owner of all Henry Burden's Patented Machinery for making Spikes, have facilities for manufacturing large quantities upon short notice, and of a quality unsurpassed.

Wrought Iron Chairs, Clamps, Keys and Bolts for Railroad fastenings, also made to order. A full assortment of Ship and Boat Spikes always on hand.

All orders addressed to the Agent at the Factory will receive immediate attention.

P. A. BURDEN, Agent,
Troy Iron and Nail Factory, Troy, N. Y.

CHILLED RAILROAD WHEELS.—THE UNDERSIGNED are now prepared to manufacture their Improved Corrugated Car Wheels, or Wheels with any form of spokes or discs, by a new process which prevents all strain on the metal, such as is produced in all other chilled wheels, by the manner of casting and cooling. By this new method of manufacture, the hubs of all kinds of wheels may be made whole—that is, without dividing them into sections—thus rendering the expense of banding unnecessary; and the wheels subjected to this process will be much stronger than those of the same size and weight, when made in the ordinary way.

A. WHITNEY & SON,
Willow St., below 13th,
Philadelphia, Pa.

Brown's Old Established SCALE WARE HOUSE,

NO. 234 WATER ST., NEW YORK.

THE Subscriber, Practical Manufacturer of Scales of every description, respectfully asks the attention of Railroad Companies to his Improved Wrought Iron Railroad Track and Depot Scales which for strength, durability, accuracy, convenience in weighing, and beauty of workmanship, are not surpassed by any others in this country.

He is aware that this is rather a bold assertion for him to make, yet he can say with confidence that they have but to be tried to give them precedence over all others.

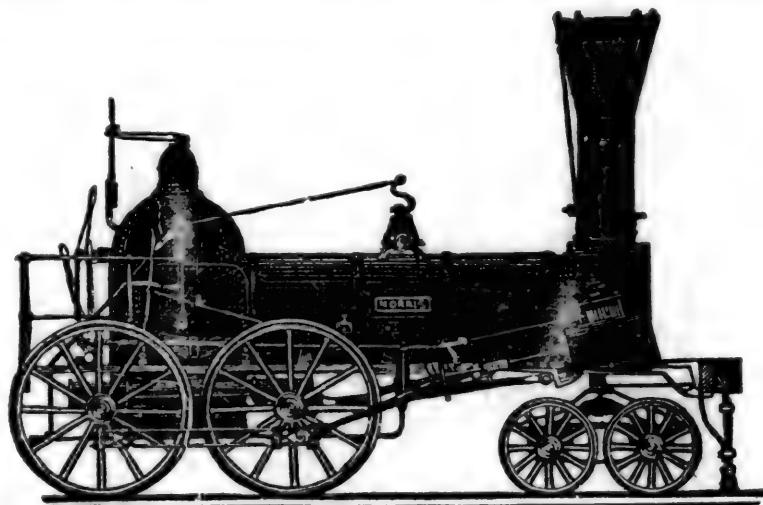
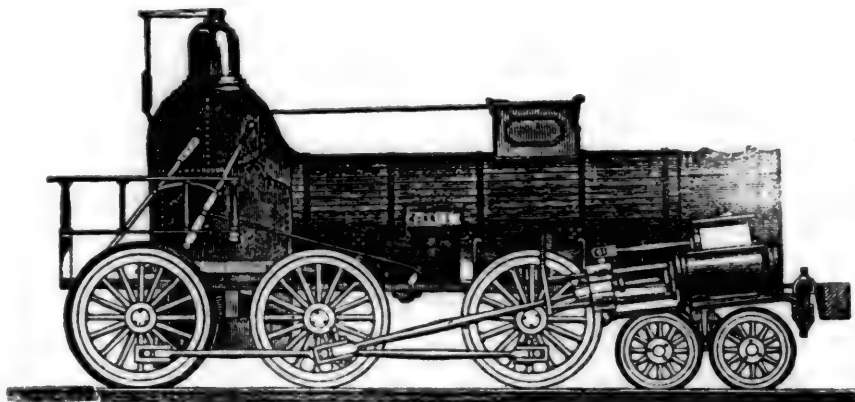
J. L. BROWN.

Bank Scales made to order, and all Scales of his make Warranted in every particular.

References given if required

NORRIS' LOCOMOTIVE WORKS.

BUSHHILL, SCHUYLKILL SIXTH-ST., PHILADELPHIA,



THE UNDERSIGNED Manufacture to order Locomotive Steam Engines of any plan or size. Their shops being enlarged, and their arrangements considerably extended to facilitate the speedy execution of work in this branch, they can offer to Railway Companies unusual advantages for prompt delivery of Machinery of superior workmanship and finish.

Connected with the Locomotive business, they are also prepared to furnish, at short notice, Chilled Wheels for Cars of superior quality.

Wrought Iron Tyres made of any required size—the exact diameter of the Wheel Centre, being given, the Tyres are made to fit on same without the necessity of turning out inside.

Iron and Brass castings, Axles, etc., fitted up complete with Trucks or otherwise.

NORRIS, BROTHERS

PATENT MACHINE MADE HORSE-SHOES.

The Troy Iron and Nail Factory have all ways on hand a general assortment of Horse Shoes, made from Refined American Iron.

Four sizes being made, it will be well for those ordering to remember that the size of the shoe increases as the numbers—No. 1 being the smallest.

P. A. BURDEN, Agent,
Troy Iron and Nail Factory, Troy, N. Y.

Etna Safety Fuse.

THIS superior article for igniting the charge in wet or dry blasting, made with DUPONT'S best powder, is kept for sale at the office and depot of

REYNOLDS & BROTHER,

2 So. 6 Manufacturers, N.Y.
No. 85 Liberty St.
NEW YORK.

And in the principal cities and towns in the U. States.

The Premium of the AMERICAN INSTITUTE was awarded to the Etna Safety Fuse at the late Fair held in this city.

November 3, 1849.

1y

COLUMBUS, OHIO, Railroad Car Manufactory. RIDGWAYS & KIMBALL,

HAVE established at this central point, the manufacture of Passenger, Freight, Gravel and Hand Cars for Railroads, and assure all Western Railroad Companies that it will be their constant aim to procure the best materials and workmen, and to turn out the best kind of work at fair prices. Specimens may be seen on the Columbus and Xenia Railroad. The patronage of Railroad Companies is respectfully solicited.

1y8

FOR SALE.

THREE LOCOMOTIVES, Manufactured by M. W. Baldwin, of 10 tons weight, all in complete repair, and now running on the Columbia and Philadelphia Railroad.

For particulars apply to A. L. Roumfort, Supt. of said road, either at Philadelphia, or Parkersburg, Chester county.

A. L. ROUMFORT,
Supt. Motive Power Col. & Philad. R.R.

AMERICAN RAILROAD JOURNAL.

STEAM NAVIGATION, COMMERCE, MINING, MANUFACTURES.

HENRY V. POOR, Editor.

ESTABLISHED 1831.

PUBLISHED WEEKLY, AT No. 136 NASSAU ST., NEW YORK, AT FIVE DOLLARS PER ANNUM IN ADVANCE
SECOND QUARTO SERIES, VOL. VI., No. 52. SATURDAY, DECEMBER 28, 1850 [WHOLE No. 767 VOL. XXIII.]

ASSISTANT EDITORS,

J. T. HODGE, *For Mining and Metallurgy.*
GEN. CHAS. T. JAMES, *For Manufactures and the Mechanic Arts.*

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Saturday, December 28, 1850.

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Virginia Manufactures.

The Reports of the Committee of the Manufacturers' Convention, recently held at Richmond, do not present the condition of the manufacturing interests of this State in a very flattering light. The committee appointed to inquire into the condition of the iron manufacture, reported, that although the present capacity of the mountain works near the James river, now established, is equal to the production of at least 25,000 tons of pig iron annually, their production the present year does not exceed 9,000 tons, and is not likely to exceed 2,500 tons for the year ensuing.

This decline in the amount of iron produced is in the face of greatly reduced cost of transportation. The James River canal is now opened to Lynchburg, and is soon to be opened to Buchanan, the centre of the iron manufacture in this part of Virginia, affording a cheap and expeditious means of sending to a market. Certainly, if charcoal iron

can be made in any part of the country to profit, it can in Virginia.

The committee also state that there are in Virginia 50 blast furnaces, capable of producing yearly 54,500 tons of pig iron, which now are not producing more than 11,700 tons. Estimating each of these furnaces to have cost \$20,000—which is a very low estimate—we have an amount of one million of dollars. At \$25 per ton for pig iron—which is a low price—these furnaces would produce to the State the sum of \$1,362,500. Their product this year will not exceed \$300,000. Their product next year will be very much smaller.

Of the four rolling mills, two have stopped, one is doing not more than third work, and the fourth employed in the manufacture of nails is subjected to the depression of that business, resulting from other mills established for different purposes, being driven into that manufacture as the only one safe from foreign competition, and so producing a glut of the nail market.

The committee further state, that while the government during the last year has gained some \$40,000 of additional income by the increased importation of foreign coal, under the tariff of 1846, Virginia has lost on her present inconsiderable coal trade alone, at least \$200,000 by diminished production. She has lost, in addition, the profit which would accrue to her works of internal improvement from the carriage of the additional quantity of coal.

Virginia with an area of coal measures of not less than 21,000 square miles, much of which lies on or near navigable waters, and is capable of yielding all the varieties of British coal, and of equal quality, is reduced to the actual production of less than 200,000 tons, of the value of \$600,000. Great Britain, with little more than half the extent of coal measures, produces annually 37,000,000 tons, of about the value of \$37,000,000 at the mines, and \$80,000,000 at the markets of sale.

Lead also exists, and has been mined to some extent in the county of Wythe, but the production is now confined to the wants of the immediate neighborhood, but could be increased to an adequate extent.

Copper ores also are found in several counties and may hereafter, by the encouragement of the copper manufactories of the country furnishing a market for them, become a source of much wealth, besides adding immensely to the consumption of

coal. The consumption of copper in the United States now amounts to upwards of \$3,000,000 per annum, about one third of which is imported from England in sheets.

The cotton and woollen mills are in no more thriving condition than the mining interests.—There are now in that State 20 companies, incorporated and private, engaged in the manufacture of cotton, with an aggregate capital of \$1,800,000. When in full operation, these companies employ about 54,000 spindles, producing generally coarse yarns, and sold as such, or are converted into shirtings, sheetings and osnaburgs. There is not a single factory designed for the production of yarns of a higher number than No. 20.

For many months past these have not been in full operation. At present about 7000 spindles are running three-fourths of the time.
8000 " " one-third "
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Working short time	18
Working full time	2
Entirely idle	8

28

The total production less than half the capacity of the mills.

Woolen Factories in Maryland—Franklin mills, at work; Calverton mills, working half time.

In Virginia there are 10 woolen factories, running 30 sets of machinery, with a capital of \$275,000. A portion of these are idle, and it is stated that the whole are working without profit.

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Working short time.....	12
Working full time.....	2
Entirely idle.....	34

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Woollen Factories in Maryland—Franklin mills, at work; Calverton mills, working half time.

In Virginia there are 10 woollen factories, running 30 sets of machinery, with a capital of \$275,000. A portion of these are idle and it is stated that the whole are working without profit.

There are now manufactured in Virginia about 3,500,000 bushels of salt. Of this amount 3,000,000 are made at the Kanawha Springs, and the balance in Washington and Wythe counties.

Such is represented to be the condition of the leading manufacturing interests of Virginia by those engaged in them, and who, of course, possess the best means of judging. There can scarcely be found, in any part of the world, an equal extent of country, so rich in minerals of the most valuable kind, as Virginia. With all these riches she enjoys extraordinary commercial advantages, and means of forwarding her products to a market.— Yet with all these advantages, her minerals have nearly ceased to be worked; and every branch of manufacturing seems to be drying up. Certainly something is out of joint, or such an anomalous state of things could not be presented as the one which we witness here.

Statistics Accompanying the Treasurer's Report.

A statement exhibiting the value of certain articles imported during the years ending on the 30th June, 1844, 1845, 1846, 1848, 1849 and 1850, (after deducting the re-exportations) and the amount of duty which accrued in each during the same periods respectively.

	Value.	Duties.
Woolens.....	9,408,279	3,313,495
Cottons.....	13,236,830	4,850,731
Hempen goods.....	865,427	213,861
Iron and manuf. of.....	2,395,860	1,607,113
Sugar.....	6,897,245	4,597,093
Hemp unmanuf.....	261,913	101,338
Salt.....	892,112	654,881
Coal.....	203,681	133,845
Total dollars.....	34,161,247	15,472,358

	Value.	Duties.
Woolens.....	10,504,423	3,731,014
Cottons.....	13,360,729	4,908,272
Hempen goods.....	801,661	198,642
Iron and manuf. of.....	4,075,142	2,415,003
Sugar.....	4,019,708	2,555,075
Hemp unmanuf.....	140,372	55,122
Salt.....	883,359	678,069
Coal.....	187,962	130,221
Total dollars.....	34,003,356	14,671,418

	Value.	Duties.
Woolens.....	9,935,925	3,480,797
Cottons.....	12,857,422	4,865,483
Hempen goods.....	696,888	138,394
Iron and manuf. of.....	3,660,631	1,629,581
Sugar.....	4,397,239	2,713,866
Hemp unmanuf.....	180,221	62,282
Salt.....	748,566	509,244
Coal.....	336,691	254,149
Total dollars.....	32,813,538	13,653,796

	Value.	Duties.
Woolens.....	15,061,102	4,196,007
Cottons.....	17,205,417	4,166,673
Hempen goods.....	606,900	121,380
Iron and manuf. of.....	7,060,473	2,118,141
Sugar.....	8,775,220	2,632,567
Hemp unmanuf.....	180,335	54,100
Salt.....	1,027,656	205,531
Coal.....	426,997	128,099
Total dollars.....	50,344,100	13,022,498

	Value.	Duties.
Woolens.....	13,505,720	3,726,989
Cottons.....	15,182,518	3,769,294
Hempen goods.....	460,835	92,067
Iron and manuf. of.....	9,189,743	2,656,923
Sugar.....	7,576,303	2,272,891
Hemp unmanuf.....	478,232	143,470
Salt.....	1,424,529	284,906
Coal.....	387,370	116,211
Total dollars.....	48,204,750	13,162,751

	Value.	Duties.
Woolens.....	16,900,916	4,682,457
Cottons.....	19,635,936	4,898,475
Hempen goods.....	590,232	104,046
Iron and manuf. of.....	16,232,018	4,896,604
Sugar.....	6,332,068	1,899,620
Hemp unmanuf.....	574,783	172,435
Salt.....	1,287,518	245,504
Coal.....	361,855	108,557
Total dollars.....	61,835,321	16,980,698

Statement exhibiting the aggregate value of breadstuffs and provisions exported annually from 1821 to 1850 inclusive.

Years ending.	Breadstuffs & provisions.	Value.
September 30th	1821.....	12,841,901
"	1822.....	13,886,856
"	1823.....	13,767,847
"	1824.....	15,059,484
"	1825.....	11,634,449
"	1826.....	11,303,496
"	1827.....	11,685,556
"	1828.....	11,461,144
"	1829.....	13,131,858
"	1830.....	12,075,430
"	1831.....	17,538,227
"	1832.....	12,424,703
"	1833.....	14,209,128
"	1834.....	11,524,024
"	1835.....	12,009,399
"	1836.....	10,614,130
"	1837.....	9,588,359
"	1838.....	9,636,650
"	1839.....	14,147,779
"	1840.....	17,067,535
"	1841.....	17,196,102
"	1842.....	16,902,876
9m end. June 30	1843.....	11,204,123
Year.	1844.....	17,970,135
"	1845.....	16,743,421
"	1846.....	27,701,121
"	1847.....	68,701,921
"	1848.....	37,472,751
"	1849.....	39,155,507
"	1850.....	26,051,373
Total.....		\$535,207,285

Statement of the annual expenses of the government, exclusive of the payments on account of the public debt, of trust funds, and of the collection of the revenue, from the 1st January, 1828, to 31st December, 1845.

Years.	Expenditure.
From 1st Jan. to 31st Dec.	1828.....12,530,846 43
"	1829.....12,632,321 84
"	1830.....13,229,533 33
"	1831.....13,863,786 13
"	1832.....16,514,134 69
"	1833.....22,044,237 31
"	1834.....18,410,392 10
"	1835.....17,005,418 55
"	1836.....29,358,902 16
"	1837.....31,505,680 18
Average annual increase of expenditure from 1828 to 1841.	\$943,923 56.....187,095,253 73
"	1838.....31,468,839 04
"	1839.....25,410,050 67
"	1840.....25,249,626 95
"	1841.....25,745,776 94
"	105,874,282 94
From 1st Jan. to 30th June.	1842.....12,888,228 63
From 1st July, 1842. to June 30.	1843.....22,724,205 78
From 1st July, 1843. to June 30.	1844.....19,835,793 48
From 1st July, 1844. to June 30.	1845.....31,273,705 67
From 1st July to 31st Dec.	1845.....15,237,713 58
Average annual expenditure	\$22,987,411 78

A Statement exhibiting the amount of coin and bullion imported and exported annually, from 1821 to 1850, inclusive; and, also, the amount of importation over exportation and of exportation over importation during the same years.

	Imported.	Exported.	Importation over exportation.	Exportation over importation.
Year ending 30th Sept.				
1821	8,064,890	10,478,059		2,413,169
1822	3,369,846	10,810,180		7,440,334
1823	5,097,896	6,372,937		1,275,091
1824	8,379,835	7,014,552	1,365,283	
1825	6,150,765	8,797,055		2,646,290
1826	6,880,966	4,704,533	2,176,433	
1827	8,151,130	8,014,880	136,250	
1828	7,189,741	8,243,476		753,735
1829	7,403,612	4,924,020	2,479,592	
1830	8,155,964	2,173,773	5,977,191	
1831	7,305,945	9,014,931		1,708,936
1832	5,907,504	5,656,340	251,174	
1833	7,070,368	2,611,701	4,458,667	
1834	17,911,632	2,076,758	15,834,874	
1835	13,131,447	6,477,775	6,653,672	
1836	13,400,831	4,324,336	9,076,545	
1837	10,516,414	5,976,249	4,540,165	
1838	17,747,116	3,508,046	14,239,070	
1839	5,595,176	8,776,743		3,181,567
1840	8,882,813	8,417,014	465,799	
1841	4,988,633	10,034,832		5,045,699
1842	4,087,016	4,813,589		726,523
*1843	22,320,335	1,520,791	20,799,544	
+1844	5,830,429	5,454,214	376,215	
+1845	4,070,242	8,606,495		4,536,253
+1846	3,777,732	3,905,268		127,536
+1847	24,121,289	1,907,739	22,213,550	
+1848	6,360,240	15,841,620		9,481,396
+1849	6,651,240	5,404,648	1,246,592	
+1850	4,628,792	7,522,994		2,894,202
	263,449,873	193,390,048	712,290,606	41,230,781

* 9 months ending 30th June. † year do. do.

A statement exhibiting the total value of imports, and the imports consumed in the United States, exclusive of specie, during each fiscal year, from 1821 to 1850; showing also the value of the domestic and foreign exports, exclusive of specie, and the tonnage employed during the same period.

Years.	Total imports.	Imports consumed exclusive of specie.	Domestic produce exported exclusive of specie.
1821....	62,585,724	43,696,405	43,670,394
1822....	83,341,541	68,307,425	49,879,079
1823....	77,579,267	51,308,936	47,155,408
1824....	80,549,007	53,846,567	50,649,500
1825....	96,340,075	66,395,722	66,944,855
1826....	84,974,477	57,652,577	52,449,745
1827....	79,484,063	54,901,103	57,878,117
1828....	88,509,824	66,975,075	49,976,632
1829....	74,492,527	64,741,671	55,087,307
1830....	70,876,920	49,675,099	58,524,878
1831....	103,191,124	82,808,310	59,218,584
1832....	101,029,266	75,227,988	61,726,529
1833....	108,118,311	84,470,087	69,950,856
1834....	126,521,332	86,973,147	80,623,662
1835....	149,895,742	122,007,974	160,459,481
1836....	189,980,035	158,811,392	106,570,942
1837....	140,989,217	113,310,571	94,280,825
1838....	113,717,404	86,552,598	95,160,880
1839....	162,092,132	145,879,816	101,625,533
1840....	107,141,519	86,250,335	111,660,561
1841....	127,146,177	114,776,309	103,636,236
1842....	105,162,087	87,994,318	97,799,242
1843....	64,753,799	37,291,129	77,686,354
1844....	108,435,035	96,390,548	99,531,774
1845....	117,254,564	105,399,541	98,455,330
1846....	121,691,797	110,048,859	101,718,042
1847....	146,545,638	116,859,595	150,574,844
1848....	154,998,928	140,651,902	130,263,709
1849....	147,857,439	133,565,108	181,710,081
1850....	178,136,318	164,022,033	134,900,232

Foreign merchandise exported exclusive of specie.	Total exports.	Tonnage.
1821....	10,824,429	64,974,382
1822....	11,504,270	72,160,281
1823....	21,172,485	74,699,030
1824....	18,321,605	75,986,657
1825....	23,793,588	99,535,388
1826....	20,440,934	77,595,322
1827....	16,431,880	82,324,827
1828....	14,044,608	72,264,686
1829....	12,347,344	72,358,671
1830....	13,145,857	73,349,508
1831....	13,077,069	81,309,582
1832....	19,794,074	87,176,943
1833....	17,577,876	90,140,433
1834....	21,036,553	104,336,973
1835....	14,756,321	121,693,577
1836....	17,767,762	128,663,040
1837....	17,767,762	117,419,376
1838....	9,417,690	108,486,616
1839....	10,626,140	121,028,416
1840....	12,008,371	132,085,946
1841....	8,181,235	121,851,503
1842....	8,078,753	104,691,534
1843....	5,139,335	84,346,480
1844....	6,214,058	111,200,046
1845....	7,584,781	114,646,606
1846....	7,865,206	113,488,516
1847....	9,160,754	152,648,622
1848....	7,986,802	154,032,131
1849....	8,541,091	145,755,820
1850....	9,475,493	151,893,720

Statement of the aggregate annual expenses of the government, exclusive of trust funds, the expenses of Post Office Department and the payment of the principal and interest of the public debt, and the debt assumed per act of May, 20, 1836, from 1st July, 1842, to the 30th June, 1850, and of the appropriations for the year ending 30th June, 1851.

Years ending	Aggregate expenses.	Payments on account of revenue from customs and land sales.
30th June, 1843....	22,724,205 78	4,034,643 79
30th June, 1844....	19,885,793 38	3,822,313 07
30th June, 1845....	21,273,705 67	4,539,980 04
	63,833,704 93	12,396,836 90
Average of 3 years....	21,277,901 64	4,132,278 97
30th June, 1846....	26,690,774 40	4,693,954 76
30th June, 1847....	55,811,633 66	4,053,290 97
30th June, 1848....	42,698,619 05	3,241,404 13
	125,201,017 11	11,988,649 86
Average of 3 years....	41,733,672 37	3,996,216 62
30th June, 1849....	38,048,819 08	3,015,914 08
30th June, 1850....	32,604,500 66	2,649,990 47
Estimates and appropriations for '51....	46,068,859 08	2,518,670 81
	116,922,178 82	3,184,575 36
Average of 3 years....	38,974,059 60	2,728,191 78

STATEMENT of the amount of Gold deposited in the Mint of the United States and its Branches, from Mines in the United States, to October 31, 1850.

Periods.	Virginia.	North Carolina.	South Carolina.	Georgia.	Tenns.	Ala.	New Mexico.	California.	Various sources.	Total.
1824....	5,000	.....	.....	.....	.....	.....	.....	.....	.....	5,000
1825....	19,000	.....	.....	.....	.....	.....	.....	.....	.....	19,000
1826....	20,000	.....	.....	.....	.....	.....	.....	.....	.....	20,000
1827....	21,000	.....	.....	.....	.....	.....	.....	.....	.....	21,000
1828....	46,000	.....	.....	.....	.....	.....	.....	.....	.....	46,000
1829....	2,500	134,000	3,000	.....	.....	.....	.....	.....	.....	140,000
1830....	24,000	204,000	26,000	212,000	.....	.....	.....	.....	.....	466,000
1831....	26,000	294,000	22,000	176,000	1,000	.....	.....	.....	1,000	520,000
1832....	34,000	458,000	45,000	140,000	1,000	.....	.....	.....	.....	603,000
1833....	104,000	475,000	66,000	216,000	7,000	.....	.....	.....	.....	868,000
1834....	63,000	380,000	38,000	415,000	3,000	.....	.....	.....	.....	893,000
1835....	60,400	263,500	42,400	319,900	100	.....	.....	12,300	.....	668,500
1836....	62,000	148,100	55,200	201,400	300	.....	.....	.....	.....	467,000
1837....	52,100	116,900	29,400	53,600	.....	.....	.....	.....	.....	282,000
1838....	55,000	66,000	13,000	36,000	1,500	.....	.....	.....	200	171,700
1839....	57,600	53,500	6,300	20,300	300	500	.....	.....	.....	138,500
1840....	38,995	36,804	5,319	91,113	104	4,431	.....	.....	.....	176,766
1841....	25,738	76,431	3,440	139,796	1,212	3,863	.....	.....	.....	248,478
1842....	42,163	61,629	233	150,275	.....	5,597	.....	.....	13,717	273,587
1843....	48,143	62,873	5,099	56,619	2,788	4,786	.....	.....	415	180,728
1844....	40,595	194,917	11,856	30,739	2,240	12,298	.....	.....	2,377	295,022
1845....	86,783	365,896	5,386	17,325	3,202	6,472	.....	.....	4,328	489,342
1846....	55,538	986,105	100,841	13,601	2,662	7,542	.....	.....	.....	466,089
1847....	67,736	99,491	1,102	10,647	2,511	2,022	.....	.....	.....	133,409
1848....	57,886	109,635	19,228	3,370	3,497	3,670	682	44,177	.....	241,544
1849....	129,382	102,688	4,309	10,425	2,739	2,977	32,889	5,481,439	154	5,767,092
1850*....	65,576	40,568	759	4,928	307	1,178	5,592	22,671,083	326	24,749,817
Total....	1,199,388	4,188,416	504,162	2,349,040	35,442	53,218	39,162	28,196,699	34,767	26,542,594

* 10 months.

SUMMARY STATEMENT

Of the Coinage of the Mint and Branches to October 31st, 1850, inclusive.

MINTS.	Commence-ment of coinage.	Gold coinage. Value.	Silver coinage. Value.	Copper coinage. Value.	Entire Coinage. No. pieces.	Value.
Philadelphia....	1793	83,153,539 50	64,440,617 90	1,283,301 75	324,915,157	148,877,453 15
New Orleans....	1838	18,731,865 00	12,366,700 00	.....	38,622,645	31,093,565 00
Charlotte....	1838	2,646,050 00	.....	.....	623,956	2,646,050 00
Dahlonega....	1838	3,959,666 00	.....	.....	897,956	3,950,666 00
Total....		108,482,120 50	76,807,311 90	1,283,301 75	365,055,884	186,572,734 15

SUMMARY STATEMENT

Of the Deposits of Domestic Gold at the Mint of the United States and Branches, to October 31, 1850.

MINTS.	Virginia.	N. Caro.	S. Caro.	Georgia.	Tenns.	Ala.	N. Mex.	California.	Various sources.	Total.
Philadelphia....	1,197,838	4,138,416	504,162	2,349,049	35,442	53,318	38,963	28,196,699	34,707	36,548,594
N. Orleans....	.....	741	16,217	39,681	2,719	76,242	.....	3,611,355	6,396	3,753,351
Charlotte....	.....	2,489,314	181,012	.....	.....	.....	.....	.....	.....	2,670,326
Dahlonega....	.....	78,967	116,301	3,639,873	38,413	57,017	.....	30,025	.....	3,950,666
Total....	1,197,838	6,707,458	817,692	6,018,603	76,574	186,637	38,963	31,838,079	41,103	46,922,957

STATE VALUATION OF MASSACHUSETTS.

The following interesting table shows the State valuation for the present year as determined by the valuation committee, compared with that of 1840.

	1850.	1840.
Suffolk....	\$214,789,372	\$110,000,000
Essex....	55,556,446	31,110,204
Middlesex....	82,264,719	37,592,082
Worcester....	50,497,793	29,804,316
Hamshire....	12,331,019	7,298,351
Hampden....	23,641,220	10,188,423
Franklin....	9,751,728	6,548,694
Berkshire....	17,137,607	9,546,926
Norfolk....	47,086,510	15,522,527
Bristol....	38,733,046	19,493,685
Plymouth....	19,163,558	10,694,719
Barnstable....	8,897,349	4,696,683
Dukes....	1,235,292	1,109,344
Nantucket....	4,505,202	6,074,374
	\$590,531,881	\$299,878,329

Population of Philadelphia.

The following are the complete returns of the population of Philadelphia, by recent census.

Wards.	Population.	Houses.	Families.
Old Philad. City....	12,376	1,858	2,076
North Mulberry....	8,741	1,308	1,436
South Mulberry....	11,035	1,308	1,437
North.....	11,035	1,507	1,759
Locust....	10,723	1,469	1,597
Middle....	7,225	911	1,154
South.....	6,991	932	1,139
Lombard....	6,201	895	1,076
Spruce....	6,792	950	1,203
Cedar....	9,009	1,235	1,959
New Market....	8,256	1,147	1,520
Pine.....	6,149	808	1,134
Dock....	5,734	585	675
Walnut....	2,544	278	309
Chesnut....	2,443	272	332
High Street....	3,549	385	537
Lower Delaware....	6,425	385	1,024
Upper Delaware....	7,224	910	1,130

Northern Liberties..	121,417	16,272	20,178
	47,233	6,854	8,056
Spring Garden....	58,895	9,150	10,501
Kensington....	46,776	7,555	9,066
Southwark....	38,799	6,451	7,559
Moyamensing....	26,979	4,096	5,269
Suburban Districts.			
Passyunk....	1,607	228	232
Kingsessing....	1,778	289	299
West Philadelphia....	5,670	942	982
Blockley....	5,910	549	557
Penn District....	8,939	1,302	1,577
North Penn....	2,647	447	460
Roxborough....	2,660	465	466
Manayunk....	6,210	1,003	1,175
Germantown....	8,336	1,292	1,432
Bristol....	2,230	354	355
Frankford....	5,344	993	1,074
Oxford....	1,767	255	271
White Hall....	389	82	86
Lower Dublin....	4,297	695	741
Byberry....	1,130	203	207
Moreland....	493	81	85
Richmond....	5,840	1,025	1,124
Bridesburgh....	915	185	185
Aramingo....	694	120	120
Old Nor'n Liberties....	1,938	309	335
	68,956	10,824	11,736

RECAPITULATION

Old City proper....	121,417	16,272	20,178
Northern Liberties..	47,233	6,854	8,056
Spring Garden....	58,895	9,150	10,501
Kensington....	46,776	7,555	9,066
Southwark....	38,799	6,451	7,559
Moyamensing....	26,979	4,096	5,269
Richmond....	5,840	1,025	1,124
Penn District....	8,939	1,302	1,577
West Philadelphia....	5,670	942	982
Total....	360,538	53,647	64,312

Increase in 10 years, 148,320, or 57 per cent.

MICHIGAN CENTRAL ROAD TO CHICAGO.

A proposition from J. W. Brookes, Esq. to the Board of directors of the Galena and Chicago Railroad Co., appears in the Chicago papers. The G. and C. R. R. have a charter for the extension of their road to the Indiana line, and the Central Road now make a reasonable proposition to connect with them—building the road and allowing the Southern road, or any other, the privilege of drawing their cars over it upon such conditions as the Southern road or Buffalo and Mississippi shall grant the Central Company upon the road west from Michigan city. They ask for no special privileges; only that they have free competition with any other road. The Chicago people, we should judge were decidedly in favor of granting the proposition, as it gives a free competition to all roads and no exclusive privilege to either Southern or Central. Give them the privilege and you will have a road through your city in less than a year.—*Detroit Tribune*.

SELF-IMPOSED TAXATION.

Mr. G. Porter, in a communication to the British Association, shows that the working classes of the United Kingdom expend on three articles of luxury the use of which he presumes might advantageously be dispensed with, viz.: Spirits, Beer and Tobacco, the following sums respectively, £24,091,458. \$25,383,165, and £7,588,607, making a total of £57,063,230. "A sum," says he, which must appear "perfectly fabulous until the reasonableness of the result be shown by means of calculations adopted and formed on good authority."

THE INTERNAL COMMERCE OF THE COUNTRY.

The aggregate value of the lake trade, as appears by returns made at the bureau of the Topographical Engineers, amounts to the enormous sum of \$186,485,269; or more by \$40,000,000 than the whole foreign export trade of the country. The aggregate tonnage is 203,041 tons, of which 35,904 is foreign. The net value of the commerce of the western rivers is \$256,233,820, the value of vessels \$18,661,500. The gross value of the internal commerce of the United States, which is almost double that of the net value, is \$795,654,774.

Scarcity of Silver Coin.

The following article, which we find in the Philadelphia North American, presents interesting statements upon a subject of marked interest, especially commercial circles:

The present scarcity of silver coin is very inconvenient and shows the expediency, if not the necessity of an alteration in the mint law.

The act of 1837, like those it superseded, proceeds upon a false principle, inasmuch as it fixes a relative value between gold and silver coins; at which they are both or either of them, legal tenders giving the payer the option of selecting the least valuable coin to discharge his debt, thus forcing the circulation of one metal and banishing the other from sight. Again—our coins are taken abroad at their intrinsic market value, and consequently the legally undervalued metal is always sought for at a premium for exportation and sale, and this is enough to prevent the banks from issuing a dollar of it more than they can avoid.

The intrinsic value of coins constantly fluctuates with the supply of the metal composing them; and since, therefore, the true value of relative gold and silver is always changing, it is absurd to fix an arbitrary legal relative value, which has the effect of making gold coin money, and silver coin a commodity, or the reverse.

The fluctuations in the relative value of gold and silver have been greater than is usually supposed.

Judging from the English coinage, which however, is only an approximation, this value was, in A. D. 1344, 1 oz. of gold was worth 12 oz. of silv. 1546, 1 oz. do. do. 5 oz. do. 1717, 1 oz. do. do. 15 2 oz. do. 1846, 1 oz. do. do. 14 28 oz. do.

The fall in the value of silver from 1546 to 1717 is attributed to the supply from the American mines, and the discoveries in California promise to reverse the movement.

By the act of Congress of 1792, 1 oz. of gold was made worth 15 oz. of silver, and the practical result

was that until 1834, gold coin was not a circulating currency, but was bought and sold at a premium.

The act of 1834 made the proportion 1 to 16, and that of 1837 made it nearly the same. The relative values of gold and silver in the coinage of England is 1 to 14 28; France 1 to 15 nearly; and the United States 1 to 16 nearly.

We have now an over valuation of the gold, and this has probably lately been increased by the produce of the Russian and California mines.

The result is that silver coin is sought for exportation at a premium, and hoarded by the holders to an extent that is becoming very inconvenient to those having payments for wages, or small sums; and as the tendency of the arrivals of California gold is to create a high exchange on Europe we may expect that silver coin may be banished from circulation, or from the country.

The same results have occurred in other countries from the same causes. On the continent of Europe the current coins are silver, gold generally bearing a premium.

The British Mint act of 1846, has remedied the evil for that country by a simple provision making gold coin only a legal tender for more than forty shillings, and silver coins far under that amount, the silver coin being at the same reduced to weight to insure its not being exported.

The extent of this reduction, compared to our standard, is shown by the fact that \$100 in American gold coin, (containing 322 grains fine gold,) would be coined at the British mint into £20 10 11 d., and a 100 dollars in our silver coin, containing 37.125 grains of fine silver, would be coined into £22 19 10 d. of British silver.

Gold, therefore, is the legal currency of Great Britain—silver being plenty for change—and bearing the same relation to gold, that copper does with us to gold and silver.

It seems clear that if we make gold and silver legal tenders, we must make up our minds to do without one of them; but if gold alone is a legal tender, we can have both in convenient use.

The alterations proposed would have no effect upon existing contracts, as the standard of gold coin would remain unchanged and the debtor would not be permitted to pay in the reduced silver coin.

Further information may be found in MacCulloch's Com. Dic.; article coin. (American edition.)

COMPARATIVE ELASTICITY OF WROUGHT & CAST IRON.

The mean ultimate resistance of wrought iron to a force of compression, as useful in practice, is 12 tons per square inch, while the crushing weight of cast iron is 49 tons per square inch; but for a considerable range; under equal weights, the cast iron is twice as elastic, or compresses twice as much as the wrought iron.

A remarkable illustration of the effect of intense strain on cast iron was witnessed by the author, at the works of Messrs. Easton and Amos. The subject of the experiment was a cast iron cylinder 10 1/2 inches thick, and 14 1/2 inches high, the external diameter being 18 inches.

It was requisite for a specific purpose to reduce the internal diameter 3 1/2 inches, and this was effected by the insertion of a smaller cast iron cylinder into the centre of the large one; and to insure some initial strain, the large cylinder was expanded by heating it, and the internal cylinder being first turned to large, was thus powerfully compressed.

The inner cylinder was partly filled with pewter, and a steel piston being fitted to the bore, a pressure of 972 tons was put on the steel piston. The steel was "upset" by the pressure, and the internal diameter of the small cylinder was increased by full three-sixteenths of an inch; i. e. the diameter became 3 eleven-sixteenths of an inch! A new piston was accordingly adapted to these dimensions, and in this state the cylinder continues to be used, and to resist the pressure: the external layer of the inner cylinder was thus permanently extended 3 one-fifths of its length. In fact it can only be regarded as loose packing giving no additional strength to the cylinder.

Under these high pressures, when confined mechanically, cast iron as well as other metals appears, like liquids, to exert an equal pressure in

every direction in which its motion is opposed.—*Clark's Britannia and Conway Tubular Bridges.*

Ohio.

Railroad Meeting at St. Clairsville.—The meeting on Saturday last at St. Clairsville, on the subject of a subscription on the part of Belmont county to the Western Ohio Railroad was interesting, and the subject generally discussed by Messrs. Carroll, Kennon, Sullivan, of Zanesville, Wharton, Cowen, Clemens and Rammage. No action was taken at the meeting except to adjourn to 1st Thursday in January, when we opine there will be one of the largest meetings ever held in the county. The feeling has been aroused throughout the County.—*Wheeling Gazette*.

New York.

Buffalo and Cohocton Railroad.—There is to be a meeting of the Board of Directors at Bath, on the 7th of January, to prepare the road for letting. It is proposed to have forty miles from Corning West, graded and ready for superstructure by the first of August next, and cars running by the first of October, while at the same time the work will be going forward on the other sections.

Albany and Schenectady Railroad.—The traffic on the Albany and Schenectady Railroad during the month of November, proves to be much larger than the estimates of the Directors in their report to the Stockholders. The receipts are as follows:

From passengers	\$10,903 43
" freight	6,719 18

17,622 21

November, last year	15,412 55
---------------------------	-----------

Increase

\$2,210 06

Trade between the U. States and Canada.

The Oswego Times publishes the statistics collected by direction of the Treasury Department, in relation to the nature, extent and progress of the trade between the United States and Canada. The tables embrace the year 1840, '45 '49 and the greater portion of the present year.

The following is a summary of the tables published by the times:

Imports from Canada.		Exports from Canada.	
1840....	\$162,741	\$2,742 51	\$398,356
1843....	354,264	10,448 62	8,015,879
1849....	3,231,317	561,493 68	3,687,635
1850....	2,832,783	566,221 28	3,094,873

Total \$6,581,135 \$1,140,966 09 \$11,146,743

This shows an apparent excess in the value of exports over imports of \$4,565,608.

In the eleven millions of exports in four years there are \$3,218,736 of "foreign merchandise,"—goods which pass through our canals in preference to making the passage of the St. Lawrence river.

Now we will compare the increase of imports and exports for 1840 and 1849, on lumber, animals and vegetable food, of which there is a surplus on both sides of the line:

Imports from Canada.		Exports from Canada.	
	1840.	1849.	1840.
Products of			1849.
Forest	\$23,303	\$708,161	\$22,296
Animals	4,532	308,393	32,313
Vegetable food	672	1,544,859	150,044
Total....	\$28,507	\$2,561,416	\$204,683
		28,507	204,683

Inc. of Imports....\$2,532,909 Inc. of Ex. \$320,66

It will be seen that while the exports of the above articles in 1840 were nearly eight times greater than the imports, the imports in 1849, in spite of our duties were nearly six times greater than the exports. This shows that Canada prefers our market to her own; and the use of our canals to the free navigation of the St. Lawrence river.

Connecticut.

Hartford and Willimantic Railroad.—We learn that the receipts during the year have amounted to \$90,000, and that during the last three months they have averaged about \$10,000 a month. It is only one year since the portion of the road between Hartford and Willimantic was opened to the public. About a month later the cars were running west to

Plainville, and in June the road was finished to Bristol. These are facts highly encouraging to the future prosperity of the road. A small dividend has been earned, but it has been used to reduce the liabilities of the company.

NO COAL IN CALIFORNIA.

Mr. P. T. Tyson, of Baltimore, as the result of a scientific visit to the late Territory of California effectually contradicts the report of a plentiful supply of coal there, in a communication to one of the Departments at Washington; and it seems likely he says, that the same geological features extend from near the Oregon boundary to the southern terminus of Lower California. An inspection of the various localities where coal has been reported to exist, proved that every one of those beds described as of "the best quality for steaming," were composed of either lignite or bitumen, or something or other still further removed from the character of coal. It is to Vancouver's Island Mr. Tyson says, that California must look for supplies unless they may be obtained from Oregon.

New York.

The citizens of Potsdam (on the Ogdensburgh railroad,) have appointed a committee to organize a company, open books, and take all necessary incipient measures for the construction of a railroad from Potsdam to some point on the road from Albany to Buffalo. Such a road would greatly benefit the Ogdensburgh by giving to it a portion of the travel and trade to and from Buffalo direct.

Alabama.

The Selma Railroad.—We learn from the Reporter that ground was broken on the Alabama and Tennessee River Railroad on Monday, 25th ult., by Messrs. R. M. and W. Waddell. Other contractors will soon commence operations. We believe with the Reporter, that considering the enterprise of the contractors, the energy of the chief engineer and his corps and the zeal and ability of the Directors and the President, this great work will be completed within the shortest possible time. *Cr. Alabama Planter.*

New Jersey.

An election for Directors of the Paterson and Hackensack Railroad Company was held at the Franklin-House, in this town, on the 20th inst., when the following persons were duly elected for the ensuing year:

D. K. Allen, Garret S. Van Wagoner, and Samuel Smith, of Paterson; John Huyler, and John Ackerman, Jr., of Bergen; and Alonzo R. Smith Robert Davis, of New York.

We learn that a flare-up occurred among the stock-holders at this meeting, when a motion was made to dissolve or abandon the whole concern, which was carried; but upon cooling down a little the motion was reconsidered, and the election of Directors proceeded with, which resulted as above.

Kentucky.

Prospects of the Maysville Railroad.—The following flattering statement of the prospects of this road, is from the Maysville Eagle:

To remove doubts in some quarters and delusions and misrepresentations in others, we shall here state the prospects of the Maysville railroad for means of construction.

The city of Maysville has subscribed \$150,000 stock. The citizens of Maysville by private subscription, have taken over 105,000 stock. Nobody doubts that Mason county in her corporate capacity, will by a decisive expression, take \$150,000 stock. In addition to all this, the competition in private subscriptions on the rival routes, will add at least \$50,000, and probably 100,000 to the stock—in the aggregate, say \$455,000 at the least.

Our prospects in Nicholas, Bourbon and Fayette are brightening daily, Fayette without doubt, will vote us \$200,000, besides private subscriptions

on the adopted route. Bourbon will vote as much in the end, or if not, we can get that much on the North Middletown route by private subscriptions. Nicholas we are assured, will vote \$100,000, besides private subscriptions on the route. Louisville has already proffered \$100,000, and we are advised will double it if necessary.

The resources above mentioned, when all drawn on, cannot realize less than \$1,200,000. But besides these, eastern contractors of ample capital, have offered to grade and bridge the whole road, at fair estimates, and take one-fourth of their pay in stock. This equivalent to a subscription of stock to the amount of two or three hundred thousand dollars more.

The whole road completed, with locomotives and every thing ready for effective business, it is estimated will not exceed \$1,500,000. But if it were necessary, we could buy the superstructure—that is, the timber or cross ties, and the best iron rails, on a credit payable in part in bonds of the company, redeemable out of the earnings of the road and in part in stock.

There never was a railroad in the West that started with so good a basis. With such prospects, who can doubt the speedy completion of the great work! We were never more sincere in predicting that the completion of the Maysville road will be celebrated before the Covington road will be finished even to Cynthiana.

LUMBER TRADE OF BANGOR MAINE.

The following is a statement of the amount of Lumber surveyed at Bangor for the season ending Dec. 1st, 1850.	
Amount run to Bucksport, and surveyed here	201,005,440 ft.
Do. to Fankfort, do.,	1,411,211
	1,337,550
	203,754,201

The largest amount hitherto surveyed in any one year was in 1848, when it reached to the sum of two hundred and twelve millions. More has been shipped, however, the present season, than at any prior one. The above figures are exclusive of laths clapboards, shingles, etc., which are technically denominated "short lumber," the annual value of which is estimated by some to equal that of the kinds included in the footing above, the average price of which last has been the present season \$10 per thousand feet.

Virginia.

James River and Kanawha Co.—In the absence of the late annual report of this company up the present year, we extract from the Virginia papers, the following statement of its operations for the year just ended:

	Rec'd.	Disb.	Nett.
Canal to Lynch	\$239,684	\$73,815	\$155,969
Richmond Dock	9,531	3,817	5,714
B Ridge turnpike &c.	1,434	915	519
Kanawha River	10,989	4,180	6,809
Kanawha Road	8,629	11,556	2,916 minus.
	270,267	104,174	166,193
Gross receipts from works as above			\$270,267
Balance on hand 1st Nov., 1849.			22,351
Miscellaneous Rec's.			4,456
Premium on State bonds sold			13,556
			130,653
Disbursements for general administration, repairs, etc., as above			\$104,174
			206,476

INTEREST DISBURSEMENTS.

Annuity to old J. R. Co.	\$21,000
Int. on former bonds (\$1,018,645)	117,089
Do. under act of 1847,	59,340
Do. do. Dock Con.	3,204
Do. do. South Side, &c. do.	1,968
	202,601
	3,878

Besides the disbursements above stated, there was paid, for old unclaimed dividends \$10 71, and for redemption of post notes, repairs of Maiden's Ad-

venture Dam Culverts, etc., \$6,203, making an excess of disbursements over receipts of \$3,335. But this excess is subject to deductions of sums to be paid and to be refunded, to 4,747—reducing the whole deficiency to \$587 99.

It appears that the company had on hand, on Nov. 1st, 1850, applicable to the completion of the second division, viz.: the section between Lynchburgh and Buchanan, in cash \$105,149, in unsold bonds, issued under the act of 1847, \$105,100; and in bonds yet to be issued, under the act of 1850, \$110,000—total \$321,048. For the tide water connection, there was available, on Nov. 1st 1850, in cash, \$31,228; in bonds unsold, \$235,800, total \$267,028. For the South Side and Rivanna Connections, there was available in cash \$13,975; in bonds unsold \$84,100—total \$97,375.

It will be seen, from the figures above under the head of Interests, Disbursements, that the company has during the last fiscal year, paid the large sum of \$64,502 for interest on guaranteed bonds issued for the construction of improvements which are yet unfinished, and of course yield no revenue. This sum will be necessarily increased when those improvements shall have been completed, and their whole cost expended. But then they will begin to be productive; and there can be little doubt that their aggregate effect will be to furnish the means of paying at least the interests upon their cost. The Dock connection, besides bringing the Dock into active use, will tend greatly to increase the tonnage and tolls of the whole line by removing an onerous tax upon transportation. The South Side and Rivanna connections will materially widen the area from which the canal will draw its trade; and the Rivanna improvement, especially, must throw upon it nearly all the business of the Albermarle.

Central Railroad.—The cars on the Central railroad are now running from the junction to Richmond.

STOPPING RAIL ROAD TRAINS BY ELECTRICITY.

Messrs. H. Freeman and J. Patterson, of this city, have invented a means of stopping railroad trains by means of electricity, so as to dispense with the service of brake-men. The plan contemplates the arrangement of a Galvanic battery on the locomotive, under the eye and hand of the engineer with a rod running thence to each wheel in the train, connected with the different clogs or brakes, and to be connected with the battery by a trench, so as to apply simultaneously and instantly any desirable amount of pressure to every clog. It is computed that a train may be stopped in half the time now required, and with far less jarring, jerking or wrenching of the cars. Scientific men who have examined the plan have certified that it is entirely feasible.

Tennessee.

Nashville and Chattanooga Railroad.—The steamer Beauty, from Cincinnati, brought a day or two since, a locomotive, a tender, 13 freight cars, and a splendid passenger car, for the Nashville and Chattanooga railroad. The engine is the manufacture of A. Harkness and Son, of Cincinnati, and said to be an excellent one. The car is from the manufactory of Keck and Davenport of the same city. This looks like getting ready for the trip to Murfreesborough the 4th of July. We are glad to learn that the road is progressing rapidly "all along the line." All the iron is now shipped and paid for.—*Whig of the 17th inst.*

Ohio.

Cincinnati and Belpre Railroad.—The directors of this company, at a meeting held at Chillicothe on the 14th inst., determined to place the line of their road from Greenfield to a point on the road eleven miles east of Chillicothe, under contract, [grading, grubbing and masonry,] by the 3rd day of March, 1851. The requisite steps were taken, also, to notify the Hillsboro' and Cincinnati Railroad Co., of the readiness of the Belpre Board to merge the two companies on the "Basis of arrangement" adopted in June last.

From the London Athenæum.

REPORT OF THE COMMISSIONERS APPOINTED TO INQUIRE INTO THE APPLICATION OF IRON TO RAILWAY STRUCTURES.

Iron roads traverse the land in its length and breadth; binding with their chains the remotest districts of the island, and giving to the inhabitants of Great Britain more completely the character of a united family than they have ever before enjoyed. With the increasing commercial prosperity of our country grew the desire to obtain the means of more rapid communication. Maritime Liverpool pined to draw nearer to manufacturing Manchester, and metropolitan London panted to reach more quickly the metal part of Birmingham. Of this gradually intensifying desire the locomotive use of steam with all its incidents, was more than the fulfilment. Hills were broken down, and their debris employed to fill up the valleys—mountains were bored and rivers spanned—to make the commercial dream a reality. In carrying out these gigantic tasks, the ordinary materials failing to answer the purpose demanded—some new one was to be sought; and wood and stone being abandoned, our highways were paved with iron. The iron rail on which the steam giant toils, with its enormous train, viaducts and bridges, suspended roadways and perforated tunnels, are all constructed from this most important metal.

Though iron has its place in technical history from a very early period, and although man has shaped it into a thousand forms, yet under the new conditions to which it is so extensively submitted it was soon discovered that we were ignorant of its physical conditions, and particularly of its molecular changes. The importance of obtaining this knowledge was pressed on us by more than one painful accident arising from the breaking of cast iron girders, though they had been previously tested, and proved to be of sufficient strength to support considerably more weight than was to be placed on them. As these accidents had arisen in mills where the iron beams were subjected to the influence of long-continued tremor promoted by the machinery, or on bridges which were submitted to the rapid passage of heavily laden trains, it was thought that some important molecular change must have taken place in the structure of the iron. This impression received support from the evidence of many experiments. Iron bars were selected, which, when broken, presented a fibrous structure, and these were subjected to long continued vibratory action; after which on being broken they often showed a crystalline fracture. These experiments have been deemed by many to be fallacious, and we find Mr. Brunel stating that "the same piece of iron may be made to exhibit a fibrous fracture when broken by a slow heavy blow, and a crystalline fracture when broken by a sharp short blow." We are, however, assured by many of our most experienced machinists that iron does undergo a molecular change when subjected to long continued agitation, and that this injurious change can be always repaired by careful annealing. When we have indisputable evidence of long continued molecular disturbances under the influences of heat and electro-magnetism, we are disposed to believe in the theory that structural derangement may be produced by merely mechanical causes. It was, therefore, to investigate the subject of the application of iron to railway structures that a commission was appointed, consisting of Lord Wrottesley, Profs. Willis and Hodgkinson, Capt. James, and Messrs. George Rennie and William Cubitt, with Lieut. Galton as secretary; and well do these commissioners appear to have performed the duty committed to their charge.

At starting, the commission endeavored to make themselves acquainted with all the experiments which had been already made on iron by engineers; and on this point they state:

"From the information supplied to us, it appears that the proportions and forms at present employed for iron structures have been generally derived from numerous and careful experiments, made by subjecting bars of wrought or cast iron of different forms to the action of weights, and thence determining by theory and calculation such principles and rules as would enable these results to be extended and applied to such larger structures and loads as are required in practice. But the experi-

ments were made by dead pressure, and only applied, therefore, to the action of weights at rest. As it soon appeared, in the course of inquiry, that the effects of heavy bodies moving with great velocity upon structures had never been made the subject of direct scientific investigation, and as it also appeared that in the opinion of practical and scientific engineers such an inquiry was highly desirable, our attention was early directed to the devising of experiments for the purpose of elucidating this matter."

As all railway structures are necessarily exposed to "concussions, vibrations, torsions, and momentary pressures of enormous magnitude produced by the rapid and repeated passage of heavy trains," it became a question of the utmost importance to ascertain if any, and what amount of change was produced in iron under these influences. It must be remembered that although the injurious action may be in each case exceedingly small, and unworthy of particular notice, it is, from the nature of the material, probable that such derangement has a certain degree of permanence, and that by multiplying the causes a dangerous, and perhaps fatal, result may ensue. We should not be satisfied that the iron bridges spanning our numerous rivers, roads, and valleys; or the tubes which cross the Menai Straits and continue the Holyhead line at Conway, are secure for a few years to come. We should determine the amount of injury, if any, which is produced by the passage of every train, and so secure these structures that they may be maintained in perfect safety, with ordinary attention, for any period of time. To ascertain the effects of moving weights, a well devised apparatus was constructed in Portsmouth Dockyard, and a very extensive series of experiments made by Capt. James and Lieut. Galton. "The results which they obtained were equally new and important, developing for the first time the fact that a given weight passing rapidly along a bar produces a greater deflection in that bar during its passage than it would have done had it been suspended at rest from the centre of the bar." That is to say, a much less load will break an iron bar when moving rapidly along it, than will fracture it in a state of rest. In the report we are informed:—

"Thus, for example, when the carriage loaded to 1120 pounds was placed at rest upon a pair of cast iron bars, 9 feet long, 4 inches broad, and 1½ inch deep, it produced a deflection of six tenths of an inch; but when the carriage was caused to pass over the bars at the rate of ten miles an hour, the deflection was increased to eight-tenths, and went on increasing as the velocity was increased, so that at thirty miles per hour the deflection became 1½ inch; that is, more than double the statical deflection. Since the velocity so greatly increases the effect of a given load in deflecting the bars, it follows that a much less load will break the bar when it passes over it than when it is placed at rest upon it; and accordingly, in the example above selected, a weight of 4150 pounds is required to break the bars if applied at rest upon the centres, but a weight of 1778 pounds is sufficient to produce fracture if passed over them at the rate of thirty miles an hour."

The commissioners properly insist, therefore, on the importance of giving to all railway structures an amount of solidity far superior to that which is found by experiment or calculation sufficient to support as a dead weight the heaviest loads that can travel on them.

A most important series of experiments by Mr. Eaton Hodgkinson on the tensile and crushing strengths of iron under a great variety of forms and conditions, which form appendix A to this report, must prove of the utmost value to engineers; so will the mathematical investigation of the subject by Prof. Willis and Mr. Stokes.

It is shown by some carefully conducted experiments made by Capt. James that the strength of iron bars is not increased with their diameters; owing to the circumstance of their assuming a crystalline structure in the middle during the process of cooling, which goes on, of course more slowly there than on the outside of the bar. This has been frequently observed in large iron castings; but we are not aware of any published set of experiments which so satisfactorily show the great importance

of annealing all iron girders, and of limiting the thickness of each mass of iron employed for supporting heavy, and particularly moving, weights, as Capt. James's. This thick blue book and its accompanying volume of plates, we must regard as a valuable contribution to scientific engineering. It is, however, to be regretted that the experiments of the commission did not embrace the effect of wrought iron tension bars on cast iron girders as applicable to such structures as the Dee and numerous other bridges of a similar construction.—By some this form has been absolutely condemned as insecure; while other engineers still contend that it may be employed with safety.

We understand that the labors of this important commission were prematurely stopped by cutting off the necessary funds for carrying on the experiments. Surely, seeing the important uses to which on land and sea iron is now employed, it was not a wise economy to put an end to an inquiry which promised to be of such great national importance.

Ohio.

Railroads Leading from Cleveland.—We copy the following from the Cleveland Herald in relation to the various railroads in progress radiating from that place:—

"The work upon the Cleveland, Columbus and Cincinnati road advances finely. There is sufficient iron here to complete the track to Columbus. About thirty-five miles only are now unfinished.—On the portion unfinished, the contractors are laying from one to two miles of track per day. If the weather prove favorable, within thirty days, we shall have an unbroken railroad connection from Cleveland to Cincinnati.

On our Cleveland and Pittsburgh road, also, they are doing well. The track is mostly laid between here and Bedford—twelve miles—and the necessary cars and locomotives are in readiness for the road. There is every indication, from the energy displayed by the gentlemen concerned in the prosecution of the work for the year past, that a very considerable portion, if not the whole of it, will be completed at an early day.

West of us, from here to Toledo, there are two rival companies, and two different routes. No portion of the line, on our route, is under contract. Between Cleveland and Elyria they have commenced grading the road. The probabilities are, however, that the two companies will reconcile their interests, and become united. If this be done, there are local sources sufficient to construct the road, and its completion will be secured at an early period.

East of us, the Cleveland and Erie road is on good footing; and the stock subscription is gradually filling up. The contractors are busily engaged in getting out the timber and stone for the bridges across Grand river and Ashtabula and Conneaut creeks, which are the heaviest structures on the line. We notice that the workmen are scattered over the route between here and Painesville; and the grading of the road has been commenced at different points. It is in contemplation to have the first thirty miles done by next August; and the most of it, if not the entire road, completed next season. The bill pending in the Ohio Legislature became a law last week, authorising the company to alter their gauge, so as to conform to the gauge of the New York and Erie, or any other road, with which they may connect in the State of Pennsylvania. This is an important provision. We learn, however, that it is an open, what gauge will be adopted.

Taken, therefore, all in all, our railroad prospects on every side are extremely good.

STATE DEBT OF INDIANA.

We are indebted to the Tribune for the following detailed statement of the nature and amount of the public debt of this State. The arrangements made when the loan of \$800,000 was obtained for the completion of the canal, created no less than eight different descriptions of stock under various titles, and of different values. Under the funding arrangement, the State debt was divided into two parts, one to be called "Indiana State Stocks," and provided for by taxation, and for which the State faith is pledged; and the other called "Indiana canal stocks," and for which the Wabash and Erie canal lands, etc., are pledged. Under this arrangement, for each bond and its accrued interest, the holders received:

1. For one half the principal a certificate for \$500, bearing interest at 5 per cent., payable half-yearly, commencing in July, 1847; 4 per cent. in cash, and 1 per cent. funded to 1853: after 1853, the whole payable in cash.

2. For one half of the back interest a certificate for \$150, bearing interest at the rate of 2½ per cent. after 1853.

These stocks are payable by the State.

3. For the other half of the principal, a certificate for \$500, bearing 5 per cent. interest after the 1st of January, 1847.

4. For the other half of the back interest, a certificate of \$150, bearing 5 per cent. interest after the 1st of January, 1853.

These stocks are payable out of the revenues of the canal.

There then exists the following debt and stocks pertaining to the State of Indiana:

1st. Indiana bonds, so long as there are any not converted.

2d. The Indiana canal loan, bearing 6 per cent. interest, issued for the eight hundred thousand dollar loan.

3. The Indiana State 5 per cent. stock, issued for half the principal.

4th. The Indiana State 2½ per cent. stock, issued for half the interest.

5th. The Indiana canal 5 per cent. preferred stock, issued for half the principal to subscribers.

6th. The Indiana special 5 per cent. preferred stock, issued for half the interest to subscribers.

7th. The Indiana canal, 5 per cent. deferred stock, issued for half the principal to non-subscribers.

8th. The Indiana special 5 per cent. deferred stock, issued for half the interest to non-subscribers.

The canal stock issued to subscribers to the loan is called "preferred canal stock," and will be first paid, both principal and interest, out of the canal revenues, before any payment of either will be made upon the canal stock issued to non-subscribers.

The amount of these stocks is as annexed:

STATE.	
5 per cent. State stock, paying 4 per cent. till 1853.....	\$4,941,000
2½ per cent. do., interest after Jan. 1, '53.....	1,775,600
CANAL.	
6 per cent. canal loan.....	815,850
Preferred canal stock, interest 5 per cent from Jan. 1, '47.....	4,079,500
Special preferred canal stock, interest 5 per cent. Jan. 1, '53.....	1,215,825
Deferred canal stock, interest from Jan. 1, '47.....	861,080
Special deferred canal stock, interest from Jan. 1, '53.....	250,600
Old Indiana bonds outstanding and unconverted \$1,186,000, and interest from 1841. This amount of outstanding bonds, viz: \$1,186,000, is convertible, as of Jan. 1, 1851, into the following stocks, viz:	
5 per cent. Indiana State, interest 4 per ct. from Jan. 1, 1851, to Jan. 1, 1853.....	\$593,000
2½ per cent. Indiana State, interest from Jan. 1, 1853.....	308,360
Deferred canal, 5 per cent. interest from Jan. 1, 1847.....	593,000
Special deferred canal, 5 per cent. interest from January 1, 1853.....	177,900

Thus the canal preferred stocks, bearing 5 per cent. interest from 1847, issued to the subscribers to the advance of \$800,000 for the completion of the Wabash and Erie canal, in Indiana, to Evansville, on the Ohio river, form the first lien on the revenues of the canal, and the proceeds of the canal lands, after refunding the advance of \$800,000. No more preferred stocks can be issued, the books being closed.

The canal is in operation a distance of 268 miles in Indiana.

The tolls for the year ending 1st November, 1850, were.....\$157,170 95
For the same period, 1849.....134,659 03

Increase.....\$22,511 92

Increase \$22,511 92—less \$2,228 36 received at the new office opened at Terre Haute during the summer—the balance of tolls for both years having been received on the same length of line. The increase in 1850 would have been much greater if the price of grain had not been so low as to induce farmers to hold back their crops. There remains a large quantity in the country which must come out in the spring. The cash receipts for sales of land amounted in 1850 to nearly \$100,000. The quantity of land on hand, according to the last circular from the trustee's office, was 856,498 acres, the appraised value of which was \$1,973,512 53. There remain to be completed about 90 miles of canal, running through one of the richest and most fertile regions of country in the western states.—This portion is now under contract for its entire completion; the work is going forward with great vigor, and the entire line is expected to be opened to Evansville early in 1852. The southern portion of this great work will be navigable throughout the entire year. It is estimated that after the completion of the canal, there will remain on hand lands to the value of \$1,000,000, equal to 25 per cent. on the whole debt. Estimating the net receipts of tolls during the current year at \$100,000, the revenue would be sufficient, if applied to that purpose, to pay 2½ per cent. on the amount of preferred canal stock. What may be expected when the work is completed to the Ohio river, and the outlet opened for the produce of all the southern part of Indiana?

The market value of these different stocks is as follows:

Indiana old bonds with accrued interest coupons thereon from (and including that due on) 1st July, 1841, 55 per cent. or \$550 for each bond of \$1000, and all their arrears of interest.

Indiana canal 6 per cent. loan, interest payable 1st July and 1st January, at the office of the trustees in this city; 88 per cent. last sales—90 now asked.

Indiana 5 per cent. State stock—81 offered, 82 asked; January interest off.

Indiana 2½ per cent. State stock—sales at 39; interest on them commences in 1853.

Indiana canal preferred 5 per cents—sales at 30 per cent. All interest from 1st January, 1847, goes to the buyer.

Indiana special preferred 5 per cent. canal stocks—sales 15 per cent. Interest on them commences in 1853.

Indiana deferred canal 5 per cent. stock—sales at 10 per cent. Interest on them accrues from 1st Jan., 1847, but is not to be paid till preferred stocks are fully provided for.

Indiana Special Deferred five per cent. Canal Stocks. [Interest commences to accrue after 1853, but not to be paid until Preferred Stocks are all provided for.] 6 to 8 per cent.

In connexion with the above we add the estimate of Governor Wright of the receipts and expenditures of the State of Indiana for the financial year 1851:

ESTIMATED REVENUE.....		\$490,000
EXPENDITURES.		
State Government.....	\$90,000	
Convention.....	70,000	
Benevolent Societies.....	60,000	
July Interest, 1850.....	93,000	
January interest, 1851.....	100,000	
Scrip redeemed.....	77,000	
		\$490,000

Manassas Gap Railroad.—We announce with great pleasure, that the President and directors of the Manassas Gap railroad company, have ordered the Chief Engineer to place the work under contract forthwith, up to Wither's Depot, in Fauquier county—a distance of thirty-two miles from the junction with the Orange and Alexandria railroad—giving us a road of sixty miles through a fine country, leading to the great valley of Virginia.—The distance to the top of the ridge, has, also, been ordered to be located and the work commenced.—Thus auspiciously begins this important improvement. May it go on prosperously to its final completion! We will give hereafter the names of the contractors and other particulars.—*Alexandria Gazette.*

MOBILE AND OHIO RAILROAD.

The counties of Macon and Neshubee, in Mississippi, have each voted to subscribe \$100,000 to the capital stock of the above road.

Kentucky

Covington and Lexington Railroad.—At the annual election for directors of this road, held on the 7th inst., the following gentlemen were elected:

John S. Morgan, Covington.

C. A. Withers,

F. G. Gedge,

M. M. Benton,

A. L. Greer,

Lucius Desha, Harrison co.

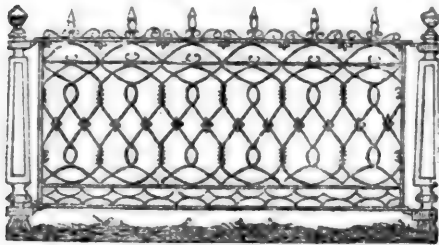
Augustus Robbins, Pendleton co.

At a subsequent meeting of the board, Col. J. S. Morgan was re-elected President, S. Walker, treasurer, and F. Wise, Esq., secretary.

Massachusetts.

Western Railroad.—The Directors of this Corporation are to meet at Springfield, on Wednesday next, to act upon the annual report and declare the half-yearly dividend. The *Boston Courier* says: The gross earnings of the Corporation for the financial year, ending 30th November, amount to \$1,365,000, being an average increase of \$2,000 per month over the receipts of the preceding year. The net income after paying the expenses, interest repairs, renewals, etc., leaves cash on hand, at interest, sufficient to pay a semi-annual dividend of four per cent, besides carrying 50,000 to the sinking funds and about \$10,000 to the contingent fund. The sinking funds will be increased this year by the sum of \$100,000 of which \$50,000 will be taken from the net income, and the other \$50,000 from the accrued interest upon those funds, which are invested in mortgages, railroad shares, Massachusetts sterling fives, and \$175,000 of Boston and Worcester Bonds, at par; but which are now worth in market 7 per cent premium. The valuation of the two sinking funds is considerably above original cost, and together with the contingent fund, amount to \$1,100,000, equal to nearly \$32 per share of the capital stock. These funds are silently & rapidly, increasing, and render the stock a desirable investment for present revenue, for security, and for posterity. The Corporation have settled with Mr. Ware, the late receiving and disbursing clerk at Springfield, by taking his note for the sum of \$55,000, after receiving from him about \$20,000, which was the whole of his visible property; 75,000, having been the amount of the apparent discrepancies in his accounts spread over a series of years. Whether or not this probable loss of \$55,000, as above, will be deducted from the large contingent fund, or from the net income of the past half-year, remains to be decided.

NEW YORK WIRE RAIL- ING WORKS.



PUBLIC ATTENTION is invited to a new improvement in manufacturing Iron Railing, Grating, etc., made from Iron Rods and Wrought Iron, designated

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It is the most beautiful enclosure for public or private use, viz: *Public Grounds, Farms, Cemeteries, Balconies, Verandahs, Arbors, etc., etc.*

WINDOW GUARDS AND GRATING,
For Stores, Dwellings, Lunatic Asylums, Prisons, Steamships, etc.,

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INGS, TREE GUARDS, COAL
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And a variety of Articles to numerous to mention, which this invention is susceptible of; possessing conveniences never before known, resulting from the improvement for which this article was patented. For elegance, combined with strength, for the beauty of its innumerable variety of designs, and especially for cheapness, (at one half less than cast iron), it is altogether unrivalled by anything as yet offered to the public.

The plan of crossing the rods is so contrived that each binds the other, and thus a mutual support is given to each individual part of the whole structure.—It is believed that fabrics formed of the largest wire, and manufactured in this manner, will endure at least five times the violence that the Cast Iron Railing in ordinary use is capable of withstanding.

Prices vary from 30 cents to \$2 per lineal foot.

The Subscriber also manufactures

WIRE FENCES,

For enclosing *Farms, Railroads, Parks, Lawns, etc.*, guaranteed to resist Cattle, Horses, Sheep, etc., which are becoming extensively used, and greatly distinguished by *lightness* of appearance and *elegance* of form; being imperceptible at a short distance, the view is thus uninterrupted, the prospect uninjured, and the beauty of Landscape unimpaired.

This Fence is made on an entirely new plan, being portable, yet secure; the whole may be taken down and transported with the same facility as ordinary iron rods.

Price, from \$1 50 to \$3 per rod, including Iron Posts from 12 to 16 feet apart.

Inquiries or orders addressed to the Proprietor will meet with prompt attention.

JOHN B. WICKERSHAM,
351 Broadway.

WAREHOUSE—351 Broadway.

WORKS—N. Y. Wire Railing Works, 59 & 61 Lewis st.
AGENTS—C. B. Conant & Co., 215 Pearl st. N. York.

AMERICAN RAILROAD JOURNAL.

Saturday, December 28, 1850.

Virginia--Internal Improvements--Governor's Message.

We have been prevented, by a press of other engagements, from bestowing that early attention to the Annual Message of the Governor of this State, which its importance demanded; and we now take occasion to give an abstract of that portion of it which relates to the internal improvements of that State.

The absolute public debt of Virginia now amounts to \$9,035,839 30; and there remains yet to be paid, on account of her subscriptions to organized companies, the further sum of \$4 632,866 49. Other appropriations, to the amount of \$844,000, have been made to companies not yet organized. Of this last named sum, the Governor thinks that not more than \$367,132 will be called for.

The payment of these sums would increase the debt to \$14,035,839 30. In addition to this, the State is conditionally liable as guaranteeing the bonds of several corporations within her limits, to the amount of \$2,844,374, and has promised further guarantees to the amount of \$1,103,530; making the whole sum for which she is absolutely and conditionally liable, \$17,983,743 30. Almost the whole amount of this debt has been incurred on account of works of internal improvement.

In view of this large debt, the Governor recommends that all further appropriations out of the treasury should be confined exclusively to the great lines of connection with the west begun and under way. The lines are, the James River and Kanawha canal, the Virginia and Tennessee, and the Virginia Central railroads.

While the Governor recommends that no further appropriations should be made but for the objects specified, he says that the improvements already made have exerted a most favorable influence in increasing the value of the landed property of the State. The total value of the lands of the State in 1819 was \$206,893,978; in 1838, \$211,930,508; in 1850, \$274,680,226; the rate of increase from 1819 to 1838 being only 2½ per cent. in 19 years, and from 1838 to 1850, 32½ per cent, being an increase of 30 per cent. in 12 years. While, therefore, the debt of the State is rapidly increasing, the ability of the people to meet the tax to pay the interest arising on it is increasing, perhaps, in still greater ratio.

The immediate object of the construction of the works in which Virginia is engaged, is to develop her resources, and to cheapen and facilitate the transportation of her products. In addition to this, she has in view the ulterior one, of making herself the channel through which shall flow the products of the western States, and of making these the means of building up large commercial cities within her own borders. Norfolk possesses one of the finest harbors on the coast of the United States. It is geographically nearer the centre of Ohio than either Baltimore, Philadelphia or New York, and the message assumes that commercially the same may be made to be true, by the construction, on the part of Virginia, of works similar to those which have the western trade to the cities above named; and it attempts to prove that the James River and Kanawha canal is the appropriate work to accomplish this result. The construction of this canal from Buchanan to the Great Falls of the Kanawha, a distance of 368 miles from Richmond, is already strongly urged upon the Legislature.

To prove the superiority of a canal over a railroad, as an instrument of transportation, Governor Floyd brings forward the success of the New York canals as proof in point, and gives a detailed statement of the progress and business of that great work. He shows the influence it has exerted upon the growth of New York, and anticipates a like result in the growth of Norfolk, whenever the James River and Kanawha canal shall reach the Ohio.—With great deference to so high an authority, we think that he has committed a great error in reasoning from one case to the other, in assuming what remains to be proved, and what is essential to his argument, viz: a similarity of circumstances in the two cases; and in the next place, that because the Erie canal has thus far been the outlet of western produce, it is superior to a railroad as a medium of cheap transportation.

We have very often expressed the opinion, that, while the Erie canal presents an instance of won-

derful success, and has done more than any other work having a similar object, to promote both the foreign and domestic commerce of the country, the very fact of its success had exerted a very injurious influence upon the action of other States. The results which followed the opening of that great work stimulated other States into the construction of works of a similar character. These States, in commencing these works, looked simply at results, overlooking the important fact that the success of this work depends upon conditions peculiar to itself, and not found in connection with any similar one in the country. This connects by the shortest water line, the Atlantic and the great lakes, having an extent of ship navigation of more than a thousand miles, surrounded by the finest portions of the Union, and to which is naturally attracted, and over which passes, a large portion of the products and commerce of the country. The line of this canal presents an almost uniform slope from Lake Erie to Albany, and commands an unlimited supply of water at all times, and from the level nature of the country traversed, is seldom affected by freshets. For the vast trade between these great lakes and tide water, this work has thus far been the only practicable outlet, the legislature of New York protecting it from the competition of railroads occupying the same route. Now no other line possesses advantages that will bear any proportion to this, as far as its connections are concerned. No canal in this country, built or projected, can expect to receive a tithe of the business of the Erie. But its superiority to all others bears no comparison to its superiority of profile, and the peculiar adaptedness of the country traversed for such a work. The whole amount of lockage from Cincinnati to New York, via the Miami and Erie canals is 1239 feet. From Pittsburgh to Philadelphia, via the Ohio river and the Pennsylvania canal, the lockage, or rise and fall, is 4514 feet, and from the Ohio to Richmond, via the route of the James river canal, the rise and fall is about 4000 feet. The New York and Erie canal must therefore, on account of superiority of route, always furnish a cheaper medium of transportation between Cincinnati and the Atlantic coast than any other water route that can ever be constructed south of it.

While the Erie canal has this great advantage over all others in amount of rise and fall, this fact constitutes but a small part of its great superiority. From the nature of the country traversed by this work it is almost entirely free from all danger from injury by freshets. The cost and difficulty of maintaining a canal, increases in vastly greater ratio than its increased ascent. The reason of this is too obvious to need pointing out. The recent disastrous flood on the Schuylkill is sufficient evidence of this fact. But the James river and Kanawha company propose to carry their work over the summit of the Alleghenies at an elevation of about 2,500 feet above tide water. Now we believe that the maintenance of this work, if its completion were practicable, would be found impossible, even with its whole revenues. It is yet a problem whether sufficient water can be obtained for the summit. But we believe that the difficulty from this source would not be half so great as that of protecting the line from the mountain floods. This company have already had some experience of what they will have to contend with, the higher they ascend the mountain. We know of no successful work that has been constructed under the same circumstances.

The experience and opinions of those who have

been engaged in the construction of similar works, should have its proper effect upon the action of this company. The project of a canal from the navigable waters of Virginia to the Ohio, dates back far beyond the introduction of railroads. Now it strikes us that this company have not paid sufficient respect to the progress that has since been made in the science of locomotion. The recent application of newly discovered forces has, within about twenty years, wrought a complete change in the mode of travel and transportation. The canal at the present day is entirely deserted as a route of travel, and in many parts of the country is abandoned as a route of transportation. It is still an undetermined problem, whether, under the most favorable circumstances, a canal can carry cheaper than a railroad. Perhaps the best test that we have had in the relative capacities of the two modes, is to be found in the case of the Reading railroad and the Schuylkill canal, and the contest between these two works has certainly not been to the disadvantage of the railroad. All the canals in Massachusetts have been given up. Pennsylvania has virtually decided against her line of canals, by constructing a railroad parallel to her great work which has cost her so much money. In fact, without multiplying illustrious canals, of any considerable length of line, are now looked upon as belonging to the past, and as not adapted to modern ideas; and no one thinks of commencing a new work of this kind, and only such lines are projected, as require to be finished, to save some portion of the vast outlay which has been made upon them. In Ohio, Indiana, Illinois, not the slightest attention is paid to the canals, in constructing the projected lines of railroad, and the existence of a canal is considered no reason against running a railroad by the side of it. We must not look upon the great change which has within a few years taken place in substituting railroads for canals, as resulting from caprice, but from the conclusions of experience in the use of the two, and as expressing the deliberate sentiment of the community upon their respective utility.

The Governor of Virginia assumes that the capacity of the Erie canal to carry cheaper than a railroad is proved. There is as yet no evidence to show this, because the legislature of this State has never allowed the experiment to be made. In addition to the cost of conveyance, which of course includes the profit upon the capital invested, have been imposed the exorbitant canal tolls upon the only road which could come in competition with it. But the completion of the Ogdensburgh railroad, and the capacity it has shown for cheap transportation, and the early prospective opening of the Erie railroad, has excited great alarm among the friends of the canal. At the present time the capacity of the canal is taxed to the utmost, and any reduction of tolls would reduce the revenue, and thus postpone the work of enlargement. The railroad from Albany to Buffalo can carry at a much less rate than that charged by the canal, and it can carry much cheaper than the Erie canal ever can, and pay a dividend upon its cost. The friends of this work were never in a greater dilemma than at this moment; and no subject in this State is receiving more attention than the question as to the steps proper to be taken to put this great work in condition to meet the rivalry which it must soon encounter, in the lines of railroad which are soon to come in competition with it. Up to this time it has enjoyed an undisturbed monopoly. It must soon be prepared to reduce its tolls at least 33 per cent.,

to retain its business. If this canal, occupying the most favorable route, cannot compete with railroads, how can the James River hope to do so, as a railroad would be certain to follow its extension to the Ohio.

Another great point in favor of railroads, is their greater income upon the amount expended. The extent of line of the James River and Kanawha canal now opened, is 148 miles. The gross receipts of the main line for the year just ended, are \$239,000, equal to about \$1,600 per mile. Now we think that a railroad between Richmond and Lynchburg, without any competing work, would have earned at least \$4,000 per mile. The Baltimore and Ohio railroad in the current year has earned at the rate of about \$7,000 per mile, gross. The Western railroad has earned \$8,600 per mile. The stock in the James River company has all been lost. We believe that if a railroad had been built in its place, it would have been good property. This work barely earns sufficient to pay the interest on its indebtedness. If it should be extended beyond Buchanan, would it do as much as this?

Again, this work has completely failed to give a decided impulse to the public mind of Virginia.—Lynchburg has done but little more than hold its own since the canal was opened. With a railroad instead, it would have now contained treble its present population. Towns would have sprung up upon its line. Richmond would have increased vastly more than she has done; in short, we should have witnessed here the same magic change which always manifests itself, wherever railroads are constructed. Railroads attract people, because every person who resides by one, feels himself to be in the world; that he himself is a part of society. It enables him to mingle with his fellow men at will.—Canals give no such facility. They are not adapted to social intercourse. Hence the only result that flows from them is simply an immaterial one.

The completion of the James river canal to the Ohio has long been a favorite project with Virginia. But she should not suffer her fondness for this, control her judgment. We are fully satisfied that she should not attempt to push this work beyond Buchanan, but that the connection with the Ohio should be made by a railroad over the mountains. The example of Pennsylvania, and the enormous debt of that State, should teach her to avoid the mistakes of the former, before it is too late to retract.

New Railroad Route from New York, West.

A new route from this city, west, to be formed by an extension of the Morris and Essex railroad, to the Delaware Water Gap, thence by a road in a northwesterly direction, to the southern terminus of the Leggett's Gap railroad, and by the last named road to Elmira, on the Erie railroad, is now attracting much attention. The distance from N. York to Elmira by this route is stated to be as follows:—From New York to the Water Gap 85 miles; from the Water Gap to the Leggett's Gap railroad 45 miles, and from the Leggett's Gap railroad to Elmira 64 miles, making the whole distance 194 miles, against 283 miles by the Erie, between the same points.

The Morris and Essex railroad, which forms the first part of this line, is already in operation to Dover, New Jersey, a distance of 45 miles. A survey for the extension to the Water Gap has been made, showing a very favorable route. The construction of this extension will, without doubt, be immediately commenced. The Leggett's Gap railroad is also in progress, leaving but 45 miles to be provided for. This is the portion between the Delaware

river and the Leggett's Gap railroad. From the best information which we have been able to obtain, we believe that this portion of the line presents no serious obstacles to the easy construction of a railroad.

If the above distances are correctly stated, and they appear to be well vouched, the above project becomes of great importance to New York as an additional and shorter route to the west, in addition to the great local advantages to be derived from it. It would open another avenue to the coal fields of Pennsylvania, and the present high price of coal, for the lack of such avenues, shows its importance in this respect. The agricultural resources of the country on the above route are very considerable, and would furnish a further supply to our markets. Immediate steps will be taken, we presume to bring this project before the public in a connected shape. If it shall turn out to be as favorable as it has been represented, both as regards distance and facilities for construction, we may regard its accomplishment certain at no very distant day.

Virginia.

Richmond and Danville Railroad.—From the recent report of Mr. Tunstall, President of the above company, we learn that the portion of the road to the Chesterfield coal mines has been completed.—It was expected the road would be completed to the Appomattox river by this time, but the company has been disappointed in this, by the failure to receive the iron ordered from England several months ago. This, however, will soon arrive, and the work of laying the superstructure will be immediately commenced.

The progress of the road has been much delayed by the want of punctuality among the stockholders in paying their assessments. The President states that there is now due on the requisition of last October, \$55,000 for private subscriptions, dependent upon which is \$82,500 due from the State, making the sum of \$137,500 called for in October and yet unpaid.

In reference to the amount necessary to be raised to complete the work, the report says:

"There remains yet to be raised by individual subscription, the sum of about seventy-eight thousand dollars, to complete the private capital of this company, which, with the additional amount of one hundred and fifteen, dependent thereon from the State, would give us the sum of near two hundred thousand. The guaranteed bonds of this company, under the act of the last Legislature, will procure a sufficient quantity of heavy rail to reach some seventy miles, and the iron and timber already purchased and paid for will reach Danville. The money to be subscribed, therefore, is principally for grading the road."

The report favors the location of the road as far north as the interests of the work will allow, with a view of securing its connection with the Virginia and Tennessee railroad at Lynchburg, and also recommends an extension of the road into North Carolina so as to connect it with the Central road of that State.

Canada.

Toronto and Lake Huron Railroad.—Contracts for the construction of this road have recently been concluded with M. C. Story & Co., well known contractors of this State. The engineering department is to be superintended by H. C. Seymour, Esq., at present State Engineer of New York. The road is to be about 80 miles long, and is estimated to cost \$25,000 per mile, or \$2,000,000 in the aggregate. Of this sum, the contractors take one-quarter. A like sum has been raised in cash subscriptions. The balance will be furnished by the Provincial guaranty.

The success of this project is mainly attributa-

ble to F. C. Capreol, Esq. of Toronto, who has labored most assiduously in its behalf from the outset, under every discouragement, from the opposition of some, and the lukewarmness of the great mass, who were to be benefitted by the success of the work. We are glad to see that success has at last crowned his efforts.

The road is a very important one to the traveling and business public, as it connects Lakes Ontario and Huron, by a line not much exceeding 80 miles—thus saving the long circuit by Niagara Falls and Lake Erie.

New Hampshire.

Cocheco Railroad.—At a meeting of the stockholders of the Cocheco railroad, held on the 16th inst., it was voted, with great unanimity, to authorize the directors to issue an eight per cent preferred stock, to an amount not exceeding \$250,000, for the purpose of completing the road to Alton Bay. This stock is nearly all taken up, and contracts for grading the road to the bay have been made, and the contractors are at work. It is the intention of the directors to have the road completed by the first of July next.

Connecticut.

New Haven and New London Railroad.—Contracts have concluded for the construction of this road. The distance from New Haven to New London is fifty miles; from New London to Stonington, 12 miles, to which the road will probably be extended; making the distance between New York and Boston by this route 231 miles against 238 by way of Springfield.

We published some time since a copy of the report of the survey of this route. It will run thro' a number of thriving villages, and will connect New York with a number of important points not now easily accessible by railroad, and will form a continuous route between this city and Providence, a matter of no small importance. At New London it will connect with the New London, Willimantic and Palmer railroad, extending to the western railroad, at the latter place, a distance of 66 miles; also with the Norwich and Worcester, and will form a trunk line for both of these, as well as the Stonington railroad to New York.

The project is one of great public utility, and we see no reason why it may not be profitable to those engaged in its prosecution.

Maine.

York and Cumberland Railroad.—This important line of railway, in the Maine system of public improvements, is now going forward with favorable assurances of success, and only needs proper encouragement from the city of Portland to become one of the most profitable sources of wealth to that city.

As an interior trunk line to Boston, from Portland and the east, it has the same advantage over its natural rival, the Portland, Saco and Portsmouth railroad, and to the same extent, as the Boston and Maine railroad possesses over the Eastern. But this is a portion only of the advantages of this line.

Burlington, on Lake Champlain, can by railway reach the seaboard at Portland in a line from 40 to 60 miles less than the distance to Boston. By extending a branch line from Gorham to the line of the Boston, Concord and Montreal railroad of New Hampshire, a direct connection would be formed between Burlington and Portland, as soon as the lines shall be extended between Plymouth and Montpelier.

The first division of the York and Cumberland

railroad, extending from Portland to Gorham, a distance of 11 miles, is to be opened the present month, and the work has been commenced at Great Falls, extending in the direction of Alfred.

This company, in conjunction with the Kennebec and Portland railroad company, have just finished a most elegant and substantial depot on the cove side of the city of Portland.

This depot is an ornament to the city, and one of the most elegant structures of the kind in the country. It is 100 feet wide in the clear (with 10 feet projections for awnings on each side), by 250 feet in length, with 22 feet posts, the roof supported by a truss. The suits of rooms and offices are taken off from the eastern end of the building, occupying 30 feet, giving inside a spacious room 220 feet long by 100 feet wide, and 22 feet high to the bottom of the stringers.

This building is by many regarded as one of the finest specimens of railway architecture in the country. It reflects the highest credit upon A. P. Robinson, Esq., Chief Engineer of the company, and upon the Messrs. Clapp, the builders. These gentlemen, the leading capitalists of Maine, have recently filled up some twenty acres of flats on Back cove, in the centre of which stands this fine structure, built by them for the companies on land conveyed by them for the purpose. The depot is to be hereafter extended so as to occupy a square of 500 feet in length, with streets of the width of 80 feet on each side of it.

These extensive improvements of the Messrs. Clapp seem to promise the most satisfactory results.

Notice to Contractors.

COVINGTON AND LEXINGTON RAILROAD.—Sealed Proposals will be received at the office of the Covington and Lexington Railroad Company, in this city, until the seventh day of January next, for grading eighteen (18) miles of the Covington railroad, commencing at the proper end of section No. twenty, (20) near E. Clarkson's house, and extending up the valley of the Licking river, and along the left or Western bank to the town of Falmouth, in Pendleton county. The proposals will include all the excavations and embankments, and the masonry for culverts; also the masonry for bridges.

Plans and specifications of the work to be done and the terms of payment may be seen at the office of the Company, at any time between the twenty-seventh of December and the seventh of January.

SYLVESTER WELCH,

Engineer Covington and Lexington Railroad.
Office of the Covington and Lexington Railroad,
Covington Ky., Nov. 25th, 1850.

Notice to Contractors.

ENGINEER'S OFFICE E. T. AND V. A. R. R. CO., }
Jonesborough, Nov. 30th, 1850.

SEALED PROPOSALS for the graduation and masonry of forty miles of the East Tennessee and Virginia Railroad will be received at the Office of the Chief Engineer, Greenville, Greene County, E. Tenn., until the 15th day of January next.

A fine opportunity here presents itself to good contractors. Labor and supplies abundant and cheap, the country remarkably healthy, and every opportunity for the successful prosecution of the work.

This link of forty miles commences at McBee's Ferry, on Holston River, 15 miles east of Knoxville, and extends to Bull's Gap.

A fine variety of work will be offered, and experienced contractors would do well to give it their attention.

Specifications, maps, profiles, &c., &c., will be in readiness for the inspection of contractors by the 25th of December.

By order of the Board,
LLOYD TILGHMAN,
Chief Engineer.

India-rubber Goods for Rail Road Purposes.

THE Goodyear Metallic India rubber Co., (F. M. Ray, Agent) No. 104 Broadway, New York, (1 door from Pine street) has on hand and offers for sale at the lowest prices, an extensive assortment of Rubber Goods suitable for Railroad Companies, such as Hose of all sizes, Fire Buckets, Water Pails, Steam Packing, Car Covers, Tarpaulins, Clothing of all kinds for brakemen, switchmen, etc. Belting, and many other articles—all manufactured from Goodyear's Metallic India-rubber, and warranted to give satisfaction.

India-rubber HOSE is in use upon many railroads, for Tanks and Water Stations. It requires no oiling, is unaffected by heat or cold and is in every respect a most desirable article, and much superior to leather. All sizes, from 1 in. to 6 in., or larger if needed, made to order.

The reputation of India-rubber for steam packing is well established, and it is now almost universally preferred to any other kind of packing. It will stand a higher degree of heat and last longer than any other substance. An assortment of every thickness from 1-32d in. 1½ in. always on hand.

Every article sold by the Goodyear Metallic India-rubber Co. is warranted, and will be offered to railroad companies at the lowest factory prices.

The Goodyear Metallic India-rubber Co. is a connection of the New England Car Co., and in addition to its large stock of goods for railroad and other purposes, has on hand a large assortment of F. M. Ray's Patent India-rubber Car Springs, both bearing and buffer, of all sizes.

Railroad Letting in Ohio.

Bellefontaine and Indiana Railroad.

SEALED PROPOSALS will be received at Jacksonville, Darke county, Ohio, (known also as Versailles), until January 21st, 1851, for doing the Grubbing, Clearing and Grading on 25 miles from Loramie Creek to the junction with the "Indiana and Bellefontaine Railroad" at the Indiana State Line. Profiles are now ready at the Engineer's Office in Sidney, Shelby county, Ohio, where information can be obtained from Israel Pemberton, Resident Engineer. Proposals may also be left at Sidney till the 20th of January.

SEALED PROPOSALS will also be received at Marion, Ohio, until February 5th, 1851, for doing the Grubbing, Clearing and Grading on about 40 miles between Marion and Bellefontaine. The work, and profiles on this division, will be ready ten days before the letting. Information can be obtained from Alexander Worrall, Resident Engineer, at Bellefontaine, and at the Chief Engineer's Office in Marion.

The above are the only portions on the route not yet under contract. This road is known as the "third link" in the "great central backbone chain" from Philadelphia to St. Louis, and likewise as the western continuation of the main lines from Boston and New York, through Cleveland.

By order of the Board of Directors.

W. MILNOR ROBERTS,
Chief Engineer.

Engineer's Office, Marion, Ohio, }
December 10, 1850. }

Jones' Empire Ink.

THE following are the net prices for the trade—and cheapest:

Quarts, per dozen,	\$1 50	6 oz. per dozen,	\$0 50
Pinta, " "	1 00	4 " " "	0 37½
8 ounces, " "	0 63	2 " " "	0 25

This is the best article of the kind manufactured—it is black when first used—and although very free flowing, is a first rate copying ink.

All orders promptly attended to, directed to the

EXCELSIOR AGENCY, 85 Nassau st.

Tubes. Tubes. Tubes.

THE Undersigned have received special permission from, and are in direct communication with, THE BIRMINGHAM LAP WELDED IRON TUBE COMPANY, for the sale of their very excellent and superior Boiler and Gas Tubes in large or small quantities. These Tubes are used very extensively both in England and the continent of Europe, and sold exclusively by

WILLIAM BIRD & CO.,
Iron and Tin Plate Merchants,
44 Wall st., New York.
5 Martin's Lane, City, London.
and 140 Buchanan st., Glasgow.

December 13, 1850.

Great Work on Bridge Building, etc., etc.

JUST published in medium folio, One Dollar, 75 cts. to subscribers.

Part IV of a "THEORETICAL AND PRACTICAL TREATISE ON THE CONSTRUCTION OF BRIDGES IN STONE, IRON AND WOOD," including the Equilibrium of Arches, the mathematical principles of the Oblique Arch, Suspension Arch, etc., Construction of Foundations in Water, Centering, Oblique Arches, etc., the application of Iron to Railroad Structures, Practical Tunnelling, Suspension Bridges, etc.; illustrated by numerous accurately executed Plans, Elevations, Sections and Details of Stone, Iron and Wood Bridges, Viaducts, Tunnels, Culverts, Machines, etc., constructed by the most eminent Architects and Engineers in Europe and the United States, and numerous Original Designs for Bridges, Viaducts, Culverts, etc. The whole calculated to meet the exigencies of Engineers, and assist Draughtsmen, Bridge Builders, Mechanics and Students. By George Duggan, Architect and Civil Engineer.

The present part contains beautifully executed plans, elevations, sections, and details of the Iron Lattice Bridge 140 feet span over the canal in the suburbs of Dublin on the line of the Dublin and Drogheda R.R., Plans, elevations and sections of the Timber Bridge over the Schuylkill, at Market st., Philadelphia, with Arches 160 and 190 feet span. Plans, elevations and sections of a Timber Bridge with Arches 155 and 200 feet span over the Delaware. Also, plans, elevations, sections and details of Lattice and Frame Wood Bridges, explanatory of Nathaniel Towns and Colonel S. H. Long's methods of constructing Bridges of Wood, with the continuation of the Articles on Cofferdams, Concrete, Limes, Mortars, Cements, etc.

Published by George Duggan, 300 Broadway, New York, to whom all communications should be addressed and subscriptions forwarded.

Parties remitting Mr. Duggan \$5. and the remainder \$4 when they have been supplied with the first six parts of the "Theoretical and Practical Treatise on Bridge Building, etc." shall receive it monthly as published. To those making Mr. Duggan a present remittance of \$9, the work will be forwarded post free to any part of the United States.

Great American Engineering

AND MECHANICAL WORK, just published in medium folio One Dollar, 75 cts. to Subscribers.

Part X. of "Specimens of the Stone, Iron & Wood Bridges, Viaducts, Tunnels, Culverts, &c., &c., of the United States Railroads." By George Duggan, Architect and Civil Engineer.

The present part contains beautifully executed plans, elevations, and sections of the Timber Bridge with Arches 136 feet span, over the Mohawk river, on the line of the Utica and Schenectady R.R. Plans elevations, sections and isometrical views of Timber Piers 100 feet high a Timber Bridge of 55 feet span, and Ice Breakers, on the line of the Little Schuylkill and Susquehanna R.R.

Also plans, elevations, sections, isometrical views and details of an Iron Bridge 856 feet long, with Arches 70 feet span, erected by the N. York Iron Bridge Co. over Morris Creek, on the line of the Virginia Central R.R., and plans, elevations and sections of an Iron Plank Road Bridge 160 feet span, erected over Buffalo creek by the same company, with a description of Col. Long's method of constructing Bridges in Iron, and an explanation of the causes that led to the failure of the Iron Bridge 60 feet span, near Lackawaxen, on the line of the New York and Erie R. R., at midday, on the 31st July last, by which several lives were lost, and a great amount of property destroyed.

Published by GEORGE DUGGAN, 300 Broadway, New York.

To whom all communications should be addressed and subscriptions forwarded.

Railroad Lanterns.

COPPER and Iron Lanterns for Railroad Engines, fitted with heavy silver plated Parabolic Reflectors of the most approved construction, and Solar Argand Lamps; manufactured by

HENRY N. HOOPER & CO., No. 24 Commercial St. Boston.

August, 16, 1849. 6m33

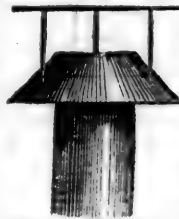
Gas Fixtures.

FIXTURES for Burning Gas for Lighting Public Buildings, Private Dwellings, Stores and Factories, manufactured by the subscriber in great variety. Orders by Mail, or left at the Factory on Causeway street, will be promptly attended to.

HENRY N. HOOPER & CO. Boston, March 23, 1850. 6m13

Emerson's Patent Ventilator,

ADAPTED to Cars, Engine houses, Public Halls, Factories, Churches, School Houses, Dwellings, Chimney Flues, etc.



This Ventilator is stationary, and cannot get out of order. It is constructed in such conformity to cert in ascertained laws of pneumatics, as to insure a constant draft outward, whatever may be the changing direction of the wind. The Massachusetts Mechanic Association have awarded a gold medal to the Inventor, and the Manufacturers have already disposed of over 3,000 of the article. Manufactured and sold by CHILSON, ALLEN, WALKER & Co., 351 Broadway, New York.

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MANUFACTURERS OF

Plane Irons, Tooth Irons, Soft Moulding and Rabbit Irons, Cornice Irons, Plow Bits, and Planing Machine Knives:

NUTS, WASHERS AND BOLTS.

—ALSO—

PLATE HINGES AND PICK AXES.

They are prepared to execute orders for all descriptions of Cold Punching and Job Work.

WM. FIELD, Agent. RUFUS WATERMAN, Treas. PROVIDENCE, R. I.

Ibbotson, Brothers & Co's CELEBRATED CAST STEEL

AND

Best Cast Steel Royal Improved Files, well known as better adapted for Engineers' and Machinists' purposes than any now in use in the United States.

Every description of Square, Octagon, Flat and Round Cast Steel, Sheet, Shovel and Railway Spring Steel, etc., and Steel to order for any purposes—manufactured at their works in Sheffield—and universally known by the old stamp "Globe."

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Faggotted Car and Engine Axles

FORGED by RANSTEAD, DEARBORN & Co., Boston, Mass.

These Axles enjoy the highest reputation for excellence, and are all warranted.

American Cast Steel.

THE ADIRONDAC STEEL MANUFACTURING CO. is now producing, from American iron, at their works at Jersey City, N.J., Cast Steel of extraordinary quality, and is prepared to supply orders for the same at prices below that of the imported article of like quality. Consumers will find it to their interest to give this a trial. Orders for all sizes of hammered cast steel, directed as above, will meet with prompt attention. May 28, 1849.

To Contractors.

SCIOTO AND HOCKING VALLEY RAILROAD. Sealed Proposals will be received at the Railroad Office in Portsmouth, Ohio, until the first day of January, A. D. 1851, for the Grading, Masonry and Bridging of 25 miles of the above road—20 miles extending from Portsmouth to the 20th mile Post, two miles east of Bloomfield, Scioto county, and five miles extending from Jackson, Jackson county, southerly to station number 2046. The character of the work is such as is usually found in the State, consisting of about 30 sections of Grading, varying from five to eighty thousand cubic yards.

Plans and specifications will be ready for examination after the 15th day of December next, and the line ready for inspection after about the 20th of December.

Contractors proposing for the Bridging may bid according to plans furnished by the Engineer, or according to plans furnished by themselves.

By order of the Board of directors. J. V. ROBINSON, President. J. W. WEBB, Chief Engineer. Scioto and Hocking Valley R. R. Office, Portsmouth, Nov. 19, 1850.

American Railway Guide.

This is the best Guide Book for Travellers now in use. It is carefully revised and corrected monthly, and contains valuable tables giving information of Southern, Western and Eastern routes, not to be found in any other publication.

CURRAN DINSMORE, Publisher, 138 Fulton st., New York.

Sold on many of the principal Railroads in the United States, and at the Periodical Depots.

The "American Railway Guide" * * will be found to contain just the information which every traveller needs with regard to the departure and arrival of trains.—[N. Y. Tribune.]

It would be difficult to devise or execute a more convenient or perfect work of its class. * * —[Hunt's Merchants' Magazine.]

This supplies information desirable for every business man who is obliged to travel, and he can carry the book conveniently in his pocket, for reference at all times.—[Philadelphia Ledger.]

The most complete and accurate guide ever published.—[Scientific American.]

It is the best and cheapest book of the kind ever issued.—[Sunday Dispatch.]

NOTICE

For Proposals for Railroad Iron, for the Alabama and Tennessee River Railroad,

TO BE MANUFACTURED FROM ALABAMA ORE.

THE Alabama and Tennessee River Railroad Co. invite proposals, until the 1st of January, 1851, for Iron Rails, to be made of Alabama Iron, for the Northern Division and part of the Southern Division of their road, embracing a distance of about 105 miles. The rails are to be of the H pattern, in lengths of 18 feet, and weighing 63 lbs. per lineal yard. They are to be delivered on the Coosa river, at a landing to be hereafter designated, between Kimulgee ferry and Fort Williams, commencing their delivery on the 1st of November, 1851, and continuing it at the rate of from 60 to 100 tons per week, until the whole quantity required (10,500 tons) shall have been delivered. They are to be inspected by Lewis Trost, Chief Engineer.

It is proper to state to iron masters and capitalists at a distance, that the country traversed by the Northern and part of the Southern divisions of the road abounds in excellent iron ore and bituminous coal, and possesses every advantage for the successful manufacture of iron, health, cheap labor and provisions.

Further information may be obtained by addressing the President of the Company at Selma, Ala.

By order of the Board of Directors.

J. W. LAPSLEY, President.

Boardman's Patent Improved Steam Boiler and Furnace.

THE Patentee is now prepared to sell single or territorial rights to the use of the above named improvement. Recent experiments have demonstrated that this form of Boiler effects a saving of one-half the fuel required to run the best Cylinder Boiler with return flues, and about 40 per cent. of the amount used by Locomotive Boilers. The heat is so thoroughly applied to the water that the temperature in the chimney is reduced below 140 deg. The smoke and combustible gases are consumed within the furnace. The refuse gas instantly extinguishes flame or sparks, so that all danger from sparks is avoided. This Boiler is very compact in form, occupying less space than any other of like power.

References—Thomas H. Faron, Chief Engineer U. S. Mail Steamer Arctic, N. Y.; Messrs Mott & Ayres, and Mr. D. F. Jaycox, Chelsea Iron Works, 26th street N. Y.; Messrs. Tugnot, Dally & Co., Franklin Forge, 1st avenue, N. Y.; Mr. John Mills, Machinist, 319 5th street, N. Y.; Mr. W. C. Smith, St. Albans, Vermont; and Messrs. Goulding, H. BOARDMAN, 123, Fulton-st. N. W.

Railroad Iron.

THE "Montour Iron Company" is prepared to execute orders for Rails of the usual patterns and weights, and of any required length not exceeding 30 feet per rail. Apply at the office of the Company, No. 74 South 3d st., Philadelphia.

Or to the Agents, CHOUTEAU, MERLE & SANFORD, NO. 51 New st., New York.

September, 1850.

ENGINEERS.**Atkinson, T. C.,**

Alexandria and Orange Railroad, Alexandria, Va.

Banks, C. W.,

Civil Engineer, Vicksburg, Miss.

Buckland, George,

Troy and Greenbush Railroad.

Clement, Wm. H.,

Little Miami Railroad, Cincinnati, Ohio.

Cozzens, W. H.,

Engineer and Surveyor, St. Louis, Mo.

Alfred W. Craven,

Chief Engineer Croton Aqueduct, New York.

Davidson, M. O.,

Eckhart Mines, Alleghany Co., Maryland.

Fisk, Charles B.,

Cumberland and Ohio Canal, Washington, D. C.

Felton, S. M.,

Fitchburgh Railroad, Boston, Mass.

Floyd-Jones, Charles,

South Oyster Bay, L. I.

Gzowski, Mr.,

St. Lawrence & Atlantic Railroad, Montreal, Canada.

Gilbert, Wm. B.,

Rutland and Burlington Railroad, Rutland, Vt.

Grant, James H.,

Nashville and Chattanooga R. R., Nashville, Tenn.

S. W. Hill,

Mining Engineer and Surveyor, Eagle River, Lake Superior.

Holcomb, F. P.

Southwestern Railroad, Macon, Ga.

Johnson, Edwin F.

New York and Boston Railroad, Middletown Ct.

Latrobe, B. H.,

Baltimore and Ohio Railroad, Baltimore, Md.

Miller, J. F.,

Worcester and Nashua Railroad, Worcester, Mass.

Morris, Elwood,

Schuylkill Navigation, Schuylkill Haven, Pa.

Morton, A. C.,

Atlantic and St. Lawrence Railroad, Portland, Me.

McRae, John,

South Carolina Railroad, Charleston, S. C.

Nott, Samuel,

Lawrence and Manchester Railroad, Boston.

Prichard, M. B.,

East Tennessee and Georgia R. R., Cleveland, Tenn.

Roebbing, John A.,

Trenton, N. J.

W. Milnor Roberts,

Bellefontaine and Indiana Railroad, Marion, Ohio.

Roberts, Solomon W.,

Ohio and Pennsylvania Railroad, Pittsburgh, Pa.

Sanford, C. O.,

South Side Railroad, Virginia.

Schlatter, Charles L.,

Northern Railroad (Ogdensburg), Malone, N. Y.

Sours, Peter,

Rahway, New Jersey.

Stark, George.,

Bost., Con. and Mont. R. R., Meredith Bridge, N. H.

Steele, J. Dutton,

Pottstown, Pa.

Trautwine, John C.,

Panama Railroad—Address through office of Panama Railroad Co., 78 Broadway, N. Y.

Trimble, Isaac R.,

Philad., Wil. & Baltimore Railroad, Wilmington, Del.

Tinkham, A. W.,

United States Fort, Bucksport, Me.

Thomson, J. Edgar.,

Pennsylvania (Central) Railroad, Philadelphia.

Troost, Lewis,

Alabama and Tennessee Railroad, Selma, Ala.

Whipple, S.,

Civil Engineer and Bridge Builder, Utica, N. Y.

Williams, E. P.,

Auburn and Schenectady Railroad, Auburn, N. Y.

Williams, Charles H.,

Milwaukee, Wisconsin.

HOTELS.**Exchange Hotel,**

Adjoining Eastern Railroad Depot,

BUFFALO, N. Y.

BY.....**FISK & SPERRY,**

Late of Delevan House, Albany.

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NO. 300 MAIN STREET,

BUFFALO, N. Y.

Fountain Hotel,

LIGHT STREET, BALTIMORE,

P. THURSTON.....Proprietor.

DUNLAP'S HOTEL,

On the European Plan,

NO. 135 FULTON STREET,

Between Broadway and Nassau St.,
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Corner of Maine and Exchange Streets,

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GUY'S**United States Hotel,**

(Opposite Pratt street Railroad Depot.)

BALTIMORE.

JOHN GUY.

WILLIAM GUY.

American Hotel,

Pratt street, opposite the Railroad Depot,

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HENRY M. SMITH.....Proprietor.
Late of the Exchange & St. Charles Hotels, Pittsburgh.**Washington Hotel,**

BY JOHN GILMAN.

\$1 Per Day.

No. 206 Pratt street, (near the Depot),
BALTIMORE.**Barnum's City Hotel,**

MONUMENT SQUARE, BALTIMORE.

This Extensive Establishment, erected expressly for a Hotel, with every regard to comfort and convenience, is situated in the centre and most fashionable part of the city, and but a few minutes' walk from the Railroad Depots and Steamboat Landings.

The House has lately undergone a thorough repair, embracing many valuable improvements, and will accommodate 250 Guests. **BARNUM & CO.****JONES' HOTEL,**

NO. 152 CHESTNUT STREET,

PHILADELPHIA.

BRIDGES & WEST, Proprietors.

BUSINESS CARDS.**Lithography.****JOHN P. HALL & CO.,**

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Are prepared to execute all kinds of Lithography in good style and at reasonable rates. Particular attention will be paid to Engraving Railroad Maps, Engineer's Plans and drafts, etc., and orders in this line are respectfully solicited.

Cumberland, (Md.) Coals for Steaming, etc.ORDERS RECEIVED FOR AND FILLED
by **J. COWLES, 27 Wall St., N. Y.****Cumberland Steam Coal,**

FROM THE

FROSTBURG MINES, MD.**H. A. TUCKER,**

Agent of Frostburg Coal Co.

No. 50 Wall Street, New York.

Henry I. Ibbotson,

IMPORTER of Sheffield and Birmingham Goods.

Also, Agent for the Manufacture of Telegraph Wire.
218 PEARL ST., NEW YORK.**Charles T. Jackson, M. D.,**

STATE ASSAYER, late Geologist to Maine, Rhode Island, New Hampshire, and the United States, offers his services to his friends and the public in making any Chemical, Mineralogical or Geological researches that may be required for the improvement of Agriculture and the Manufacturing Arts. Particular attention will be paid to the exploration of mines and to assaying of ores of the metals.

State Assayer's office, 31 Somerset st.
Boston Sept. 3, 1850.**STEEL AND FILES.****R. S. Stenton,**

20 CLIFF STREET, NEW YORK,

AGENT FOR

J. & RILEY CARR,

BAILEY-LANE WORKS, SHEFFIELD,

Manufacturers of Cast, Shear, German, Blister, and

Spring Steel,

Of all descriptions, Warranted Good.

FILES.

Manufacturers of Machinists' Warranted Best Cast Steel Files, expressly for working upon Iron and Steel, made very heavy for recutting.

A full Stock of Steel and Files at all times on hand. 6m4

Walter R. Johnson,

CIVIL AND MINING ENGINEER AND ATTORNEY for Patents. Office and Laboratory, F St., opposite the Patent office, Washington, D. C.

Dudley B. Fuller & Co.,

IRON COMMISSION MERCHANTS,

No. 139 GREENWICH STREET,

NEW YORK.

Manning & Lee,

GENERAL COMMISSION MERCHANTS,

NO. 51 EXCHANGE PLACE,

BALTIMORE.

Agents for Avalon Railroad Iron and Nail Works, Maryland Mining Company's Cumberland Coal 'CED'—'Potomac' and other good brands of Pig Iron.

Samuel Kimber & Co.,

COMMISSION MERCHANTS

WILLOW ST. WHARVES, PHILADELPHIA.

AGENTS for the sale of Charcoal and Anthracite Pig Iron, Hammered Railroad Car and Locomotive Axles, Force Pumps of the most approved construction for Railroad Water Stations and Hydraulic Rams, etc., etc.

July, 27, 1849.

James Herron, Civil Engineer,

OF THE UNITED STATES NAVY YARD,

PENSACOLA, FLORIDA.,

PATENTEE OF THE

HERRON RAILWAY TRACK.

Models of this Track, on the most improved plan, may be seen at the Engineer's office of the New York and Erie Railroad.

PLUSHES**Railway Cars & Omnibuses.**

F. S. & S. A. MARTINE,
112 WILLIAM ST., NEAR JOHN.

ARE now receiving a large and complete assortment of Plain and Figured **PLUSHES**, of their own importation, which will be sold at the lowest market price, viz: Crimson, Maroon, Scarlet, Green, Blue, Purple, etc.

ALSO—**CURLED HAIR**, the best manufactured in market.

**To Railroad Companies,
Machinists, Car Manufacturers, etc., etc.**

CHARLES T. GILBERT,
NO. 80 BROAD ST., NEW YORK.

IS prepared to contract for furnishing at manufacturer's prices—

Railroad iron,
Locomotive Engines,
Passenger and Freight Cars,
Car Wheels and Axles,
Chairs and Spikes.

Orders are invited; and all inquiries in relation to any of the above articles will receive immediate attention.

**Manufacture of Patent Wire
ROPE AND CABLES,**

For Inclined Planes, Suspension Bridges, Standing Rigging, Mines, Cranes, Derrick, Tilters, &c., by
JOHN A. ROEBLING, Civil Engineer,
TRENTON, N. J.

FORGING.

Ranstead, Dearborn & Co.,

MANUFACTURERS OF
LOCOMOTIVE CRANKS AND CAR AXLES,

ALSO
WROUGHT IRON SHAFTING,
And All Kinds of Hammered Shapes.
Office 25 Foster's Wharf, Boston.

Samuel D. Willmott,

MERCHANT, AND MANUFACTURER OF
CAST STEEL WARRANTED SAWS,
—AND FILES—

IMPORTER OF THE
GENUINE WICKESLY GRINDSTONES
NO. 8 LIBERTY STREET,
NEW YORK.

Railroad Instruments.

THEODOLITES, TRANSIT COMPASSES,
and Levels, with Fraunhoffer's Munich Glasses,
Surveyor's Compasses, Chains, Drawing Instruments, Barometers, etc., all of the best quality and workmanship, for sale at unusually low prices, by
E. & G. W. BLUNT,
No. 179 Water St., cor. Burling Slip.

New York, May 19, 1849.

IRON.**Iron.**

Pig Iron, Anthracite and Charcoal; Boiler and Flue Iron, Spring and Blistered Steel, Nail Rods, Best Refined Bar Iron, Railroad Iron, Car Axles, Nails, Stove Castings, Cast Iron Pipes of all sizes, Railway Chairs of approved patterns for sale by
COLEMAN, KELTON & CAMPBELL,
109 N. Water St., Philadelphia.

Stickney & Beatty,

DEALERS IN IRON AND IRON
MANUFACTURERS.

AGENTS for the Balt. City Rolling Mill, from which establishment they are prepared to furnish Ellicott's round, square, and flat bar iron, puddled and charcoal boiler plates and billet iron—also agents for the sale of the Laurel, Gunpowder and Locust Grove (Balt.) forge pig iron, Locust Grove and Laurel Irons for car wheels, Caledonian boiler blooms made from cold blast iron, Old Colony and anti-Kalam nails, Win. Jessop & Son's steel, Coleman's blister steel and nail rods, sheet, hoop, band, oval and common English iron.

No. 18 and 20 South Charles st., Baltimore.

Car Wheel Iron.

100 Tons "Columbia" No. 2 Cold Blast Charcoal Iron.

300 Tons "Sallisbury" No. 1, do. do.
For sale by **CHARLES T. GILBERT,**
No. 80 Broad st.

New York, Sept. 21, 1850.

Railroad Spikes.

THE subscribers are prepared to make and execute contracts for Railroad Spikes of a superior quality, manufactured by the New Jersey Iron Company, at Boonton.
DUDLEY B. FULLER & CO.,
139 Greenwich st. corner of Cedar.

Railroad Iron.

1650 Tons, weighing about 61 lbs. per yard, 40 tons, weighing about 52 lbs. per yard, and 825 tons, weighing about 53½ lbs. per yard, of the latest and most approved patterns of T rail, for sale by
BOORMAN, JOHNSTON & CO.,
119 Greenwich street.

New York, Aug. 26, 1850.

N.B.—B. J. & Co. are also prepared to take contracts for English rails, delivered in any of the Atlantic ports of the United States.

Railroad Iron.

THE Undersigned, Agents for Manufacturers, are prepared to contract to deliver Rails of superior quality, and of any size or pattern, to any ports of discharge in the United States.
COLLINS, VOSE & CO.,
74 South St.

New York, June 1, 1850.

Railroad Iron.

1,500 Tons weighing 53 lbs. per lineal yard.
500 " " 57 " "
500 " " 56 " "
500 " " 60 & 61 lbs. "

Also 2½ flat rails. All the above being of approved patterns. For sale by
DAVIS, BROOKS, & CO.,
68 Broad street.

N.B.—Rails imported on commission, or at a fixed price.

Railroad Spikes, Boiler Rivets, etc.

THE Subscribers, Agents for the sale of James S. Spencer's, Jr., Railroad and Boat Spikes, Boiler Rivets, and Wrought Iron Chairs for Railroads, made at his Works near this city, will execute all orders with promptness, despatch, and of the best quality.

ALSO IMPORTERS of English refined and Merchant bar Iron; Extra refined Car and Locomotive Axles (from 3½ to 6½ inches in diameter); B. O. Locomotive Tire (welded by Baldwin). Also, supply Boiler and Flue Iron cut to pattern or otherwise.—Spring, Shear, and Cast Steel, etc., etc.

T. & E. GEORGE.

Philadelphia, November 14, 1850.

Railroad Iron.

THE UNDERSIGNED, HAVING made arrangements abroad, are prepared to contract for the delivery of Foreign rails, of approved brands upon the most favorable terms.

They will also make contracts for American rails, made at their Trenton works, from Andover Iron, in whole or in part, as may be agreed upon.

They are prepared to furnish Telegraph, Spring and Market Wire; Braziers and Wire Rods; Rivets and Merchant Bars to order, all made exclusively from Andover Iron. The attention of parties who require Iron of the very best quality for special purposes, is respectfully invited.
COOPER & HEWITT,
17 Burling Slip, New York.

February 15, 1850.

Railroad Iron.

THE Undersigned, Agents for Manufacturers, are prepared to contract for the delivery of English, Welsh and Scotch Rails, of any pattern and weight, also for every description of English, Welsh, Scotch, and Swedish Iron, Railway Chairs and Spikes, Rivets, Bolts, Nuts, Washers, Chain Cables, Anchors, Tin Plates, German Spelter, Iron Castings, and every description of Machinery.

WILLIAM BIRD & CO.,

Iron and Tin Plate Merchants,

44 Wall st., New York.

And at 5 Martin's Lane, City, London,
and 140 Buchanan st., Glasgow.

July 27th, 1850.

Glendon Refined Iron.

Round Iron, Band Iron, Hoop Iron,
Square " Flat " Scroll "

Axles, Locomotive Tyres,
Manufactured at the Glendon Mills, East Boston, for
sale by **GEORGE GARDNER & CO.,**
5 Liberty Square, Boston, Mass.

Sept. 15, 1849.

3m37

PATENT HAMMERED RAILROAD, SHIP & BOAT SPIKES.—The Albany Iron Works have always on hand, of their own manufacture, a large assortment of Railroad, Ship and Boat Spikes from 2 to 12 inches in length, and of any form of head. From the excellence of the material always used in their manufacture, and their very general use for railroads and other purposes in this country, the manufacturers have no hesitation in warranting them fully equal to the best spikes in market, both as to quality and appearance. All orders addressed to the subscribers at the works will be promptly executed.

JOHN F. WINSLOW, Agent.

Albany Iron and Nail Works, Troy, N. Y.
The above Spikes may be had at factory prices, of
Erastus Corning & Co. Albany; Merrill & Co., New York; E. Pratt & Brother, Baltimore, Md.

**LAP—WELDED
WROUGHT IRON TUBES**

FOR

TUBULAR BOILERS,

FROM ONE AND A QUARTER TO SEVEN
INCHES IN DIAMETER.

THE ONLY Tubes of the same quality and manufacture as those so extensively used in England, Scotland, France and Germany, for Locomotive, Marine and other Steam Engine Boilers.

THOMAS PROSSER & SON, Patentees,
28 Platt street, New York.

Railroad Iron.

THE UNDERSIGNED ARE PREPARED TO contract for the delivery of English Railroad Iron of favorite brands, during the Spring. They also receive orders for the importation of Pig, Bar, Sheet, etc. Iron.
THOMAS B. SANDS & CO.,
73 New street,
New York.

February 3, 1849.

New York.

Iron Store.

THE Subscribers, having the selling agency of the following named Rolling Mills, viz: Norristown, Rough and Ready, Kensington, Triadelphia, Pottsgrove and Thorndale, can supply Railroad Companies, Merchants and others, at the wholesale mill prices for bars of all sizes, sheets cut to order as large as 56 in. diameter; Railroad Iron, domestic and foreign; Locomotive tire welded to given size; Chairs and Spikes; Iron for shafting, locomotive and general machinery purposes; Cast, Shear, Blister and Spring Steel; Boiler rivets; Copper; Pig iron, etc., etc.

MORRIS, JONES & CO.,

Iron Merchants,

Schuykill 7th and Market Sts., Philadelphia.
August 16, 1849.

ly33

Railroad Iron.

THE MOUNT SAVAGE IRON WORKS, Alleghany county, Maryland, having recently passed into the hands of new proprietors, are now prepared, with increased facilities, to execute orders for any of the various patterns of Railroad Iron. Communications addressed to either of the subscribers will have prompt attention. **J. F. WINSLOW, President**

Troy, N. Y.

ERASTUS CORNING, Albany

WARREN DELANO, Jr., N. Y.

JOHN M. FORBES, Boston.

ENOCH PRATT, Baltimore, Md.

November 6, 1848.

Railroad Iron.

THE SUBSCRIBERS ARE PREPARED TO take orders for Railroad Iron to be made at their Phoenix Iron Works, situated on the Schuykill River, near this city, and at their Safe Harbor Iron Works, situated in Lancaster County, on the Susquehanna river; which two establishments are now turning out upwards of 1800 tons of finished rails per month.

Companies desirous of contracting will be promptly supplied with rails of any required pattern, and of the very best quality.

REEVES, BUCK & CO.

45 North Water St. Philadelphia.

March 15, 1849.

Tredegar Iron Works.

ROLLING MILL FOUNDRY AND MACHINE SHOPS. The undersigned continues to manufacture at his Works in this city (from best charcoal metal) Bar Iron of every description, embracing—
 Rounds and Squares, from $\frac{1}{4}$ to 5 inches diameter.
 Flats, from $\frac{1}{4}$ to 7 inches, all thicknesses.
 Bands and Scrolls, all sizes. Boiler plate and Plough Iron. Railroad and Locomotive Axles and Tires. Locomotive Frames, Spikes and Plates. Hoops, Ovals, Half Ovals, Half Rounds, Angle, T, L, and indeed every description of Iron usually manufactured, all of which he warrants to be equal to any made in this country. He also manufactures at his Foundry and Machine Shops all descriptions of Railroad Work, say, Locomotives, Railroad Wheels and Axles complete and ready for the road, Railroad Chairs, etc. Also, Marine and Stationary Engines all sizes, Sugar mills and Engines, Horse mills, and every kind of Machinery usually required for the operations of the country. He has paid particular attention to getting up machinery, etc., for Gold Mine operations, and those in want of such work might find it to their advantage to give him a call.
J. R. ANDERSON.
 Richmond, Va., Sept. 10, 1850.

CUT NAILS OF BEST QUALITY, BAR IRON (including Flat Rails) manufactured and for sale by
FISHER, MORGAN & CO.,
 75 N. Water St., Philadelphia.

Wheel, Forge and Foundry Iron.

LOCUST GROVE Wheel Iron of great strength and superior chilling property.
 Balt. Charcoal Forge Iron, from Patuxent, Curtis Creek and Gunpowder furnaces.
 Elkridge Foundry Iron, of superior strength and softness. Anthracite and Charcoal Iron from Pennsylvania and Virginia. Gas and Water Pipes, Lamp Posts from Elkridge furnace.
LEMMON & GLENN.
 5m9 62 Buchanan's Wharf, Baltimore.

S. S. Keyser & Co., IRON WAREHOUSE.

Corner of South and Pratt Streets, BALTIMORE, MD.

Selling Agents for the Rough and Ready Bar Iron and Elk Boiler and Flue Iron Rolling Mills, Sarah and Taylor Furnaces, and Wrightsville Hollow Ware Foundry, and Dealers in Bar and Sheet Iron, and Cast, Sheer, German, Blister, Spring and Electroplated Steel, etc., etc.

Smith & Tyson,

GENERAL COMMISSION MERCHANTS,
 No. 25 South Charles St., Baltimore, Md.

AGENTS for the Celebrated Columbia Pig Iron, suitable for Car Wheels and Chilled Rails.
 Columbia refined Charcoal Blooms; Refined Charcoal Juniata Billet Iron for Wire; Refined Iron for Bridging, of great strength; Cut Nails, Spikes, and Brads; Railroad Spikes and Wrought Chairs. 22t

Railroad Iron.

CONTRACTS made by the subscribers, agents for the manufacturers, for the delivery of Railway Iron, at any port in the United States, at fixed prices, and of quality tried and approved for many years, on the oldest railways in this country.

RAYMOND & FULLERTON, 45 Cliff St.

JOHNSON, CAMMELL & Co's Celebrated Cast Steel,

AND ENGINEERING AND MACHINE FILES, which for quality and adaptation to mechanical uses, have been proved superior to any in the United States. Every description of square, octagon, flat and round cast steel, sheet, shovel and railway spring steel, best double and single shear steel, German steel, flat and square, goat stamps, etc. Saw and file steel, and steel to order for any purposes, manufactured at their Cyclops Steel Works Sheffield.

JOHNSON, CAMMELL & CO.,
 100 William St., New York

November 23 1849.

Bowling Tire Bars.

40 Best Flange Bars $5\frac{1}{2} \times 2$ inches, 11 feet long.
 40 " " $5\frac{1}{2} \times 2$ " 7 feet 8 in. long
 40 " Flat " 6×2 " 11 feet long.
 40 " " 6×2 " 7 feet 8 in. long.

Now in store and for sale by

RAYMOND & FULLERTON,
 45 Cliff street.

IRONDALE PIG METAL, MANUFACTURED and for sale by the Bloomsburg Railroad Iron Co.
LINOLEY FISHER, Treasurer.
 75 N. Water St., Philadelphia.

Railroad Iron.

2000 Tons, weighing 58 pounds per lineal yard, of the most approved pattern of T rails, in store and to arrive, for sale by

COLLINS, VOSE & CO.,
 74 South St.

New York, June 1, 1850.

Railroad Iron.

3,000 TONS C. L. MAKE $63\frac{1}{2}$ lbs. per yard, now landing and to arrive.
 Also contracts made for future delivery of above superior make English Iron.

300 Tons Banks Best Iron, Round, Square and Flat.
 200 " English Bar " " " "
 10 " 9-16 Square Iron for Railroad Spikes.

For sale in lots to suit purchasers by
DAVID W. WETMORE.
 New York, March 26, 1850. 3m

WILLIAM JESSOP & SONS' CELEBRATED CAST-STEEL.

The subscribers have on hand, and are constantly receiving from their manufactory,

PARK WORKS, SHEFFIELD,

Double R. fined Cast Steel—square, flat and octagon.
 Best warranted Cast Steel—square, flat and octagon.
 Best double and single Shear Steel—warranted.
 Machinery Steel—round.

Best and 2d gy. Sheet Steel—for saws and other purposes.

German Steel—flat and square, "W. I. & S." "Eagle" and "Goat" stamps.

Genuine "Sykes" L. Blister Steel.
 Best English Blister Steel, etc., etc., etc.

All of which are offered for sale on the most favorable terms by

WM. JESSOP & SONS,
 91 John street, New York.

Also by their Agents—

Curtis & Hand, 47 Commerce street, Philadelphia.
 Alex'r Fullerton & Co., 119 Milk street, Boston.
 Stickney & Beatty, South Charles street, Baltimore.
 May 6, 1848.

Railroad Iron.

B. O. Railway Tires, Railway Wheels,
 Scotch Pig Iron, Tin Plates and Banca Tin,
 Muntz Patent Metal Sheathing,
 Baltimore Copper.

Contracts for Rails made on behalf of the manufacturers, for delivery at any ports in the United States, at fixed prices.

Bowling Tires and Tire Bars and Scotch Pigs imported to order.

Muntz's Ship-sheathing, and a general stock of Tin Plates and Banca Tin in store, and for sale by
RAYMOND & FULLERTON, 45 Cliff St.

Bowling Iron. Stamped B.O.

Railway Tire Bars Rivet Iron
 Locomotive and other Axles Locomotive Frames do
 Boiler Plates Bars.

and every other description of this superior Iron.
 The subscribers, agents for the sale of Bowling Iron, are prepared to execute orders for importation, especially for railway and machinery uses, with despatch from the manufacturers.

RAYMOND & FULLERTON, 45 Cliff St.

Lovegrove's Patent Cast Iron Water and Gas Pipes.

THE Subscriber, the Inventor and Patentee of the Centrifugal mode of giving form to metallic substances while in a molten state, is preparing to make Cast Iron Water and Gas Pipes, of any dimensions, at prices much lower than they can be made in the old manner, and the pipes warranted to stand a pressure of three hundred pounds to the square inch, and to be soft enough to drill. Steam Engines and all kinds of machinery. Cast Iron Doors and Frames, and Mill Castings of every description, made to order.

THOMAS J. LOVEGROVE,

Machinist and Founder,
 West Falls Avenue, below Pratt St., Baltimore.

Railroad Iron.**SPIKES.**

Wrought Iron CHAIRS, New Pattern.

THE Undersigned continues to contract, as usual, for the above articles. The reputation already acquired for their excellent quality is a guarantee that strict attention shall continue to be paid to the wants and interests of purchasers.

CHARLES ILLIUS,
 20 Beaver St., New York.

Ray's Patent India Rubber Car Springs.

Savannah, Ga., May 22, 1850.

FOWLER M. RAY, Esq.,
 Dear Sir: I have no hesitation in saying, after having used on our road your springs and Fuller's, that I consider yours decidedly the best in every particular, and in this opinion I am sustained by all our officers. Fuller's spring has a tendency to split, and also to chafe or abrade by the constant friction on the cast iron plates or disc: and in my opinion is not near so elastic as yours.

Your springs, which have been in use on our road for 12 or 15 months past, and in constant use under both passenger and freight cars, are to all appearances aelastic, sound and good, as when first put in use.

We are now building eighty-five new cars, of which for fifty-sets the springs have been ordered of you.

GEORGE A. ADAMS,

Master Carpenter,

Central Railroad and Banking Co. of Georgia.

Connecticut River Railroad Office, }
 Northampton, May 4, 1850. }

E. CRANE, Esq.,

Dear Sir: It is now about two years since I first tried the experiment of using a set of Ray's India-rubber Springs upon one of our merchandise cars, and although the car has been in constant service since that time, I do not on examination find the slightest difference either in the thickness or elasticity of the material.

The same result has followed wherever we have applied them, either for wheel or draw springs on Engines, Tenders or Cars. At present we use no other; either in replacing old springs or building new cars—and I am perfectly satisfied that for economy, durability, safety, and ease of motion, that Ray's India-rubber is the best article for Springs which has been presented to the public.

Yours respectfully, **J. HUNT,**
 Supt. Connecticut River Railroad.

EDWARD CRANE, Esq.,

Dear Sir: Having applied to cars of the Boston and Worcester Railroad Corporation, Ray's Vulcanised Rubber Springs (where they have been in use for some two years last past), I have had occasion to observe their operation, and am free to say in answer to your inquiries, that they retain their elasticity perfectly during all changes of atmospheric temperature: and are in my opinion a most valuable acquisition to Railroad Cars—are not liable to derangement, as is the case with steel springs; while at the same time it costs less to apply them. Respectfully yours,

D. N. PICKERING,
 Supt. Motive Power, Bos. & Wor. Railroad.
 Boston, April 15th, 1850.

EMERSON'S**PATENT****CORRESPONDING VENTILATORS,**

For Ships, Steamers, etc.,

Manufactured by

CHILSON, ALLEN, WALKER & CO.,
 351 Broadway, New York.

TO RAILROAD COMPANIES, CAR MANUFACTURERS, etc.

THE Undersigned hereby gives public notice, that the Commissioner of Patents, pursuant to his decision in relation thereto, on the 8th day of October, 1850, issued to him a Patent for the sole right to manufacture, and exclusive use of the **INDIA RUBBER CAR SPRING**, on account of priority of invention of said Spring.
F. M. RAY
 New York, Oct. 23, 1850.

RAILROAD CAR MANUFACTORY

TRACY & FALES,

GROVE WORKS, HARTFORD, CONN.

Passage, Freight and all descriptions of

RAILROAD CARS,

AS WELL AS

LOCOMOTIVE TENDERS.

Made to order promptly.

The above is the Largest Car Factory in the Union. In quality of Material, and in Workmanship, Beauty and Good Taste, as well as Strength and Durability, we are determined our work shall be unsurpassed.

JOHN R. TRACY. THOS. J. FALES.

Monument Foundry.

A. & W. DENMEAD & SON.
Corner of North and Monument Sts.,—Baltimore,
HAVING THEIR

IRON FOUNDRY AND MACHINE SHOP

In complete operation, are prepared to execute faithfully and promptly, orders for Locomotive or Stationary Steam Engines, Woolen, Cotton, Flour, Rice, Sugar Grist, or Saw Mills,

Slide, Hand or Chuck Lathes, Machinery for cutting all kinds of Gearing, Hydraulic, Tobacco and other Presses, Car and Locomotive patent Ring Wheels, warranted,

Bridge and Mill Castings of every description, Gas and Water Pipes of all sizes, warranted, Railroad Wheels with best fagotted axle, furnished and fitted up for use, complete

Being provided with Heavy Lathes for Boring and Turning Screws, Cylinders, etc., we can furnish them of any pitch, length or pattern.

Old Machinery Renewed or Repaired—and Estimates for Work in any part of the United States furnished at short notice.

June 8, 1849.

RAILROAD CAR AND COACH TRIMMINGS.

Doremus & Nixon,
IMPORTERS AND FURNISHERS

HAVE FOR SALE

Plain Garnet Plush. Fig. Garnet Plush (Butterfly pat.
"Crimson " "Crimson " (Elegant.
"Scarlet " " " " (Gen. Taylor.

BROCATELLES.

Crimson Silk Brocatelles. Gold and Maroon do.
Gold and Blue " " Brown "
Silk and Wool " of every color.

MOQUETTES.

Of elegant designs and colors.

GERMAN CLOTH FOR CAR LININGS.

The most beautiful goods ever shown in this country, and the subscribers are the sole agents for the sale of them.

Oil cloths Enamelled with Gold. These goods can be
" " Silver. furnished in any
Do. Silver ground velvet printed. dimensions req'd.

CURLED HAIR

Of every description and quality.

JNO. W. A. STRICKLAND, Agent.
New York, 1850. 1916

FOWLER M. RAY'S Patent India-rubber Railroad CAR SPRING.

New York and Erie Railroad Shops,
Piermont, March 26, 1850.

This will certify that from practical experience in the use of Fowler M. Ray's India rubber Car Springs, I believe them to be far superior to any others now in use.

I have never known them to be affected by any change of temperature, as other Rubber Springs have been affected on this road.

I am at the present time repairing a Passenger Car that Mr. Ray and myself mounted with his springs about two years and eight months since.

The springs are at the present time as perfect, to all appearances, as when first applied to the car.

Respectfully yours,

HORACE B. GARDNER,
Foreman of the Car Shops.

Supt. Office N.Y. & H. R.R.,
New York, March 8, 1850.

This is to certify that we have used the Rubber Springs manufactured by Mr. F. M. Ray for the past twenty months, "both for Passenger and Freight Car Springs and Bumpers, and of different sizes," and have in every case given entire satisfaction, and I consider them the best spring now in use.

M. SLOAT, Supt.

Boston, March 5, 1850.

In answer to your enquiry about India-rubber Springs, I have to say that we have used them to a considerable extent on both freight and passenger cars, and also on several of our tenders; and I am very well satisfied that they answer all the purposes for which they are intended. I believe the India-rubber will soon supersede all other springs for cars and tenders.

Yours truly,
S. M. FELTON,
Supt. Fitchburg Railroad.

Office New Jersey Railroad Co.,
Jersey City, March 8, 1850.

FOWLER M. RAY, Esq.,

Dear Sir: In answer to your enquiries respecting the operation of the Vulcanised Rubber Springs, purchased by our company from you some two years since, I reply that they are superior to any spring in use, (that I have either seen or heard of).

The improved form of your spring, consisting of a solid piece of vulcanised rubber with bands on the outside, is far superior to your first form, consisting of disks of rubber with metallic plates interposed.

The last named form was tried, if you recollect, at a much earlier period; and then was replaced by your last form.

I have no hesitation in saying that your springs have given entire satisfaction, and most cheerfully recommend them to railroad companies throughout the country for the following reasons:

1st. The cost is 30 per cent. less.
2d. Saving of weight on each car of 8 wheels from 700 to 800 lbs.

3d. Less care and attention is required, as they are not liable to get out of repair.

4th. A great saving is secured in the wear and tear of the cars and rails from their great elasticity.

5th. The freedom from noise.

6th. There is greater safety in case of accident, as they cannot be broken.

7th. The comfort of passengers is enhanced sufficiently to pay the expense, waiving all the other reasons that I have given.

Should this fail to satisfy any person enquiring, you are at liberty to refer to me, No. 150 Washington St., Jersey City.

Yours respectfully,

T. L. SMITH, Supt.

New York, March 11, 1850.

I have used the Patent India-rubber Spring purchased of Mr. Ray, upon the cars of the New York and New Haven Railroad, and have found them efficient and economical; and when applied to the axles and draw springs, believe them to be quite equal to any in use. I have found a combination of these springs with a steel spring under the transom beam a very satisfactory arrangement, and am now using this plan in all new cars.

Yours respectfully,

ROBERT SCHUYLER.

February 25, 1850.

From practical observation of the use of the India-rubber Car Springs, manufactured and sold by your company, we are entirely satisfied in their application, and do not hesitate to recommend them as elastic, durable, requiring no repairs for years, and retaining their consistency during all extremes of weather. We have applied them for the past two years, and consider them superior for all railroad purposes.

Yours truly,

OSGOOD BRADLEY, Car Builder, Worcester.
T. & C. WASON, do. Springfield.
DEAN, PACKARD & MILLS, do. do.
DAVENPORT & BRIDGES, do. Cambridgeport.

Office of the New Jersey Railroad Co.,
Jersey City, March 7, 1850.

This is to certify that we have had Mr. F. M. Ray's India-rubber Springs in constant use under our cars, and as Bumper Springs for upwards of two years, and they have in every way given perfect satisfaction.

The present form of spring we deem far superior to the form of Disk, having used both forms, although we have none of those made in Disks at present in use.

We take pleasure in recommending these springs to all railroad companies.

J. P. JACKSON, Vice Pres.
New Jersey Railroad and Trans. Co.

Roxbury, February 28, 1850.

In compliance with your request, I take great pleasure in stating the result of my experience in the use of "Ray's Patented Vulcanised India-rubber Car and Engine Springs." We have used them nearly two years, and never had one fail in any way. The cold weather does not affect them, as it has other rubber springs we have used.

With sixteen years' experience as superintendent of machinery on the Boston and Providence railroad, I take pleasure in saying that your springs are the best we ever used, or I ever saw used elsewhere. We have 20 cars rigged with them, of which I can say that the springs are as good now as when first applied. I put 24 lbs. of the rubber under the forward end of one of our heaviest engines, taking off 250 lbs. of steel springs—it has been in use 18 months, and is in as good condition now as when first put under the engine.

Very respectfully yours,

GEO. S. GRIGGS,
Supt. of Machinery, Boston and Prov. R.R.

Fall River, February 2, 1850.

In answer to yours of the 20th ult. I would say that this company has for some 10 or 12 months past been using "Ray's India-rubber Springs." We have applied them to both passenger and freight cars with uniform success. They have invariably preserved their elasticity and consistency through all the extremes of weather; and we are now applying them whenever the steel spring fails. I am well satisfied that they are particularly adapted for railroad purposes.

Very respectfully yours,

GEO. HAVEN,
Supt. Fall River Railroad.

Jersey City, March 9, 1850.

This is to certify that the present form of Mr. F. M. Ray's India-rubber Car Spring I consider far superior to the form of Disk, having used both forms.

I take pleasure in recommending these springs to all railroad companies.

DAVID H. BAKER,
Foreman of Car Shop of N.J. R.R. & Trans. Co.

Harlem R.R. Depot,
New York, March 7, 1850.

This is to certify that we have used Mr. F. M. Ray's India-rubber Springs for over eighteen months, and find them to be easy and durable, and recommend them to railroad companies as being superior to anything we have tried.

J. M. SMART,

Foreman at 42d St. Depot.

Old Colony Railroad Office,
Boston, March 6, 1850.

EDWARD CRANE, Esq.,

President New England Car Co.,

Dear Sir: In compliance with your request I would state that the Old Colony Railroad Compy have had in use upon their road, India-rubber Springs furnished by your company, for more than eighteen months past, during which time they have been extensively used under Passenger and Freight Cars, Locomotive Tenders, and for Drawer and Buffering Springs, with the most perfect success. The elasticity and consistency of the Rubber has never been unfavorably affected by either extremes of heat or cold—and from the experience which we have had in the use of Rubber Springs, I think them well adapted for railroad purposes—and therefore we have for some months past used Rubber almost exclusively, in all places where springs are required.

Respectfully yours, etc.,

JAS. H. MOORE,
Supt. O. C. Road.

Troy, February 27, 1850.

We have been using your India-rubber Car Springs for nearly two years—and we take pleasure in saying that in our opinion the rubber has to a certain extent already, and may eventually entirely supersede all other Springs for Railroad Car purposes. We now use it entirely for Draw Springs and Bumpers, considering it better and lighter than steel.

During our two years' experience in the use of it, we have not known any to lose their elasticity, or fail in any way; and we cheerfully recommend the rubber for railroad car springs.

Very respectfully,
EATON, GILBERT & CO.

Passenger Car Linings.

THE Advertiser continues to make to order the Enamelled Car Linings which have been so highly approved the last three years, and are now exclusively used by all the Northern Railroads. No pains are spared to get out new styles, and adapt them to the tastes of every consumer.

Orders addressed to **CHARLES STODDER,** No. 75 Kilby street, Boston, will have prompt attention.
March 23, 1850. 2m

India-rubber for Railroad Co.

RUBBER SPRINGS—Bearing and Buffer—Pulley's Patent—Hose from 1 to 12 inches diameter. Suction Hose. Steam Packing—from 1-16 to 2 in. thick. Rubber and Gutta Percha Bands. These articles are all warranted to give satisfaction, made under Tyer & Helm's patent, issued January, 1849.—No lead used in the composition. Will stand much higher heat than that called "Goodyear's," and is in all respects better than any in use. Proprietors of railroads do not be overcharged by pretenders.

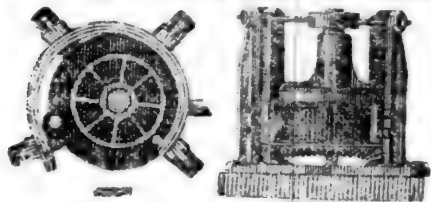
HORACE H. DAY,

Warehouse 23 Courtlandt street,

New York, May 21, 1849.

Spikes, Spikes, Spikes.

ANY person wishing a simple and effective Spike Machine, or a number of them, may be supplied by addressing
J. W. FLACK,
Troy, N. Y.
March 6, 1850.

MACHINERY.**Henry Burden's Patent Revolving Shingling Machine.**

THE Subscriber having recently purchased the right of this machine for the United States, now offers to make transfers of the right to run said machine, or sell to those who may be desirous to purchase the right for one or more of the States.

This machine is now in successful operation in ten or twelve iron works in and about the vicinity of Pittsburgh, also at Phoenixville and Reading, Pa., Covington Iron Works, Md., Troy Rolling Mills, and Troy Iron and Nail Factory, Troy, N. Y., where it has given universal satisfaction.

Its advantages over the ordinary Forge Hammer are numerous: considerable saving in first cost; saving in power; the entire saving of shingler's, or hammerman's wages, as no attendance whatever is necessary, it being entirely self-acting; saving in time from the quantity of work done, as one machine is capable of working the iron from sixty puddling furnaces; saving of waste, as nothing but the scoria is thrown off, and that most effectually; saving of staffs, as none are used or required. The time required to furnish a bloom being only about six seconds, the scoria has no time to set, consequently is got rid of much easier than when allowed to congeal as under the hammer. The iron being discharged from the machine so hot, rolls better and is much easier on the rollers and machinery. The bars roll sounder, and are much better finished. The subscriber feels confident that persons who will examine for themselves the machinery in operation, will find it possesses more advantages than have been enumerated. For further particulars address the subscriber at Troy, N. Y. **P. A. BURDEN.**

Railroad Spikes and Wrought Iron Fastenings.

THE TROY IRON AND NAIL FACTORY, exclusive owner of all Henry Burden's Patented Machinery for making Spikes, have facilities for manufacturing large quantities upon short notice, and of a quality unsurpassed.

Wrought Iron Chairs, Clamps, Keys and Bolts for Railroad fastenings, also made to order. A full assortment of Ship and Boat Spikes always on hand.

All orders addressed to the Agent at the Factory will receive immediate attention.

P. A. BURDEN, Agent,
Troy Iron and Nail Factory, Troy, N. Y.

CHILLED RAILROAD WHEELS.—THE UNDERSIGNED are now prepared to manufacture their Improved Corrugated Car Wheels, or Wheels with any form of spokes or discs, by a new process which prevents all strain on the metal, such as is produced in all other chilled wheels, by the manner of casting and cooling. By this new method of manufacture, the hubs of all kinds of wheels may be made whole—that is, without dividing them into sections—thus rendering the expense of banding unnecessary; and the wheels subjected to this process will be much stronger than those of the same size and weight, when made in the ordinary way.

A. WHITNEY & SON,
Willow St., below 13th,
Philadelphia, Pa.

Brown's Old Established SCALE WARE HOUSE,
NO. 234 WATER ST., NEW YORK.

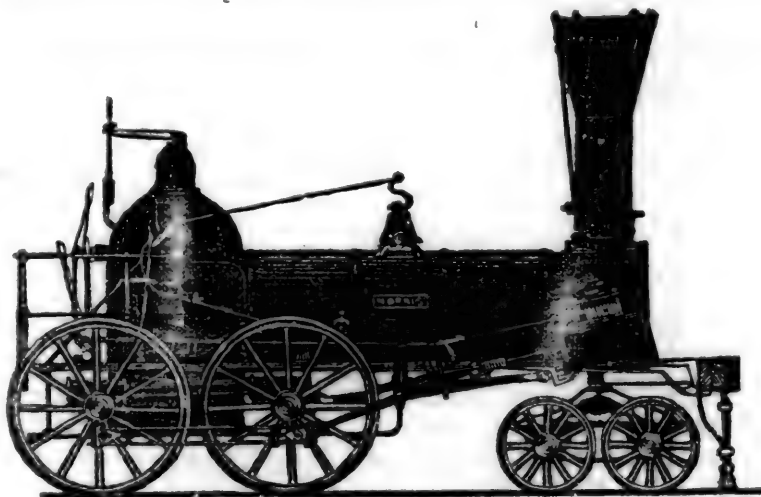
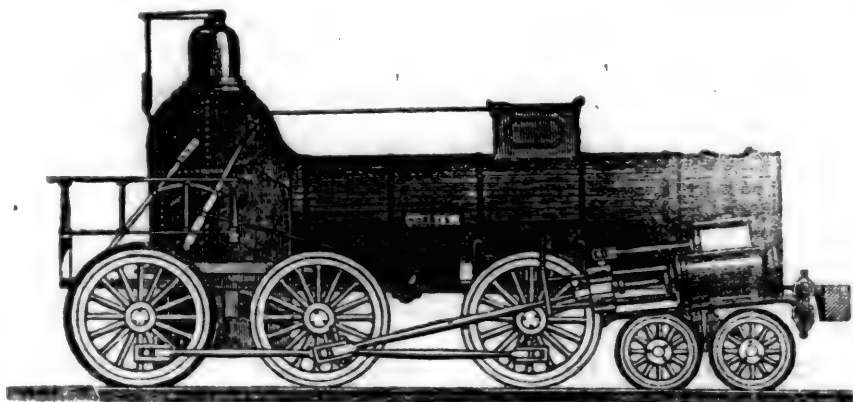
THE Subscriber Practical Manufacturer of Scales of every description, respectfully asks the attention of Railroad Companies to his Improved Wrought Iron Railroad Track and Depot Scales which for strength, durability, accuracy, convenience in weighing, and beauty of workmanship, are not surpassed by any others in this country.

He is aware that this is rather a bold assertion for him to make, yet he can say with confidence that they have but to be tried to give them precedence over all others.

J. L. BROWN.

Bank Scales made to order, and all Scales of his make warranted in every particular.

References given if required

NORRIS' LOCOMOTIVE WORKS.
BUSHHILL, SCHUYLKILL SIXTH-ST., PHILADELPHIA,

THE UNDERSIGNED Manufacture to order Locomotive Steam Engines of any plan or size. Their shops being enlarged, and their arrangements considerably extended to facilitate the speedy execution of work in this branch, they can offer to Railway Companies unusual advantages for prompt delivery of Machinery of superior workmanship and finish.

Connected with the Locomotive business, they are also prepared to furnish, at short notice, Chilled Wheels for Cars of superior quality.

Wrought Iron Tyres made of any required size—the exact diameter of the Wheel Centre, being given, the Tyres are made to fit on same without the necessity of turning out inside.

Iron and Brass castings, Axles, etc., fitted up complete with Trucks or otherwise.

NORRIS, BROTHERS

PATENT MACHINE MADE HORSE-SHOES.

The Troy Iron and Nail Factory have always on hand a general assortment of Horse Shoes, made from Refined American Iron.

Four sizes being made, it will be well for those ordering to remember that the size of the shoe increases as the numbers—No. 1 being the smallest.

P. A. BURDEN, Agent,
Troy Iron and Nail Factory, Troy, N. Y.

Etna Safety Fuse.

THIS superior article for igniting the charge in wet or dry blasting, made with DUPONT'S best powder, is kept for sale at the office and depot of

REYNOLDS & BROTHER,

Manufacturers,
No. 85 Liberty St.
NEW YORK.

And in the principal cities and towns in the U. States.

The Premium of the AMERICAN INSTITUTE was awarded to the Etna Safety Fuse at the late Fair held in this city.

November 3, 1849.

17

COLUMBUS, OHIO,
Railroad Car Manufactory.
RIDGWAYS & KIMBALL,

HAVE established at this central point, the manufacture of Passenger, Freight, Gravel and Hand Cars for Railroads, and assure all Western Railroad Companies that it will be their constant aim to procure the best materials and workmen, and to turn out the best kind of work at fair prices. Specimens may be seen on the Columbus and Xenia Railroad. The patronage of Railroad Companies is respectfully solicited.

178

FOR SALE.

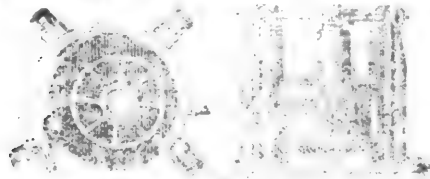
THREE LOCOMOTIVES, Manufactured by M. W. Baldwin, of 10 tons weight, all in complete repair, and now running on the Columbia and Philadelphia Railroad.

For particulars apply to A. L. Roumfort, Supt. of said road, either at Philadelphia, or Parkersburg, Chester county.

A. L. ROUMFORT,
Supt. Motive Power Col. & Philad. R.R.

MACHINERY.

Henry Burden's Patent Revolving Shingling Machine.



With Subscriber having recently purchased the right of this machine for the United States, now offers to make transfers of the right to run said machine, or sell to those who may be desirous to purchase the right for one or more of the States.

This machine is now in successful operation in ten or twelve iron works in and about the State of Pennsylvania, also at Piquetteville and Reading, Pa.; Covington Iron Works, Md.; Troy R. Co. Works, N. Y.; and the Iron and Nail Factory, Troy, N. Y., where it has given universal satisfaction.

Its advantages over the ordinary Forge Hammer, are numerous: considerable saving in fuel cost; saving in power; the entire saving of shinglers, or hammer men's wages, as no attendance whatever is necessary, it being entirely self-acting; saving in time from the quantity of work done, as one machine is capable of working the iron from sixty puddling furnaces; saving of waste, as nothing but the scoria is thrown off, and that most effectually; saving of staffs, as none are used or required. The time required to furnish a bloom being only about six seconds, the scoria has no time to set, consequently is got rid of much easier than when allowed to congeal as under the hammer. The iron being discharged from the machine so hot, rolls better and is much easier on the rollers and machinery. The bars roll sounder, and are much better finished. The subscriber feels confident that persons who will examine for themselves the machinery in operation, will find it possesses more advantages than have been enumerated. For further particulars address the subscriber at Troy, N. Y. P. A. BURDEN.

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P. A. BURDEN, Agent,
Troy Iron and Nail Factory, Troy, N. Y.

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A. WHITNEY & SON,
Willow St., below 14th,
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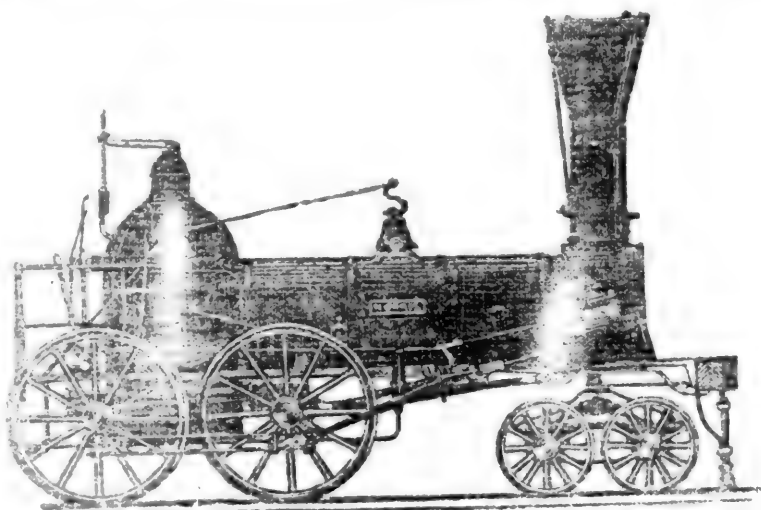
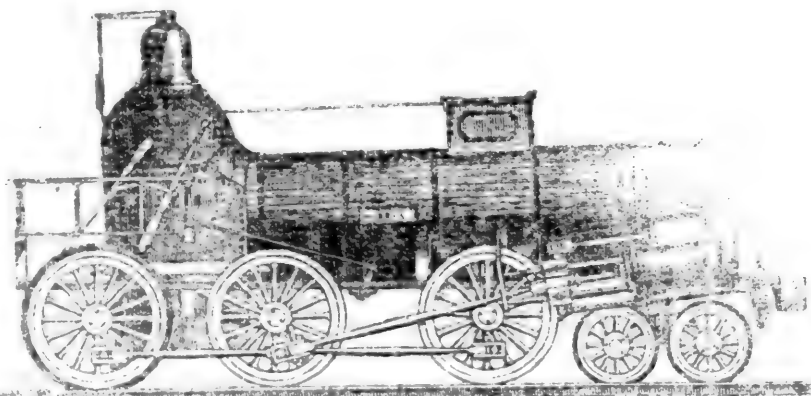
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RUSHHILL, SCHUYLKILL SIXTH-ST., PHILADELPHIA.



THE UNDERSIGNED are prepared to order Locomotive Steam Engines of any plan or size, for or ships being engaged, and their arrangements considerably extended to facilitate the speedy delivery of work in this branch, they can offer to Railway Companies unusual advantages for prompt delivery of Machinery of special workmanship and finish.

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